

# Hospitals & Asylums

Land and Water HA-6-1-18, HA-11-1-18

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## **Introduction**

The U.S. has 2.3 billion acres of land. Only 66 million acres are considered developed lands. This amounts to 3 percent of the land area in the U.S., yet this small land base is home to 75 percent of the population. Developed and rural residential make up 139 million acres, or 6.1 percent of total land area in the U.S. About 349 million acres in the U.S. are planted for crops. Some 788 million acres, or 41.4 percent of the U. S. excluding Alaska, are grazed by livestock. Forest lands comprise 747 million acres. Natural Resources Council of Maine reports that of the 2,263 million acres of land in the United States, 786 million acres are federal and state land combined (34.7 %), 588 million acres of federal land (26.0%) and 198 million acres of state land (8.7%). There are another 1.5 million acres of city parks. The Interior Department (ID) holds a total of 486 million acres – 55 million acres Bureau of Indian Affairs (BIA), 247 million acres Bureau of Land Management (BLM), 6.6 million acres Bureau of Reclamation, 90 million acres Fish and Wildlife Service (FWS), and 87 million acres National Park Service - 268 million with 181 million acres of National Forests slashed and burned by the United States Department of Agriculture (USDA) Forest Service (FS). The Department of Defense (DoD) holds 30 million acres, US Army Corp of Engineers 7.8 million acres. The federal government owns a total of 649 million acres, not including 55 million acres held by tribal governments. States own 180 million acres. Cities own more than 1.5 million acres. A total of 904 million acres of public land are owned by federal, state, city, and tribal governments in the United States. 109 million acres of federal land are protected by the Wilderness Preservation System under 16USC§1131.

\$140 billion FY 18 is more than enough to pay for USDA outlays of \$124 billion or \$128 billion if the President wants to stop obstructing the 3% annual food stamp program spending growth. \$140 billion leaves the USDA with a comfortable margin of \$16 billion or \$12.4 billion undistributed offsetting receipts, respectively. The unexplained lower cost estimates of the President regarding USDA outlays are justified by the fact that, the Commodity Credit Corporation (CCC) and Rural Business Cooperative (RBC) are financed by off-budget congressional budget authority, interest on farm loans and electricity revenues, respectively, and should not be accounted for in the USDA outlay table. In FY 19, after FY 18 FS park dues, total USDA outlays, 2.75% more than FY 18, without the FS, are estimated to be \$138.4 billion FY 19. Un-re-certified, at current 2.7% average annual rate of consumer price inflation, the SNAP grocery subsidy for the poor should grow every year 3% = % benefit amount + % new beneficiaries. After the 2017 fire season it is held that all +/- 33,000 Forest Service employees and noxious contractors must be completely fired for poison hemlock, leaches, fleas, ticks, Lyme, rabies and arson within the special maritime and territorial jurisdiction under 18USC§81, with disability retirement under 5USC§8337. The remainder of the \$5.3 billion FY 18 FS budget must be distributed under saw moratorium so that all National Forest and urban forest interface slash piles are chucked and thickets chipped by National, State, County and City Park supervision under 54USC§100101 *et seq* to improve quality of life and reduce risk of catastrophic forest fire under 36CFR§261.5 posed by the Agriculture Secretary under 16USC§551.

Interior's FY 18 budget request is reported to be \$11.7 billion in current authority, \$1.6 billion or 12 percent below the 2017 CR baseline level. \$11.7 billion is however \$3.1 billion more than total costs for normal 2.5% agency spending growth FY 17-FY18. President's FY 18 Interior budget goes down from \$13.3 billion FY 17 to \$11.7 billion, FY 18. The Interior Secretary wants to reduce budget authority from \$19 billion FY 17 to \$18 billion FY 18 while revenues increase from \$10.7 FY 17 to \$11.2 billion FY18 for total outlays declining from \$8.5 billion to \$6.8 billion, leaving \$4.9 billion undistributed offsetting receipts. Interior 2.5% growth to FY 18 is estimated to \$19.8 billion budget authority minus \$11.2 billion revenues, for total outlays of \$8.6 billion, minus federal outlays of \$11.7 billion equals. \$3.1 billion undistributed offsetting receipts. Trump's national monument grab must be limited to the occupationally and recreationally safe national interest of mining to swimming hole contracts in Utah under 43USC§1701(12) and impeached from the fo-rest for Conspiracy Art. 81 Uniform Code of Military Justice (UCMJ) 10USC§881, Art. 104 UCMJ Aiding the Enemy 10USC§904 and Obstruction of Justice Rule 96 (Art. 134) of the Manual for Courts-Martial. Public lands are to be retained in Federal ownership, unless as a result of the land use planning procedure, it is determined that disposal of a particular' parcel will serve the national interest under 43USC§1701(1)(2) and (12) to promote the Mining and Minerals Policy Act of 1970 under 30USC§21a. Freehold or leasehold interests in national parks and monuments of scientific significance are prohibited under 54USC§102901(a). Title 54, National Park Service and Related Programs was made law by Pub. L. 113-287, §6(e) on Dec. 19, 2014, 128 Stat. 3272. Although authenticated by a split ticket and practice, the 2014 bill was sneak enacted, leaving a memory of obstructed *Forestry*, but Chapter 1 National Parks of Title 16 Conservation was mostly repealed. To suppress terrorism Trump is challenged to settle the Presidential duel between Bush and Obama regarding the right to bear arms under 16USC§1a-7b that must either be repealed or transferred, with Trump's opinion on lawful hunts in the National Wildlife Refuge system, to the Chapter on Obstruction of Lawful Hunt 16USC§5201 *et seq* with reference to Obstruction of Justice Rule 96 (Art. 134) of the Manual for Courts-Martial.

## **Art. 1 Agriculture**

## **§1 Food and Agriculture Organization**

A. An estimated \$15.79 trillion of the \$78.95 trillion Gross World Product (GWP) was spent on food in 2011. World food production value for the export market in 2014 was estimated at \$2.3 trillion, about 4% of the GWP. \$945 billion in food was exported and \$967 billion was imported. Since 2008, more people live in cities than in rural areas. Of the 7.2 billion population 3.4 billion were rural and 2.8 billion hectares were harvested. An average of 2,900 kcal per capita are produced for 123% dietary adequacy, 117% in Africa, 120% in Asia, 129% in Latin America and the Caribbean, 114% in Oceania. The GDP per capita is \$13,915. Worldwide 30.7% of the population is employed in agriculture. About 10.8% of the population are undernourished. Domestic food price volatility is estimated at 7.8%. The cereal import dependency ratio is 50.7%. 88.7% have access to an improved water source. 32% of land is forested.

B. The Food and Agriculture Organization (FAO) was created in 1945 by the United Nations. In 1951 FAO headquarters moved to Rome, Italy from Washington D.C. Since the first steps were taken in 1961 to establish a Codex Alimentarius, the Codex Alimentarius Commission has drawn world attention to the field of food quality and safety. Now, for almost 50 years, all aspects of food pertaining to the protection of consumer health and fair practices in the food trade have come under the Commission's scrutiny. The first World Food Day observed on 16 October 1981 by more than 150 countries. AGROSTAT (now FAOSTAT), the world's most comprehensive source of agricultural information and statistics, becomes operational in 1986. The Code of Conduct for Responsible Fisheries was adopted in October 1995 to provide a necessary framework for national and international efforts to ensure sustainable exploitation of aquatic living resources in harmony with the environment. The International Plant Protection Convention entered into force in 1997 with 92 signatories. The FAO adopted the 1998 Rotterdam Convention on Prior Informed Consent to regulate the trade in pesticides and other hazardous chemicals. An FAO Conference adopts the legally binding 2001 International Treaty on Plant Genetic Resources for Food and Agriculture, which supports the work of breeders and farmers everywhere. In 2002 the Council of FAO unanimously adopts the Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security (Right to Food Guidelines) and reaffirmed the international community's commitment to reduce the number of the undernourished by half by 2015. The Committee on World Food Security (CFS) endorsed the new Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security on 11 May 2012. In 2014, the FAO endorsed the Rome Declaration on Nutrition that enshrines the right of everyone to have access to safe, sufficient and nutritious food, and commits governments to prevent malnutrition in all its forms. The Framework of Action recognizes that governments have the primary role and responsibility for addressing nutrition issues and challenges.

1. The United States and Canada do not seem to participate in FAO statistics. The Food and Agriculture Organization (FAO) was created by the United Nations in 1945. Although North America is reported to be less soaked in pesticides than Europe North American agriculture seems to be at odds with the Biosafety Protocol to the Convention on Biological Diversity pertaining to the international sale of crops contaminated with detectable patented transgenic genetically modified organisms. It would be nice if the United States and Canada were included in the Food and Agriculture Organization Statistical Pocketbook most recently published in Rome 2015. The United States must agree to the language of the 1992 Convention on Biological Diversity and its 2000 Biosafety and 2010 Redress

Protocols and subsidize transitions of large farms to certified organic agriculture so that they don't make good on their threats to use more herbicide if they can't use genetically engineers crops.

C. Agriculture arose roughly ten thousand years ago and its expansion was the dominant force of ecological change over most of the Holocene, the relatively warm and stable geological epoch from the end of the last ice age that began around twelve thousand years ago. Agricultural surpluses enabled 10% of the population to live in cities around 6,000 B.C. who learned war. Food forests were slashed and burned and the population became increasingly reliant upon agricultural commodities that regrow in one year. The Industrial Revolution enabled 50% of the population to live in cities and today 80% of Americans live in the city and since 2008 the majority of people around the world live in cities. Agriculture has two properties that distinguish its role in the economy from industry and services. The first is that demand for agricultural output does not increase in proportion with income. We say that the income elasticity for food demand is less than one: food demand increases with income, but much less than proportionately. Food is a “necessity”, not a luxury good. This means that as economic development takes place, agriculture will not keep pace as a share of the total economy. The second property is that agriculture is land dependent, while industry and services are not. Farmers need and more than they need close neighbors. On the other hand, service providers such as barbers, doctors, lawyers, bankers and movie theater operators need customers and neighbors more than they need large open spaces. Farmers need to live in sparsely settled areas, with lots of land per person, while industrial and service workers need to live in crowded areas, close to suppliers and buyers. Agriculture is rural, while industry and services are intrinsically urban.

1. Food trade cannot be treated as just another exchange of goods, and food cannot be treated as just another commodity. Full development of the concept of the right to food, and its embrace by all governments, will be need to ensure that the flow of food is never interrupted. The FAO advanced this concept in 2004 with the adoption of the right to Food Guidelines, and at least 28 nations have an explicit right to food in their national constitutions. Codifying a right to food in international trade agreements so that, for example, food cannot be withheld for political reasons, may be required. In sum, conserving the very base of food production – the land, water and climate that make crop growth possible – is essential to ensure that the world’s farmers continue to produce enough food for everyone. When resources already are scarce, reservoirs of food can be tapped for broader distribution and utilization. And political assurances guaranteeing that agricultural plenty is not blocked form dinner tables worldwide can ensure that food attains a sacred status in a globalized world. In these ways, a world under growing resource pressure can continue to ensure that food is available for all.

2. The Food and Agriculture (FAO) of the UN projects that global agricultural demand in 2050 will be 60 percent higher than the three-year average for 2005—07. Global agricultural production has grown 2.5-3 times over the past century and can rightly be described as cornucopian, with enough food produced to feed the entire human family. As demand for agricultural products grew by 2.2 percent per year between 1961 and 2007, the extent of arable land grew much more slowly – just 14 percent for the entire period. To meet demand, farmers intensified production, using mechanization, chemical fertilizer (in place of manure), new seed varieties, irrigation, and other advances to coax more from each hectare of land. Yet rates of growth of agricultural production are only half the 3 percent annual rate seen in developing countries in the past. The number of countries depend on grain imports (defined as importing 25 percent of more of domestic consumption) grew 57 percent between 1961 and 2013, to 77 nations – more than a third of the world’s countries. Among developing countries, dependence on grain imports is greater than 50 percent in Central America, where land is relatively scarce, and in the

Middle East and North Africa, where water is the chief constraint. Sub-Saharan Africa imports about 20 percent of its grain, and the low and middle-income nations of Asia import about 7 percent. Japan, with the wealth to outbid other nations in international markets, imports about 70 percent of its grain.

3. With 7.2 billion people on the planet and with the global population continuing to grow by around 75 million people per year, the challenge of feeding the planet is with us again. Malnutrition is a pervasive problem: around 40 percent of the world's population is malnourished in one way or another. The Food and Agriculture (FAO) defines chronic hunger as the insufficient intake of energy (calories) and proteins. Hundreds of millions of people are afflicted by chronic hunger and have only the energy for mere survival. The FAO estimated 870 million people for the years 2010-2012. There is also hidden hunger, or micronutrient insufficiency. The calories and proteins may be sufficient, but the micronutrients like vitamins or particular fatty acids are not adequately present in the diet. Key micronutrient deficiencies prevalent in many low-income countries include vitamin A, vitamin B12, zinc, iron, folate, omega-3 fatty acids, and iodine. The third kind of malnutrition, which is now at epidemic proportions in many parts of the world, especially the richest countries, is the excessive intake of calories leading to obesity, meaning weight is far too high for height. It is estimated that roughly one-third of all adults in the world are overweight, and around 10-15 percent are obese. Adding it all up, around 900 million people are chronically hungry. Perhaps another 1 billion more have enough macronutrients (calories and proteins) but suffer from one or more micronutrient deficiencies. Roughly 1 billion more are obese. In total, around 3 billion people are malnourished out of a world population of 7.2 billion people, meaning that a staggering 40 percent of the world is malnourished. Chronic hunger is heavily concentrated in tropical Africa and in South Asia. More than one-third of the population in tropical Africa, especially central and southern Africa, is undernourished. In South Asia, between 20 and 33 percent of the population is chronically undernourished.

4. Chronic undernourishment of young children is measured according to various indicators of severity. The first is stunting. Stunting means that a child has a very low height for his or her age. Specifically, children are assessed relative to a standard population distribution of height for age. Children who are more than two standard deviations below the norm are considered stunted. The second condition is even more urgent, and that is wasting – low weight for height. Wasting is often a sign of acute, life-threatening undernutrition, of the kind one often sees in a famine. Children may require high intensity nutritional foods designed to combat acute undernutrition and emergency procedures to help keep the children alive. There is a key distinction between chronic undernutrition (chronic insufficiency of calories and proteins) and acute undernutrition that may arise from wars, disasters, droughts and displacement of populations. When those acute episodes occur, there is not only massive suffering but also the risk of massive loss of life from starvation and disease. Violence and conflict often break out in hungry regions. Obesity marks the other end of the malnourishment spectrum and also causes a tremendous amount of disease and premature mortality. The United States, Mexico, Venezuela, Libya, Egypt, Saudi Arabia, South Africa and a few others have obesity rates above 30 percent. Europe and Russia have an obesity rate between 20 and 30 percent. The obesity epidemic most likely results from a combination of too many calories, the wrong kinds of calories and the extreme physical inactivity of urban life.

## **§2 US Agriculture**

A. Combined, the food and agriculture sector accounts for roughly one-fifth of the nation's economic activity, \$3.2 trillion of the United States' \$15.6 trillion Gross Domestic Product (GDP) 2012. There

are an estimated 2.2 million farms, 900,000 restaurants, and more than 400,000 registered food manufacturing, processing, and storage facilities in the US. The 1.9 percent of the US population who work full or part-time as farmers receive 0.7 percent of the GDP - \$109 billion – significantly less than half of the \$275 billion administered as payroll, grants, loans and food stamps by the United States Department of Agriculture (USDA) at a cost of \$150 billion. Off-farm work has played a key role in increased farm household income; and while farm household income was once deemed below the national average, in 2002 it exceeded the national average by nearly \$8,000. USDA’s National Agricultural Statistics Service, the agency which conducts the Census, highlighted in their release that 2012 set records for both the value of farm sales and the costs of production, with farmers and ranchers selling \$395 billion worth of products at a cost of \$329 billion, such that an average less than 17 percent of sales became actual income. Producers sold \$212 billion of crops and \$182 billion in livestock and animal products in 2012. NASS also noted that in 2012 for the first time ever, corn and soybeans topped 50 percent of all harvested acres. The average market value per farm was \$1.1 million in 2012, up from \$800,000 in 2007 and \$600,000 in 2002. Farm production expenses are estimated to have expanded dramatically. In 2012 farmers spent \$42 billion purchasing livestock and poultry, \$77 billion purchasing feed, \$30 billion on fertilizers, \$17 billion on petroleum products, \$30 billion on hired farm labor, \$14 billion on interest, and \$18 billion on chemicals. 88% of farms are owned families or individuals, 6% are partnerships, 4% are corporations and 1% are other cooperative, estate or trust, institutional etc. Only 50% of farmers farm as the primary occupation.

1. U.S. agricultural exports have been larger than U.S. agricultural imports since 1960, generating a surplus in U.S. agricultural trade. International trade has a major impact on U.S. agriculture. Exports are crucial, providing a market for a major share of crop production and a growing share of meat output. In 1996, 28 percent of U.S. farm cash receipts were generated by exports, while only 7 percent of U.S. gross domestic product (GDP) was attributable to exports. U.S. agricultural exports have varied widely rapid growth in the 1970s, the slump of the early 1980s, and the subsequent export recovery. Over this period, the value of agricultural exports has exceeded the cost of agricultural imports, generating a trade surplus each year. This surplus has contributed positively to the overall U.S. trade balance, allowing the importation of foreign-made cars, petroleum, electronics and wearing apparel. In 1996, more than one-half of all U.S. wheat production and 48 percent of rice production was exported. Cotton, soybeans and corn producers also depend on exports for large shares of their market. Although beef and pork export shares are lower, poultry exports account for 17 percent of production.

2. American agriculture and rural life underwent a tremendous transformation in the 20th century. Early 20th century agriculture was labor intensive, and it took place on a large number of small, diversified farms in rural areas where more than half of the U.S. population lived. In 1900 these farms employed close to half of the U.S. workforce, along with 22 million work animals, and produced an average of five different commodities. Global markets were increasingly important to U.S. farmers as the first wave of globalization—propelled by steam and the telegraph—was at its peak, and exports helped to fuel rising prices that helped to make 1910-14 the “golden age” of American agriculture. The next major change in the fortunes of agriculture came with the end of the First World War. Between the late 1920s and early 1930s agricultural import tariffs increased greatly. Even those countries dedicated to free trade were forced to intervene to try to save their agricultures from irrational cut-throat competition. However, as world market prices began to drop in the 1920s, US farmers joined manufacturing interests to push for the passage of the Smoot-Hawley tariffs in 1930 and world trade plunged. In the 1930s, the volume of U.S. agricultural exports fell by more than 20 percent from the

previous decade.

### U.S. Workforce Employed in Agriculture and Share of GDP 1900-2000

1900	1930	1945	1970	2000
40 percent of workforce employed in agriculture	21.5 percent of workforce employed in agriculture Agricultural GDP as a share of total GDP, 7.7 percent	16 percent of the total labor force employed in agriculture Agricultural GDP as a share of total GDP, 6.8 percent	4 percent of employed labor force worked in agriculture Agricultural GDP as a share of total GDP, 2.3 percent	1.9 percent of employed labor force worked in agriculture (2000) Agricultural GDP as a share of total GDP (2002), 0.7 percent

Source: Dmitri, Carolyn; Effland, Anne; Conklin, Neilson. The 20<sup>th</sup> Century Transformation of U.S. Agriculture and Farm Policy. United States Department of Agriculture. Economic Information Bulletin No. 3 June 2005

3. The final farm report set the farm population at 4.6 million, down from 23 million in 1950, when farm residents constituted 15 percent of the population, and 6 million in 1980, when farm residents made up 2.8 percent of the population. From 1970 to 1980 the total number of farmers in the United States declined by nearly half. The new agricultural export economy to pay for was actively arresting nonviolent marijuana growers and dealers who currently comprise around 40% of the federal prison population, 100,000, who must be released and compensated for the unjustified institutionalization. . Farm operations have become increasingly specialized, from an average of about five commodities per farm in 1900 to about one per farm in 2000. Commodity prices have also gone down. In 1974, farmers took home 32 cents of every dollar spent on food in the United States. Today, they only get 16 cents. Growth in agricultural productivity averaged 1.9 percent annually between 1948 and 1999. Productivity growth in manufacturing over the same period averaged 1.3 percent annually, although it ranged from 0 to 2.3 percent, depending on the industry. These highly productive and mechanized farms employ 1.9 percent of U.S. workers, use 5 million tractors and earn only 0.7 percent of the gross domestic product, today. Seventy-three cents of every farm program dollar ends up in the pockets of 15 percent of the nation's megafarms. Today almost a third of farm managers and 86 percent of farm workers live away from the farm and commute to the fields. While farms grew, the number of farmers plummeted. The number of farms in America has dwindled to 2 million, down from a 1935 peak of 6.8 million. Furthermore, the number of people employed in farm occupations has dropped to 1.9 million from a peak of 11.6 million farm workers in 1910. Not only has the number of farms and farmers declined precipitously, but the average farm size has increased from 160 acres to 473 acres per farm. Today over a third of farm produce comes from only 1.4 percent of our nation's largest farms. Farm residents now constitute only 1.9 percent of the national population, compared with 40 percent at the turn of the century. The final farm report set the farm population at 4.6 million, down from 23 million in 1950, when farm residents constituted 15 percent of the population, and 6 million in 1980, when farm residents made up 2.8 percent of the population. From 1970 to 1980 the total number of farmers in the United States declined by nearly half. The new agricultural export economy to pay for oil sabotaged the rural domestic economy arresting nonviolent marijuana growers and dealers who currently comprise around 40% of the federal prison population, around 100,000 innocent people who must be released from prison and compensated for the unjustified institutionalization. Marijuana is simply a

healthier high than Roundup.

4. During the Great Depression the vast majority blacks were forced to sell their family farms and move to the city in ‘the Great Migration’. In 1982 a bipartisan U.S. Commission on Civil Rights issued a report called “The Decline of Black Farming in America” that attempted to understand why black farmers were leaving the profession at two and a half times greater than that of whites. The committee found that one important reason was that black farmers were small farmers. The average commercial farm owned by a black man in the South was 128 acres. The average farm of a white landowner was 428 acres. Almost all the technological innovations that the United States government had subsidized over the previous decades, were geared toward increasing the productivity of large farms, and not to making small farms sustainable. The cost of basic equipment minimally necessary to run a commercial farm is much greater in proportion to the number of acres of land held by the average black farmer than it is for white farmers. The government’s income-support programs also had the indirect effect of pushing small farmers off their land. From the 1960s to 1990s about 115,000 black farmers left the profession. By the last decade of the twentieth century, the typical African American farmer who remained on the land was sixty years old. By the end of the 1980s there were fewer than two thousand African American farmers under the age of twenty-five in the entire United States. In 1999, the USDA settled a class action lawsuit, the Pigford Case, alleging discrimination against African-American farmers in the late twentieth century. The government's settlement of nearly \$1 billion with more than 13,300 farmers was reportedly the largest civil rights claim to date. The 2008 Farm Bill provided for additional farmers to have their claims heard, as 70,000 had filed late in the original program. In 2010 the federal government made another \$1.2 billion settlement in what is called *Pigford II* for outstanding claims.

5. SNAP cuts constitute deprivation of relief benefits under 18USC§246. The Farm Bill of 2008 changed the name of the Food Stamp Program to Supplemental Nutrition Assistance Program (SNAP). Promising not to cut benefits the average benefit amount increased rapidly from \$96.18 in 2007 to \$102.19 in 2008, to \$125.31 in 2009 to \$133.79 in 2010. Participation increased 53% from 26.3 million in 2007 to 40.3 million in 2010 reaching a high of 47.6 million in 2013. SNAP promised not to cut benefits and between 2008 and 2013 had the longest uninterrupted spurt of food stamp benefit growth the nation has ever enjoyed. The USDA then intentionally, abruptly, and with significant terrorism, cut aggregate SNAP benefits on Halloween 2013 and Thanksgiving 2016, but couldn't do the math right, although they tried twice on October 7 and November 10, 2016, this constitutes two counts of aggregate deprivation of relief benefits under 18USC§246. Average benefits payments went down from \$133.07 in 2013, to \$125.01 in 2014, up to \$126.83 in 2015 and down again to \$125.52 in 2016 this counts as two counts of intentional deprivation of relief benefits under 18USC§246. A strange section pertaining to publicly operated community health centers (from 1985?) needs to be repealed under 7USC§212a.

### **§3 United States Department of Agriculture**

A. The U.S. Department of Agriculture (USDA) provides leadership on issues related to food, agriculture, food safety, rural development, and natural resources. After the 2017 fire season it is held that all +/- 33,000 Forest Service (FS) employees and noxious contractors must be completely fired for poison hemlock, leaches, fleas, tics, Lyme, rabies and arson within the special maritime and territorial jurisdiction under 18USC§81, with disability retirement under 5USC§8337. The remainder of the \$5.3 billion FY 18 FS budget must be distributed under saw moratorium so that all National Forest and

urban forest interface slash piles are chucked and thickets chipped by National, State, County and City Park supervision under 54USC§100101 *et seq* to improve quality of life and reduce risk of catastrophic forest fire under 36CFR§261.5 and Agriculture Secretary under 16USC§551. The USDA was founded by President Abraham Lincoln signature of the Act to Establish a Department of Agriculture on May 15, 1962. FY 17 USDA employs 97,804 workers down from 103,000 with total program level of \$225 billion FY 2017 down - 2.6% from \$231 billion FY 16, provides 3.2 million farmers with crop insurance and 44 million people Supplemental Nutrition Assistance Program (SNAP) benefits. The FY 18 budget makes changes to FY 16 and FY 17 spending to explain much lower outlay totals, \$138 billion FY 16, \$133 billion FY 17 and \$140 billion FY 18, than previously given \$153 billion FY 16 to \$152 billion FY 17. Rural Business Cooperative and Commodity Credit Corporation are financed by off-budget electricity revenues and interest, respectively and should not be accounted for in the outlay table, although their budget contributes to the congressional budget authority. The USDA budget office must learn to express, in the USDA congressional budget request, USDA profits as undistributed offsetting receipts. The public is highly dissatisfied with SNAP welfare benefit growth that should be 3% annually = % increase in benefit amount + % increase in beneficiaries. Because everyone is very disappointed with the SNAP cuts of Halloween 2013 and Thanksgiving 2016, the USDA couldn't even calculate, the downward revision FY 16-18 should be adopted and growth estimates based on \$139 billion outlays FY 15 and \$140 billion FY 18 with \$12.4 billion in undistributed offsetting receipts. However the plan for further SNAP cuts FY 18 constitutes deprivation of relief benefits under 18USC§246. The public must be informed that SNAP benefits grow 3% FY 18 = % benefit amount + % new beneficiaries.

### Agriculture Budget Correction FY 15 - FY 18

USDA Outlays	FY 15	FY 16	FY 17	FY 18	FY 18 2.75%
Total Outlays	132,381	124,125	126,000	124,031	127,682
Estimated Outlays	139,115	138,248	133,062	140,035	140,035
Undistributed Offsetting Receipts	6,699	14,123	7,062	16,004	12,353
OMB	139,115	153,773	151,485	153,011	153,011
Staffing		94,893	95,890	90,627	96,753, 64,804

Source: USDA FY 18

1. It is serious crime that the USDA cut SNAP benefits and cannot now multiply after 2013 and 2016 deprivation of relief benefits under 18USC§246. The finding is that before cutting real agency outlays to achieve accounting goals the Commodity Credit Corporation and Rural Business Cooperative Service need to be deleted whereas funding for these programs is provided from loan repayments and earnings from electric cooperative investments and fees, respectively. The U.S. Forest Service (FS), established in 1905, is now a powerful, complex, far-flung super-agency of 33,000 employees that controls hundreds of billions of dollars-worth of timber, land, and other resources. Firing all 33,000 FS employees will reduce USDA employment from 97,840 FY 18 to 64,804, but only reduce federal outlays and/or congressional budget authority by \$5.3 billion from \$140 billion leaving the USDA \$7

billion in undistributed offsetting receipts at year end FY 18.

2. USDA outlay growth requires further re-estimation beyond 2.5% average agency spending growth because SNAP is an in-kind welfare program due 3% annual growth because SNAP is the liberal, free-market way for consumers to subsidize agriculture. The FY 18 USDA budget section on the Food and Nutrition Service (FNS) regarding \$78.5 billion SNAP outlays are higher regarding SNAP estimates of \$70.5 billion FY17. The FNS failed to do the SNAP math right twice in fall of 2016 and the FY 18 USDA budget must redo the SNAP estimates to explain the \$8 billion difference in FNS spending totals actually claimed by the FY 18 budget total. FY 17 \$70.5 billion SNAP spending is 53% of the \$133 USDA budget, wherefore USDA outlay growth should be  $2.75\% = 3\% \text{ SNAP growth} + 2.5\% \text{ administrative spending growth}$ . As a rule of thumb SNAP outlays are 50% of USDA outlays. To actually calculate Food and Nutrition Service (FNS) outlays of \$101.9 billion FY 17 - \$70.5 billion SNAP = \$31.4 billion administration. To make FY 18 estimates 3% growth in SNAP benefits is 72.6 billion + 2.5% growth in other FNS programs to \$32.2 billion = \$104.8 billion FY 18. As a rule of law the public must be informed that the administration is re-committed to 3% SNAP outlay growth = % increase in benefit + % new beneficiaries FY 18.

3. The details pertaining to the Commodity Credit Corporation Programs used in the balance sheet are not supported by an individualized explanation like other agencies, although their growth is distorting the budget alarmingly. CCC was incorporated October 17, 1933, under a Delaware charter with a capitalization of \$3 million. It was initially managed and operated in close affiliation with the Reconstruction Finance Corporation, which funded its operations. On July 1, 1939, CCC was transferred to the United States Department of Agriculture (USDA). It was reincorporated on July 1, 1948, as a Federal corporation within USDA by the Commodity Credit Corporation Charter Act (62 Stat.1070; 15 U.S.C. 714). As amended through the Presidential Appointment Efficiency and Streamlining Act of 2011, P.L. 112-166, Enacted August 10, 2012. The CCC Charter Act, as amended, aids producers through loans, purchases, payments, and other operations, and makes available materials and facilities required in the production and marketing of agricultural commodities. The CCC Charter Act also authorizes the sale of agricultural commodities to other government agencies and to foreign governments and the donation of food to domestic, foreign, or international relief agencies. CCC also assists in the development of new domestic and foreign markets and marketing facilities for agricultural commodities. CCC has no operating personnel. Its price support, storage, and reserve programs, and its domestic acquisition and disposal activities are carried out primarily through the personnel and facilities of the Farm Service Agency (FSA). FSA provides administrative support for the Commodity Credit Corporation (CCC), which funds most of the commodity and export programs, and some of the USDA conservation programs. The finding is that before cutting real agencies to achieve accounting goals the Commodity Credit Corporation needs to be deleted from the Outlays Table(s). Furthermore, the Rural Business Cooperative Service needs to be deleted whereas funding for these programs is provided from earnings from electric cooperative investments and fees and the different USDA budgets FY 17 – FY 18 threatens hyperinflation from \$255 million FY 16 to \$4.6 billion FY 16 for nothing.

**USDA Outlays by Agency FY 15 - FY 18**  
(millions)

	FY 15	FY 16	FY 17	FY 18	FY 18 2.75%
Farm and					

Foreign Agricultural Services					
Farm Service Agency	1,950	2,102	2,090	1,690	2,142
Risk Management Agency	7,350	4,239	4,793	8,711	4,913
Foreign Agricultural Service	252	231	458	337	277
P.L. 480	1,121	1,426	1,121	575	1,149
Rural Development					
Salaries and Expenses	227	83	104	62	107
Rural Utilities Service	1,602	249	261	205	268
Rural Housing Service	2,489	256	1,354	309	309
Food Nutrition and Consumer Services					
Food and Nutrition Services	103,958	101,442	101,918	96,925	104,800
Food Safety					
Food Safety and Inspection Service	991	1,046	1,024	1,047	1,050
Natural Resources and Environment					
Natural Resources Conservation Service	3,498	3,671	3,893	4,306	3,990
Forest Service	5,924	6,364	5,690	5,327	5,327
Marketing and					

Regulatory Programs					
Animal and Plant Health Inspection Service	1,712	1,461	1,442	1,153	1,478
Agricultural Marketing Service	323	373	347	350	356
Grain Inspection, Packers and Stockyards Administration	31	35	43	43	44
Section 32 Funds	740	801	764	727	783
Research, Education and Economics					
Agricultural Research Service	1,115	1,149	1,187	1,272	1,217
Economic Research Service	75	94	100	84	84
National Agricultural Statistics Service	173	155	193	185	198
National Institute of Food and Agriculture	1,323	1,323	1,377	1,566	1,411
Departmental Activities					
Office of the Secretary	42	58	89	64	64
Office of the Chief Economist	16	18	31	18	18
National	13	13	15	15	15

Appeals Division					
Office of Budget and Program Analysis	7	8	9	9	9
Office of Chief Information Officer	52	52	61	58	58
Office of Chief Financial Officer	6	5	6	6	6
Agriculture Buildings and Facilities	83	54	87	63	63
Hazardous Materials Management	6	1	11	6	6
Office of the General Counsel	46	48	53	48	48
Office of the Inspector General	89	94	100	93	93
Office of Civil Rights	23	21	24	23	23
Working Capital Fund	-22	-21	58	76	76
USDA Subtotal	135,215	126,851	128,703	125,353	130,382
Offsetting receipts, rescission, net interest, & other adjustments	-2,834	-2,726	-2,708	-1,322	-2,700
Total Outlays	132,381	124,125	126,000	124,031	127,682
Estimated Outlays	139,115	138,248	133,062	140,035	140,035
Undistributed Offsetting	6,699	14,1234	7,062	16,004	12,353

Receipts					
OMB	139,115	153,773	151,485	153,011	153,011
Staffing		94,893	95,890	90,627	96,753

Source: USDA FY 2017 Budget Summary

B. The U.S. Department of Agriculture (USDA) is made up of 29 agencies and offices with nearly 100,000 employees who serve the American people at more than 4,500 locations across the country and abroad. The U.S. Department of Commerce, Bureau of the Census conducted the census of agriculture for 156 years (1840-1996). The 1997 Appropriations Act contained a provision that transferred the responsibility for the census of agriculture to National Agricultural Statistics Service (NASS). The Secretary is assisted by a Deputy Secretary, 10 Offices, a Chief Information Officer, and 7 Undersecretaries that provide from two to four services. The 7 Undersecretaries are – (1) Natural Resources and Environment, (a) Forest Service, (b) Natural Resources Conservation Service, (2) Farm and Foreign Agricultural Services, (a) Farm Services Agency, (b) Foreign Agricultural Service, (c) Risk Management Agency (3) Rural Development, (a) Rural Utilities Service, (b) Rural Housing Service, (c) Rural Business Cooperative Service, (4) Food Nutrition and Consumer Services, (a) Food and Nutrition Service, (b) Center for Nutrition Policy and Promotion (5) Food Safety, (a) Food Safety and Inspection Service (6) Research, Education and Economics, (a) Agricultural Research Service, (b) National Institute of Food and Agriculture, (c) Economic Research Service, and (d) National Agricultural Statistics Service and (7) Marketing and Regulatory Programs, (a) Agricultural Marketing Service, (b) Animal and Plant Inspection Service, and (c) Grain Inspection, Packers and Stockyards Administration. The 10 Offices – (1) Chief Economist, (2) National Appeals Division Director, (3) Director of Communications, (4) Inspector General, (5) General Counsel, (6) Office of the Chief Financial Officer, (7) Office of Budget and Program Analysis, (8) Assistant Secretary for Congressional Relations, (9) Assistant Secretary for Administration, and (10) Assistant Secretary for Civil Rights.

#### **§4 Soil Conservation Service**

A. On April 27, 1935 Congress passed Public Law 74-46, in which it recognized that "the wastage of soil and moisture resources on farm, grazing, and forest lands, is a menace to the national welfare" and established the Soil Conservation Service (SCS) as a permanent agency in the USDA. In 1994, SCS's name was changed to the Natural Resources Conservation Service to better reflect the broadened scope of the agency's concerns to include forestry. The Soil Conservation Service (SCS) helps to determine what land is feasible to irrigate (soil type and slope) and when and how much water will be needed (specific crops and soil conditions), they will also suggest the most economical and efficient ways to deliver the water to the fields. All on farm irrigation begins with the supply canal or ditch. Water levels should be a minimum of one foot above the highest point of the field, and the canal or ditch should have the necessary headgate division boxes, turnouts and siphons to divert the water to the appropriate field from whence it is diverted again, into furrows. Slope should not exceed 0.25 percent for row crops or 5 to 6 percent for cover crops. Length and depth of furrow are determined by the potential rate of water flow and the absorptive rate of the soil. A free, individualized "Soil and Water Conservation Plan" complete with aerial photographs, soils maps, and soil survey interpretations, crop seed selections, contouring and irrigation problems, are available from the US Soil and Conservation Service (SCS).

1. Without the forest or windbreak cover, the soils have eroded at an accelerated rate. 24 billion tons of topsoil are lost worldwide each year to deforestation and a sixth of that, 4 billion, is lost in the United States. Soil is washed to sea, or lodged as dam-filling siltation in reservoirs (that cost taxpayers over 50 million dollars a year)). During the Ice Age, glaciers deposited an average of about 10 billion tons of till in moraines and outwash fans every year. The total movement of earth by humans now is estimated to be around 40-45 billion tons per year. Nearly 40 percent of the soils of the world are now seriously degraded. Globally, nearly one-third of the land devoted to farming has been lost to erosion in the last forty years and continues to be lost at a rate of some 25 million acres per year. The cultivation of maize has probably sent more soil down the Mississippi River in the last century than natural erosion did in the preceding twenty. Clever compilers of statistics say that for every bushel of corn produced, five bushels of soil wash into lowlands, ditches and streams or blow into the next county.

## **§5 Crop Insurance and Commodity Premiums**

A. Crop insurance policies are available for more than 100 crops, but four crops-corn, cotton, soybeans, and wheat-account for more than two-thirds of all the acres enrolled in crop insurance programs. There were \$11 billion payouts in 2012. The Federal crop insurance program continues to be highly subsidized and costs the Government on average about \$9 billion a year. This includes \$3 billion for the private insurance companies to administer and underwrite the program and \$6 billion in premium subsidies to farmers and other expenses. Crop insurance premiums need to be modified so that premiums for certified organic farms are 10% cheaper because organic crops are known to be 10% more flood and drought resistant under 7CFR§400.711. To treat the large, and often uninsurable GM corporations, who receive commodity program funds that drive the inexorable increase in farm size, fairly; it seems wise for the USDA to charge farmers a premium to be eligible for commodity program payments that have evolved income protection plans indistinguishable from crop insurance. The basic structure of crop insurance is the same, whether a producer chooses a yield-based or revenue-based policy. The producer chooses a certain level of insurance covering different levels of yield or revenue loss. The amount a producer pays in premiums increases with the level of coverage. The cost to taxpayers in premium subsidies and administrative and operation reimbursement also increases with the level of coverage chosen by a producer.

1. In 2016, the total cost for the Federal crop insurance programs was about \$5 billion. Of this amount, about \$1.5 billion was for net indemnities to producers (gross indemnities minus producer paid premiums/fees). Another \$1.5 billion was paid to the private insurance companies for delivery expenses and \$1.8 billion for underwriting gains, and \$47 million was used for other initiatives, including Federal Crop Insurance Act initiatives, programs related IT, and Agricultural Management Assistance. The budget proposes no funding for the Agricultural Management Assistance Program. The Budget proposes legislative changes to the Federal crop insurance program. These proposals include targeting crop insurance subsidies to producers that have an Adjusted Gross Income of \$500,000 or less; establishing a limit of \$40,000 for premium subsidies an individual may receive; and eliminating subsidized harvest price revenue coverage.

B. When electing to participate in a yield based crop insurance program, the producer selects both the percentage of yield loss of the crop covered by the crop insurance policy and the percentage of the market price of the covered crop based on estimated market conditions. The most basic level of

coverage is so-called catastrophic coverage. Under this policy the producer receives a payment for losses greater than 50 percent of "normal" yield and 55 percent of the estimated market price of the crop. Taxpayers pick the total cost of the premium for catastrophic coverage. Producers can select or "buy-up" higher levels of insurance coverage. Producers can buy-up policies that cover 50 percent of yield losses and 100 percent of estimated market price of the covered crop or up to 75 percent of yield losses and 100 percent of estimated market price for that crop. Taxpayers subsidize a lower percentage of the premium as the level of coverage goes up, but the costs to taxpayers go up as the coverage level increases but the premium costs also go up. So-called "Actual Production History" (APH) crop insurance policies account for over 90 percent of the yield-based policies sold.

1. Revenue-based insurance policies operate in much the same way as yield-based policies except that producers insure a target level of revenue based on the market prices of the covered crop and the producer's yield history. As with yield-based policies, the producer can select higher levels of revenue insurance. The percentage of the total premium paid by a producer increases as the amount of revenue covered by insurance increases. The cost total cost of premiums goes up as coverage goes up, which means the cost to taxpayers also goes up with higher levels of production even as the share of the premium covered by taxpayers goes down. The producer receives a payment when his or her actual revenue falls below the insured target level of revenue if the producers experience a loss of yield, a decline in prices, or some combination of both. Revenue-based insurance policies were first introduced as a pilot program in 1997. By 2003, revenue-based policies covered more acres than those covered by APH policies.

2. Farm subsidies were first established by President Franklin D. Roosevelt during the Great Depression to help farmers who were suffering. Prices for things like wheat, corn, tobacco, rice and milk had declined sharply in the 1930s. Roosevelt's New Deal program encouraged farmers to allow some fields to lie fallow or to kill excess livestock, the decreased supply increased prices for these commodities. From 1929 to 1932 the worst years of the Depression, before the election of Franklin D. Roosevelt, the cash income of South Carolina farmers dropped by two-thirds. Cotton farms in South Carolina were also being ruined by the boll weevil, a quarter -inch long beetle that punctured the round boll (or outer shell) of the cotton plant with its long snout, laid its eggs inside, and decimated the fluffy contents before harvest. The first farm bill was passed in 1933 to provide price stability for American farmers suffering through the Great Depression. At that time deflation caused prices for farm raised products to fall more than 50 percent, while farmers costs decreased by only 32 percent (a profit reducing cycle that occurred again in the recession of 2008 and 2009). During the (American) Depression, people were hungry because they couldn't afford to buy food, though farmers were producing plenty of it, they just weren't able to sell it. The solution: pay farmers not to grow so much with the goal of balancing supply and demand and helping them earn a better price. In 1933 alone, 6 million piglets were slaughtered. The U.S Supreme Court invalidated the act in 1936 because the money paid out in subsidies was not being distributed for the "general good". But with the addition of a few rules for soil conservation, which Congress believed would ensure an adequate food and fiber supply in the future, the farm bill began its long and convoluted journey. In 1936, President Franklin Roosevelt also launched a program to reward farmers for shifting from soil-depleting crops (corn, tobacco, wheat and cotton) to soil-conserving crops (legumes, vegetables and grasses).

C. Modern famines in the United States have occurred in the midst of plenty, with grain and meat to be had while people are unable to buy because they did not have the price of the opportunity. This discrepancy was called "surplus" and various methods were employed to dispose of that which farmers

produced but could not sell. Crops were plowed up after they had been planted; little pigs were killed because there seemed to be too many; cattle were slaughtered or their hides to reduce feed costs. Farms were told to plant fewer acres and paid for it, while being encouraged to adopt farming methods that would produce more per acre; prices were reduced to foreign customers but held up for American consumers; commodities were bought up by the government to be stored or given away. Loans were made on other farm produce to be stored and held off the market by farmers; and minimum prices were guaranteed by the government on one hand while ceilings were placed on commodities on the other. The acreage planted to corn, wheat, cotton, and tobacco was reduced 21% under the Agricultural Adjustment Agency. The average combined acreage planted to these four crops during the period 1931-33 was 218.5 million acres. The average acreage planted to these same crops during the period 1940-42 was 173 million acres. Comparisons for the same period show the a 5 percent increase in corn production, 21 percent increase in wheat, 17 percent decrease in cotton, and 5 percent increase in tobacco. Acreage of cotton was reduced 61 percent under the AAA but yield went up to 335 pounds per acre and production of cotton went up to 1.4 million bales, an increase of 100,000 bales. The AAA was ruled unconstitutional by the Supreme Court but the practice of subsidizing commodities continues. Practically all of the research carried on by the USDA is aimed toward more efficient production processing and marketing of farm commodities. This means greater yields per acre, less work per unit produced, and lower cost per unit. The idea is to give farmers a chance to adjust their production to peacetime levels and to avoid price collapses, such as followed World War I when wholesale milk prices dropped 32 percent, beef cattle skidded downward 57 percent, wheat went down 65 percent, cotton 76 percent, corn 78 percent, and other commodities dropped in like fashion. The term “parity” has been used to denote a fair price for farm products. To the farmer, the ideal year is the one in which he harvests a big crop at good prices – but that has happened only a few times to most farmers and never to some farmers.

1. Throughout the 1980s federal farm subsidies averaged nearly \$15 billion annually and between 1995 and 2010, American farmers received about \$262 billion in federal subsidies, during that time the wealthiest 10 percent of farmers received 74 percent of those subsidies. Almost two-thirds of American farmers didn't receive any subsidies at all. By 2010, nearly three-quarters of government commodity payments were given to the same top 10 percent of recipients. In agriculture, superimposed upon the ups and downs of the business cycle are violent price fluctuations due to the influence of the weather, pests and diseases. These unpredictable factors cause output to vary substantially from season to season, but consumers always want to eat the same quantity of food. So gluts cause dramatic price collapses and minor shortages persuade prices to soar. This inherent instability of agricultural prices is confusing to farmers who are unable to discern consumer requirements amid such chaotic price changes and are therefore unable to plan and invest sensibly. Hence, government intervention to stabilize agricultural prices has become accepted as a standard requirement of agricultural policy. The number of farmers who work somewhere outside of their farms has tripled since 1959. In 2008, 90 percent of total income for all farm households in the United States came from work outside of the farm. For farmers whose annual sales \$100,000 or less, and who often operate at a loss, off-farm income often accounts for 100 percent of their yearly income. At larger farms, with \$250,000 or more in annual sales, off-farm income is less than a quarter of annual pay.

2. The average size of a single farm grew, however to nearly 430 acres. In 2000 nearly half of the income for corn farmers in the United States was paid for by subsidies. In 1972, by contrast, the average annual federal subsidy to a corn producer was less than \$100. While the income of some farmers has increased by these supports, these gains have not transferred to those who are unable or

unwilling to “get big”. By the late 1970s payments for participating small farmers were as low as \$365. Farms with more than 2,500 acres, on the other hand, received as much as \$36,000 a year. These policies allowed larger farms to borrow and invest capital in more land and improved technology, resulting in increased production on their part and providing for an “increasing disadvantage for small farmers”. The USDA has acknowledged that these income-support programs could be contributing to the loss of small farms. As the agricultural economy became more concentrated in the hands of fewer and fewer companies in the twentieth century, most of these local stores were absorbed by national chains reluctant to extend loans. Supply controls ended with the 1996 Federal Agriculture Improvement and Reform Act, and new forms of income support payments not tied directly to farmers’ current production decisions— “decoupled” payments—replaced the older income support programs. The evolution of farm policy from one based on supply controls and high price supports to one based primarily on direct Government payments has undoubtedly reduced the economic inefficiencies of resource misallocation and price distortions associated with farm programs.

3. For the 2014 through 2018 crop years, all of the producers on a farm had to make a 1-time, irrevocable election to obtain either (1) price loss coverage under section 7USC§9016 on a covered commodity-by-covered-commodity basis; or (2) agriculture risk coverage under §9017. Not later than September 1, 2014, the Secretary shall establish and administer a margin protection program for dairy producers when actual dairy production margins are less than the threshold levels for a margin protection payment under §9053. The Secretary has been paying fair market value for livestock that the USDA disposes of to prevent outbreaks of disease under §8306. Since fiscal year 2012 such sums as are necessary of the funds of the Commodity Credit Corporation to make livestock indemnity payments to eligible producers on farms that have incurred livestock death losses in excess of the normal mortality have been made. Indemnity payments to an eligible producer on a farm shall be made at a rate of 75 percent of the market value of the applicable livestock on the day before the date of death of the livestock under §9081. This program relieves the USDA of needing to quarantine and destroy diseased animals as a matter of eminent domain for farms to be eligible. Large farms really need to be charged premiums.

**Commodity Credit Corporation Fund**  
**Commodity Payments Net Outlays**  
(Dollars in Millions)

Program	2014 Enacted	2015 Estimate	2016 Budget
<b>Commodity:</b>			
Feed Grains .....	\$2,352	\$282	\$5,594
Wheat .....	1,089	140	67
Rice .....	350	81	260
Upland and Extra Long Staple Cotton .....	607	1,138	408
Tobacco .....	-199	0	0
Dairy .....	6	-50	62
Soybeans and Products .....	625	36	217
Peanuts .....	46	59	379
Minor Oilseeds .....	18	7	68
Sugar .....	1	0	0
Honey .....	-3	0	0
Vegetable Oil Products .....	28	-7	13
Other Commodities .....	-2	-14	11
<b>Total, Commodity Payments .....</b>	<b>4,918</b>	<b>1,672</b>	<b>7,079</b>

Note: Negative amounts reflect excess of receipts versus outlays.

4. The commodity programs are critical components of the farm safety net, serving to expand domestic market opportunities and provide risk management and financial tools to farmers and ranchers. Net CCC expenditures in 2015 are significantly below the 2014 level primarily as a result of timing differences associated with the 2014 Farm Bill commodity programs. Prior to enactment of the 2014

Farm Bill, the 2015 commodity program payments would have been primarily composed of 2014-crop direct payments and 2013-crop counter-cyclical and average crop revenue election (ACRE) payments. However, the 2014 Farm Bill terminated the direct, counter-cyclical, and ACRE program for the 2014 crop and authorized in their place the Agricultural Risk Coverage (ARC) and Price Loss Coverage (PLC) programs. Under the terms of the 2014 Farm Bill, the 2014 crop ARC/PLC payments cannot be made before October 1, 2015 (i.e. fiscal year 2016). As a result, the 2015 commodity program payments reflect a reduction of about \$4.7 billion for the termination of the direct payment program. The final counter-cyclical and ACRE payments available under the 2008 Farm Bill are reflected in the 2015 commodity program payments and disappear in 2016. In addition, 2015 commodity program payments for Upland Cotton reflected about \$500 million in payments for the 2014 crop year under the Cotton Transition Assistance Payment (CTAP) program for upland cotton. CTAP was authorized in the 2014 Farm Bill to provide payments to growers of upland cotton as they transition from direct payments to the new Stacked Income Protection Plan (STAX) for producers of upland cotton. STAX will be effective for the 2015 and subsequent crop years and will be administered by the Risk Management Agency.

5. Modern commodity prices have largely stabilized and commodity subsidies have been reconfigured to be farm income insurance, synonymous with crop insurance. Commodity insurance premiums should be levied against factory farms. Commodity insurance and crop insurance should be combined. Commodity insurance requires downsizing, organic certification and permaculture reforestation to be socially and environmentally responsible federal beneficiaries. The transition from chemical agriculture to safer and healthier farming and agricultural commodity production practices cannot be dictated nationally because the transition from GM chemical agriculture is estimated to reduce yields for three years. County ballot initiatives have prohibited GM crops and heard the claims of uninsured farmers bereaved of their GM seeds that contaminated export crops. Although state and federal governments require extensive study and a long term transition plan so as to sustain commodity production levels while banning GM crops and/or pesticides, local governments are free to beautify the rural economy provided they pay commodity, crop insurance style, farm income support as a matter of eminent domain for the three year transition to an organic permaculture future, with tractor rollover protection (ROPs) sturdy enough to trust the seatbelt, small grain silos, and a respirator when working in the dirt and dust.

## **§6 Export Import**

A. Agriculture exports have had the strongest five-year period of growth in US history and reached an all-time high of \$152.5 billion in 2014. Agricultural exports remained flat until the 1960s but began to rise dramatically by the 1970s, propelled by adjustments in exchange rates as the dollar was freed from the gold standard and by the Soviet Union's growing appetite for imported grains and oilseeds. The agricultural sector of the 21st century, on the other hand, is concentrated on a small number of large, specialized farms in rural areas where less than a fourth of the U.S. population lives. Agricultural products, sometimes referred to as food and fiber products, cover a broad range of goods from unprocessed bulk commodities like soybeans, feed corn and wheat to highly-processed, high-value foods and beverages like sausages, bakery goods, ice cream, or beer sold in retail stores and restaurants. All of the products found in Chapters 1-24 (except for fishery products in Chapter 3) of the U.S. Harmonized Tariff Schedule are considered agricultural products. These products generally fall into the following categories: grains, animal feeds, and grain products (like bread and pasta); oilseeds and

oilseed products (like canola oil); livestock, poultry and dairy products including live animals, meats, eggs, and feathers; horticultural products including all fresh and processed fruits, vegetables, tree nuts, as well as nursery products and beer and wine; unmanufactured tobacco; and tropical products like sugar, cocoa, and coffee. Certain other products are considered “agricultural,” the most significant of which are essential oils (Chapter 33), protein isolates and modified starches (Chapter 35), raw rubber (Chapter 40), raw animal hides and skins (Chapter 41), and wool and cotton (Chapters 51-52). Manufactured products derived from plants or animals, but which are not considered “agricultural” by USDA’s definition are cotton yarn, textiles and clothing; leather and leather articles of apparel; and cigarettes and spirits. The World Trade Organization’s definition of agricultural products varies in that it includes some products like spirits and tobacco products.

### Total agricultural exports and imports, United States, FY 2004–2013

Fiscal year ending Sep. 30 <sup>1</sup>	U.S. total domestic exports			U.S. total imports for consumption, customs value			Surplus agricultural exports over agricultural imports
	Total merchandise exports	Agricultural exports <sup>2</sup>	Agricultural exports share of total exports	Total merchandise imports	Agricultural imports	Agricultural imports share of total imports	
	Million dollars	Million dollars	Percent	Million dollars	Million dollars	Percent	
2004 .....	795,303	62,401	8	1,406,032	52,668	4	9,733
2005 .....	877,710	62,517	7	1,618,937	57,711	4	4,806
2006 .....	993,203	68,593	7	1,834,339	64,026	3	4,567
2007 .....	1,110,805	82,220	7	1,906,928	70,063	4	12,157
2008 .....	1,297,574	114,911	9	2,152,782	79,320	4	35,591
2009 <sup>1</sup> .....	1,058,869	96,296	9	1,594,328	73,404	5	22,892
2010 .....	1,224,652	108,529	9	1,844,486	78,963	4	29,566
2011 .....	1,446,591	137,465	10	2,147,138	94,511	4	42,955
2012 .....	1,534,887	135,906	9	2,272,484	103,370	5	32,536
2013 .....	1,562,962	140,999	9	2,262,446	103,879	5	37,120

<sup>1</sup> Fiscal years Oct. 1–Sept. 30 revised. <sup>2</sup> Includes food exported for relief or charity by individuals and private agencies. ERS, Market and Trade Economics Division, (202) 694–5211.

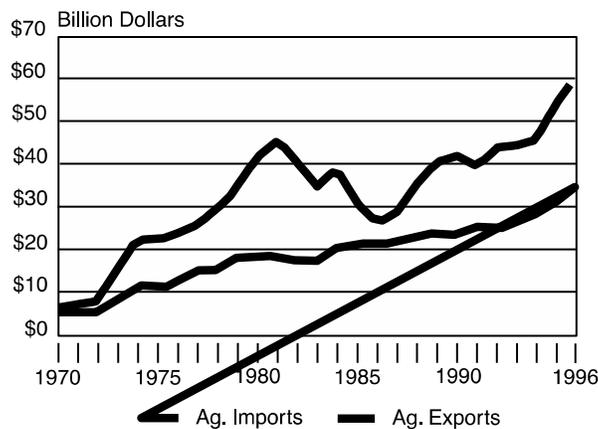
Credit: National Agricultural Statistics Service Agricultural Statistics 2014

1. U.S. agricultural exports have been larger than U.S. agricultural imports since 1960, generating a surplus in U.S. agricultural trade. International trade has a major impact on U.S. agriculture. Exports are crucial, providing a market for a major share of crop production and a growing share of meat output. In 1996, 28 percent of U.S. farm cash receipts were generated by exports, while only 7 percent of U.S. gross domestic product (GDP) was attributable to exports. U.S. agricultural exports have varied widely rapid growth in the 1970s, the slump of the early 1980s, and the subsequent export recovery. Over this period, the value of agricultural exports has exceeded the cost of agricultural imports, generating a trade surplus each year. This surplus has contributed positively to the overall U.S. trade balance, allowing the importation of foreign-made cars, petroleum, electronics and wearing apparel. In 1996, more than one-half of all U.S. wheat production and 48 percent of rice production was exported. Cotton, soybeans and corn producers also depend on exports for large shares of their market. Although beef and pork export shares are lower, poultry exports account for 17 percent of production.

2. The animal product share of total exports more than doubled during the 1973-94 period, but crop products still accounted for four out of five export dollars in 1994. Bulk commodities—food grains, feed grains, oilseeds and their products—dominated crop exports during this period, but this dominance has been eroding and the composition of crop exports changed. Exports of high value items, such as vegetables, fruits, and nuts more than tripled, increasing from 5.8 percent of total exports in 1973 to 18.1 percent in 1994. These changes occurred gradually and irrespective of the fluctuations in the value

of total exports. In 1996 US agricultural exports as a share of the production of certain products was: wheat 54%, soybeans 35%, rice 48%, cotton 42%, tobacco 14%, corn 24%, poultry 17%, beef 5% and pork 4%. Japan has been consistently ranked as the number one export market and its importance has been increasing. South Korea and Taiwan are also important Asian markets. China has been an erratic buyer of U.S. exports and many are optimistic it may become a major market. Canada has increased in importance as an export market and ranked second only to Japan in 1992. To the South, Latin America, particularly Mexico, also has increased in importance. The major decline occurred in trade with the countries of Western Europe, particularly the members of what is now the European Union, who have declared a policy of agricultural self-sufficiency, but these remain a significant market. African countries continue to be plagued by political and civil unrest and economic policies that hinder the performance of their economies. Until these problems are resolved there is little prospect for increased commercial trade in agricultural products.

**US Agricultural Trade Balance 1970-96**



Source: USDA, FATUS

3. U.S. consumers are more dependent on imports for certain commodities than others. Not surprisingly, these include tropical products not produced in the United States, such as coffee and bananas. Broccoli, fish, and grape imports account for relatively large shares of consumption. The percentage of certain commodities imported in 1996 was: coffee 100%, tea 100%, cocoa 100%, bananas 100%, spices and herbs 93%, broccoli for processing 69%, fish and shellfish 55%, grapes, frozen orange juice 24%, beef 10%, pork 4%. The share of agricultural imports classified as competitive with domestically produced items has increased from 66 percent in 1973 to 75 to 77 percent in the 1990s. These products represent a growing source of import competition for many U.S. producers.

**§7 National Organic Program**

A. Since the Organic Food Production Act of 1990 7USC(94)§6501-6523 was implemented, organic foods saw annual growth rates of 15 to 20 percent. By the turn of the millennium, more than 17 million acres worldwide were planted with organic foods. Though this was less than a fifth of the area planted with transgenics, the number of acres dedicated to organic farming was 10 times what it had been only 10 years previously. And the market for organic food had swelled to \$22 billion annually. Leading the global organic explosion was the European Union, where a phenomenal 35-fold expansion in organic acreage took place in the last 15 years of the twentieth century. In 1999, 3 percent of the EU total agricultural acreage, amounting to 10 million acre, was organic. In some countries, notably, Sweden,

Finland, Switzerland, and Italy, the organic acreage was even higher, running between 5 and 10 percent of total agricultural land. In Austria, fully 13 percent of the farmland was organic, and in some Austrian provinces the share was as high as 50 percent. In only the last four years of the twentieth century, the United Kingdom's organic area surged tenfold. In 1999 Uganda produced 10 percent of the world's organic cotton. 1.3 percent of Canada's cropland was organic. In the United States organic acreage amounted to only 0.2 percent of the nation's overall cropland. Yet retail sales of organic produce and products in North America were growing steadily at an impressive 20 percent a year, and by 1999 total organic sales were estimated at \$10 billion. Worldwatch Institute predicted that by 2010, 30 percent of the total farmed area in the European Union would be organic, since 2000 there has been only a one percent increase in European agricultural land, 4 percent, that is certified organic. Today the amount of organic farmland in the United States is still less than 1 percent. As of 2010 organic farming practices are in use on approximately 4 million acres in the United States and 30.4 million acres globally and sales are estimated at \$22 billion annually. There are an estimated 13,000 certified organic farmers in America, and quite a few small farmers who are organic but uncertified and don't want the USDA intrusion. Worldwide the official figure on organic farmland is still less than 1 percent of agricultural land. The statistics are probably not accurate because they are asking farmers to pay to certify their land organic and sell them "organic" seeds, fertilizer and pesticides and ignoring gardeners and small farmers who fertilize with compost and don't contaminate their crops with any mistaken, non-organic, money input.

1. The federal government provides for two programs to help defray the cost of state organic certification costs. (a) The Agricultural Marketing Service Organic Certification Cost Share Programs Fiscal Year 2015 provides organic operations may receive up to 75 percent of their certification costs paid during October 1, 2014 through September 30, 2015; not to exceed \$750 per certification scope. (b) The National Organic Certification Cost Share Program (NOCCSP) is available to producers and handlers (e.g., all four scopes of certification) in all 50 States, the District of Columbia, the American Samoa, the Commonwealth of the Northern Mariana Islands, the Commonwealth of Puerto Rico, Guam, and the United States Virgin Islands. The program provides \$10.3 million dollars of assistance in fiscal year 2015. Unused funds may be used in the next fiscal year.

B. In the United States, farmers who want to label their products as "organic" must comply with regulations of the Organic Food Production Act, which was passed by Congress as part of the 1990 Farm Bill. In response to this legislation, the USDA created the National Organic Program (NOP), which established a certification program designed to assure consumers that foods labeled organic have been grown, processed, or handled in compliance with standards designed to keep the food, as well as agricultural workers and the environment, free of harmful contaminants. The law also covers organic livestock and its meat, eggs, or milk. To label their products organic, farmers cannot use toxic synthetic pesticides and fertilizers, genetically engineered seeds or other materials, sewage sludge, irradiation, antibiotics, growth hormones, and fresh manure (the manure must be composted or a waiting period must be observed between the application of manure to a field and harvest of any crop that is likely to be eaten raw. Small market gardens earning more than \$5,000 annually must comply with federal standards in order to sell their produce as organic. This entails keeping detailed records of practices and materials, plus on-farm inspections and periodic residue testing. And the USDA service call database is notoriously infectious to the soil for staging breakdowns to steal everything that isn't heavy enough to warrant a service call, eat the onions and urinate in the bed while the infringing drug enforcement mines the surrounding public byways with monoclonal antibodies. If there aren't any tractor rollover deaths it is probably best not to sue the USDA who never paid compensation for the

pesticide damages and often didn't stop spraying after animal, human and environmental damage had become evident in the 20<sup>th</sup> century. Acceptable practices and materials are set by the U.S. Secretary of Agriculture and the National Organic Standards Board, which consists of organic farmers, organic food handlers and retailers, environmentalists, and consumers. A number of private organizations and some state agriculture departments also operate and enforce their own standards, provided they are consistent with federal guidelines of the National Organic Program (NOP).

1. The USDA organic seal has become a symbol that people can trust to ensure that there are no toxic chemicals in their food. The certification process is not an easy one. There are papers to fill out, inspections to pass, and standards to uphold. It is unlikely that any organic farmers are growing vast acreages of commodity crops such as corn and soybeans, but there are many successful large organic farms. Like chemical farms, organic growers also start with seed, but organic seeds must be purchased from organic seed sources or carefully collected from the finest of the previous year's crops. The organic farmer chooses their crops based on what they know will grow well in their climate and region and what they and the customers want to grow. Organic farming is a decent living because you make enough money, and you feel pretty good about doing it. Weeds grow and people are hired to pull them. Organic farmers have to pay a 5 percent premium to get the same crop insurance coverage as chemical farmers, although studies show organic crops outperform chemical crops over time, especially in bad weather, drought or flood. Matsunobu Fukuoka's 'One Straw Revolution' published 1977 states, Intensively farmed organic crops are an estimated 5 percent more, rather than less, drought and flood resistant and have less of a problem with weeds and pests than chemical farms. There is however a three-year transition period from chemical dependency to organic certification. Experts on insect damage estimate that losses in the first year after giving up insecticides would be about five percent. Loss of another five percent in abandoning chemical fertilizer would probably not be far mistaken. That is, if chemical fertilizer and pesticide spraying were abandoned, the average losses in the first year would probably reach about ten percent. After this initial loss, harvests would increase and eventually surpass their original levels. Chemical fertilizer drains the earth of its vitality. If it is used even for one generation the soil suffers considerably Therefore chemical farmers should pay 10% higher crop insurance premiums - modifying crop insurance so that farms that have been certified organic pay 5 percent less and chemical farms pay 5 percent more in crop insurance premiums under 7CFR§400.711.

2. The Farming System Trial (FST) study at the Rodale Institute begun in 1981 found crop yields from organic and synthetic chemical farms are similar in years of average precipitation. Organic farm yields are higher than those of chemical farms in years of drought and flood. Maria Rodale's grandfather J.I. Rodale launched Organic Farming and Gardening magazine in 1942, when chemical farming was taking root, Sir Albert Howard was a contributing editor. J.I. Rodale was ahead of his time in many ways, but he was also a part of his time. His magazine served as voice for a growing chorus of concern and back then, if you wanted to eat food without chemicals, there was only one way to do it: Grow your own. On his little farm in Allentown, Pennsylvania, that J.I. bought in 1940 he continued his experiment. J.I. died at the age of 75 on prime time television after bragging that he would live to 100 by eating organic food. Some states, such as California in 1979, had passed their own organic certification laws, but not until 1990 the year Robert Rodale, Maria's father and J.I.'s son, suddenly passed away in a car accident, did Congress pass the Organic Foods Production Act, which directed the USDA to develop national standards for organic products. The result is the Organic label that we now see on many items in supermarkets and other stores. For 7 long, contentious years, industry leaders, farmers, consumer advocates, a few enlightened scientists and the government worked to come to agreement on those standards. When the first set of rules was issued, the public was offered the

opportunity to comment. The USDA received nearly 300,000 comments, most demanding that irradiated foods, sewage sludge and GMOs be prohibited for certified organic products. That's more letters (e-mail was not yet in widespread use) than USDA had received ever before or since.

C. The USDA and scientists everywhere have been measuring the nutritional value of different foods for more than 50 years have found significant nutrient declines in all crops in all regions over the past several decades. Scientists are unsure of the cause. The amount of protein, iron, calcium, phosphorus, iron and vitamin C have all declined noticeably in all harvested fruits and vegetables in the United States from 1950 to 1999. Riboflavin, a B vitamin that helps the body convert food into energy, that is necessary for healthy skin, eyes, hair and liver, declined overall in fresh foods during that time period by nearly 40 percent. Fresh green beans lose nearly 80 percent of their Vitamin C within a week of being picked. Of every 100 children child born today, one will be diagnosed with autism before the age of 8. About 4.4 million children between the ages of 4 and 17 have been diagnosed with ADHD. Rates of asthma, diabetes and childhood obesity are at all-time highs and child food allergies have increased 18 percent in the last decade. People who eat organic foods reduce their pesticide intake by as much as 90 percent.

1. According to the National Agriculture Statistics Service, there are only half as many honey-producing hives in the United States as there were in 1980. Scientists are concerned that the widespread use of certain pesticides throughout the U.S. and Europe is impacting the central nervous system of bees, impairing their ability to perform the waggle dance effectively or carry out the other delicate tasks that are necessary for their ability to survive as a colony. Bees are responsible for producing as much as one of every three bites of food that we eat. A honeybee may visit as many as five thousand apple flowers a day, and bits of the female pollen get stuck to its body as it flies from flower to flower, creating the conditions in which an apple flower can pollinate then fruit. Were bees to disappear, we would lose much of our ability to produce many of our healthiest foods. Honeybees do not exist for themselves but work together for a common good. The queen bee devotes her entire life to laying as many as two million eggs. Scout bees are the first that are sent out from the hive to search for food – nectar and pollen. If the bees find the food more than a hundred feet away, they will return to the hive and perform a “waggle dance” for the other forager bees. The dance is one of the wonders of the natural world: a complicated bit of vector calculus that communicates where food is located. The orientation of the waggle dance in relations to the top of the hive indicates the food's direction. The bee is somehow smart enough to adjust for the sun's constant movement in the sky, altering its dance direction one degree for every four minutes that have passed since it was at the source's location. The frequency with which the bee “waggles” gyrates its little body – indicates the distance of the food from the hive.

## **§8 Supplemental Nutrition Assistance Program**

A. The U.S. Department of Agriculture (USDA) Food and Nutrition Services (FNS) Supplemental Nutritional Assistance Program (SNAP) serves as the first line of defense against hunger. It enables low-income families to buy nutritious food with Electronic Benefits Transfer (EBT) cards. Food stamp recipients spend their benefits to buy eligible food in authorized retail food stores. The Program is the cornerstone of the Federal food assistance programs, and provides crucial support to needy households and to those making the transition from welfare to work. The Food Stamp Act of 1977 codified at 7USC§2011 set forth a program of food stamps to guarantee low income people and families an adequate nutritious diet to eliminate hunger and malnutrition. Participation in the food stamp program

is limited to those households whose incomes and other financial resources, held singly or in joint ownership, are determined to be a substantial limiting factor in permitting them to obtain a more nutritious diet, upper limit of household income is 130% of the poverty line. SSI beneficiaries are automatically eligible under 7USC§2014. Under SNAP rules, the maximum benefit levels for each fiscal year — which are the benefit amounts that go to households with no disposable income after deductions for certain necessities — are set at 100 percent of the cost of the Thrifty Food Plan, USDA’s estimate of the minimum amount that a family needs to afford a bare-bones, nutritionally adequate diet, for the preceding June.

### Supplemental Nutrition Assistance Program (SNAP) Statistics 2007-2018

<b>Fiscal Year</b>	<b>Average Participation</b>	<b>Average Benefit</b>	<b>Total Benefits</b>		<b>Total Costs</b>
	--Thousands--	--Dollars--	-----Millions of Dollars-----		
1969	2,878	6.63	228.80	21.70	250.50
1970	4,340	10.55	549.70	27.20	576.90
1971	9,368	13.55	1,522.70	53.20	1,575.90
1972	11,109	13.48	1,797.30	69.40	1,866.70
1973	12,166	14.60	2,131.40	76.00	2,207.40
1974	12,862	17.61	2,718.30	119.20	2,837.50
1975	17,064	21.40	4,385.50	233.20	4,618.70
1976	18,549	23.93	5,326.50	359.00	5,685.50
1977	17,077	24.71	5,067.00	394.00	5,461.00
1978	16,001	26.77	5,139.20	380.50	5,519.70
1979	17,653	30.59	6,480.20	459.60	6,939.80
1980	21,082	34.47	8,720.90	485.60	9,206.50
1981	22,430	39.49	10,629.90	595.40	11,225.20
1982	21,717	39.17	10,208.30	628.40	10,836.70
1983	21,625	42.98	11,152.30	694.80	11,847.10
1984	20,854	42.74	10,696.10	882.60	11,578.80
1985	19,899	44.99	10,743.60	959.60	11,703.20
1986	19,429	45.49	10,605.20	1,033.20	11,638.40
1987	19,113	45.78	10,500.30	1,103.90	11,604.20
1988	18,645	49.83	11,149.10	1,167.70	12,316.80
1989	18,806	51.71	11,669.78	1,231.81	12,901.59
1990	20,049	58.78	14,142.79	1,304.47	15,447.26
1991	22,625	63.78	17,315.77	1,431.50	18,747.27
1992	25,407	68.57	20,905.68	1,556.66	22,462.34
1993	26,987	67.95	22,006.03	1,646.94	23,652.97
1994	27,474	69.00	22,748.58	1,744.87	24,493.45
1995	26,619	71.27	22,764.07	1,856.30	24,620.37
1996	25,543	73.21	22,440.11	1,890.88	24,330.99
1997	22,858	71.27	19,548.86	1,958.68	21,507.55
1998	19,791	71.12	16,890.49	2,097.84	18,988.32

1999	18,183	72.27	15,769.40	2,051.52	17,820.92
2000	17,194	72.62	14,983.32	2,070.70	17,054.02
2001	17,318	74.81	15,547.39	2,242.00	17,789.39
2002	19,096	79.67	18,256.20	2,380.82	20,637.02
2003	21,250	83.94	21,404.28	2,412.01	23,816.28
2004	23,811	86.16	24,618.89	2,480.14	27,099.03
2005	25,628	92.89	28,567.88	2,504.24	31,072.11
2006	26,549	94.75	30,187.35	2,715.72	32,903.06
2007	26,316	96.18	30,373.27	2,800.25	33,173.52
2008	28,223	102.19	34,608.40	3,031.25	37,639.64
2009	33,490	125.31	50,359.92	3,260.09	53,620.01
2010	40,302	133.79	64,702.16	3,581.78	68,283.94
2011	44,709	133.85	71,810.92	3,875.62	75,686.54
2012	46,609	133.41	74,619.34	3,791.27	78,410.61
2013	47,636	133.07	76,066.32	3,866.98	79,933.30
2014	46,536	125.35	69,999.81	4,130.17	74,129.98
2015	45,800	126.83	69,705.77	4,233.42	73,939.19
2016	44,300	125.52	66,672.64	4,339.27	71,011.91
2017	43,857	125.52	66,059.17	4,447.75	70,506.92
2018	44,296	128.03	68,054.60	4,558.94	72,613.54

Source: USDA Food and Nutrition Service

1. The Farm Bill of 2008 changed the name of the Food Stamp Program to Supplemental Nutrition Assistance Program (SNAP). Promising not to cut benefits the average benefit amount increased rapidly from \$96.18 in 2007 to \$102.19 in 2008, to \$125.31 in 2009 to \$133.79 in 2010. Participation increased 53% from 26.3 million in 2007 to 40.3 million in 2010 reaching a high of 47.6 million in 2013. SNAP promised not to cut benefits and between 2008 and 2013 had the longest uninterrupted spurt of food stamp benefit growth the nation has ever enjoyed. The USDA then intentionally, abruptly, and with significant terrorism, cut aggregate SNAP benefits on Halloween 2013 and Thanksgiving 2016, but couldn't do the math right, although they tried twice on October 7 and November 10, 2016. Average benefits payments went down from \$133.07 in 2013, to \$125.01 in 2014, up to \$126.83 in 2015 and down again to \$125.52 in 2016 this counts as two counts of intentional deprivation of relief benefits under 18USC§246. A strange section pertaining to publicly operated community health centers (from 1985?) needs to be repealed under 7USC§212a.

2. Food stamp statistics date to 1969 when \$250.5 million fed 2.8 million people. The Food Stamp Act of 1977 wrongly reduced benefits from \$5.7 billion for 18.6 million beneficiaries in 1976 to \$5.5 billion for 17 million beneficiaries in 1977. Beneficiaries rose to 21 million in 1981 but fluctuated downward until Public Law 100-435, the Hunger Prevention Act of 1988 was signed into law September 19, 1988. Following this initiative, Public Law 101-624, the Mickey Leland Memorial Domestic Hunger Relief Act of November 28, 1990 established EBT as an issuance alternative and permitted the Department to continue to conduct EBT demonstration projects. Following the Personal Responsibility and Work Opportunities Reconciliation Act of 1996 (PRWORA) that removed the entitlement of recipients to AFDC and replaced that with a new block grant to states called Temporary Assistance to Needy Families (TANF) food stamp benefits languished.

3. Food Stamp had their best run with the renaming of the program to Supplemental Nutrition Assistance Program (SNAP) between 2009 to Halloween 2013 and Thanksgiving 2016. Since then benefits have gotten smaller and beneficiaries are poorer. A law is needed to ensure poor Americans receive a full ration of SNAP benefits and the in-kind benefit spending increases 3% annual SNAP growth = % growth in beneficiaries + % growth in benefits. Food stamp statistics date to 1969 when \$250.5 million fed 2.8 million people. The Food Stamp Act of 1977 wrongly reduced benefits from \$5.7 billion for 18.6 million beneficiaries in 1976 to \$5.5 billion for 17 million beneficiaries in 1977. Beneficiaries rose to 21 million in 1981 but fluctuated downward until Public Law 100-435, the Hunger Prevention Act of 1988 was signed into law September 19, 1988. Following this initiative, Public Law 101-624, the Mickey Leland Memorial Domestic Hunger Relief Act of November 28, 1990 established EBT as an issuance alternative and permitted the Department to continue to conduct EBT demonstration projects.

4. After the Farm Bill of 2002 food stamp participation increased from about 17.2 million in fiscal year 2000 to 26 million people in July 2006. The rate of payment accuracy in the FSP improved 34 percent between FY2000 and FY2004 and the 94.12 percent overall payment accuracy rate was the highest achieved since the inception of the program. USDA awarded \$48 million to 24 States for their exemplary administration of the program in fiscal year (FY) 2005. By August 2008, participation had reached an all-time (non-disaster) high of 29 million people per month. The participation increases occurred at a time when eligibility for food stamp benefits expanded as a result of the 2002 Farm Bill. Moreover, there was a consistent focus on outreach and improved access to FSP benefits. Some of the most recent increase in participation may be caused by the current economic slowdown and the recent rise in unemployment rates. During this time, payment accuracy continued to improve and the program set a new payment error rate record for fiscal year 2007 of 5.64.

5. The 2008 farm bill (H.R. 2419, the Food, Conservation, and Energy Act of 2008) was enacted May 22, 2008 through an override of the President's veto. The new law increased the commitment to Federal food assistance programs by more than \$10 billion over the next 10 years. In efforts to fight stigma, the law changed the name of the Federal program to the Supplemental Nutrition Assistance Program or SNAP as of Oct. 1, 2008, and changed the name of the Food Stamp Act of 1977 to the Food and Nutrition Act of 2008. Additional Recovery Act funds were terminated as of October 31, 2013 in accordance with an illegitimate Republican interpretation of section 442 of the Healthy, Hunger-Free Kids Act of 2010 (Public Law 111-296). The cuts were deep and totalitarian, as has happened so many times before under the Food Stamp Act of 1977. SNAP beneficiaries did not get the tenure promised by Food, Conservation and Energy Act of 2008 H.R. 2419 and the longest uninterrupted growth in food stamp from the Farm Bill of 2002 was brought to end.

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## **Art. 2 Federal Land and Water**

### **§9 Private and Public Acres**

A. The U.S. has 2.3 billion acres of land. However, 375 million acres are in Alaska and not suitable for agricultural production. The land area of the lower 48 states is approximately 1.9 billion acres. To put things in perspective, keep in mind that California is 103 million acres, Montana 94 million acres, Oregon 60 million acres and Maine 20 million acres. Only 66 million acres are considered developed lands. This amounts to 3 percent of the land area in the U.S., yet this small land base is home to 75 percent of the population. In general, urban lands are nearly useless for biodiversity preservation. Furthermore, urbanized lands, once converted, usually do not shift to another use. Rural Residential Land comprises nearly all sprawl and subdivisions along with farmhouses scattered across the country. The total acreage for rural residential is 73 million acres. Of this total, 44 million acres are lots of 10 or more acres. Developed and rural residential make up 139 million acres, or 6.1 percent of total land area in the U.S. This amount of land is not insignificant until you consider that we planted more than 80 million acres of feeder corn and another 75 million acres of soybeans (95 percent of which are consumed by livestock, not tofu eaters) last year alone. These two crops affect more of the land area of the U.S. than all the urbanization, rural residential, highways, railroads, commercial centers, malls, industrial parks and golf courses combined. About 349 million acres in the U.S. are planted for crops. This is the equivalent of about four states the size of Montana. Four crops -- feeder corn (80 million acres), soybeans (75 million acres), alfalfa hay (61 million acres) and wheat (62 million acres) -- make up 80 percent of total crop acreage. All but wheat are primarily used to feed livestock. The amount of land used to produce all vegetables in the U.S. is less than 3 million acres. Some 788 million acres, or 41.4 percent of the U. S. excluding Alaska, are grazed by livestock. This is an area the size of 8.3 states the size of Montana. Grazed lands include rangeland, pasture and cropland pasture. More than 309 million acres of federal, state and other public lands are grazed by domestic livestock. Another 140 million acres are forested lands that are grazed. Forest lands comprise 747 million acres. Of these lands, some 501 million acres are primarily forest (minus lands used for grazed forest and other special categories).

1. Natural Resources Council of Maine reports 2,263 million acres of land in the United States, 786 million acres of federal and state land combined (34.7 %), 588 million acres of federal land (26.0%) and 198 million acres of state land (8.7%). The NRCM table details state and federal government ownership of lands open to public access in the United States. This includes parks, forests and grasslands; it excludes land used for such purposes as office buildings, prisons, or B29 irrigation projects. Military bases and tribal lands are included because both can represent a significant percentage of "non-private" land ownership in a state even though public access may be restricted. Neither military nor tribal lands are included in the columns totaling state and federal land ownership by NRCM. Although 55 million acres of Indian Treaty Reservations are usually excluded, "Federal

land" totals usually also count 30 million acres of military land, 25.2 million with USACE okay, Tennessee Valley Authority (TVA) and Other. Where possible, with the exception of land owned by the Army Corps of Engineers, acreage figures refer, only to land area and do not include water areas, leases or easements. The total area covered by urban parkland in the United States exceeds one and a half million acres, with parks ranging in size from the jewel-like 1.7-acre Post Office Square in Boston to the gargantuan 490,125-acre Chugach State Park in Anchorage. And their usage dwarfs that of the national parks—the most popular major parks, such as Lincoln Park in Chicago receive upwards of 20 million users each year, and New York's Central Park gets about 35 million visits annually.

### Public Land in the United States, by Agency 2017

Agency	Acres
Interior Department	485.6 million
Bureau of Indian Affairs	55 million
Bureau of Land Management	245 million
Bureau of Reclamation	6.6 million (7.1 million inc. easements)
Fish and Wildlife Service (interior, non-add federal or public)	90 million (interior, withdrawn from public domain)
National Park Service	89 million (270 million with National Forests, and 467 million with related State, County and City Parks)
Forest Service	181 million (or zero)
Wilderness Preservation System (non-add)	109 million
Department of Defense	30 million
USACE	7.8 million
Total Federal Land (BIA non-add)	649.4 million
State Lands	197.5 million
City Park	>1.5 million
Total Public Land in United States	903.4 million

Source: Interior Department. Trust for Public Land City Parks Facts Report 2011, Natural Resources Council of Maine (NRCM), Military, USACE, State, Tribal Lands, County Parks unknown.

2. There is a margin of error of only 0.78% between the 649.4 million acre agency total estimate above, with NRCM estimates that the Federal Government owns a total of 654,885,389 acres of land in the United States. However, NRCM accounting of 605,232,690 acres is in error in regards to the distribution of land to four federal land agencies, BLM, NPS, FS and NWRS. BLM's declared 341 million acres of National Resource Land is underestimated at 247 million. The 89 million acres supervised by the National Park Service overestimated at 174 million acres. NRCM does not take note from the Fish and Wildlife Service (FWS) realty office that the National Wildlife Refuge System land is usually withdrawn from public domain because they are purchased by private land conservation corporations. Nor does the 44.5 million acre estimate respect that the Bureau of Indian Affairs has

come down from a 66 million to 55 million estimate of tribal land withdrawn from the public domain of all but the Interior Department land totals. At 192 million acres NRCM is only slightly higher than the 181 million acre official estimate of National Forests. NRCM agency estimates unlawfully distribute agencies from what is believed to be accurate total, federal and state land ownership data, agency columns are not copied. Federal lands, for which ownership is claimed by the U.S. federal government, pursuant to Art 4 Sec. 3 Clause 2 of the US Constitution. The National Resource Council of Maine, produces a state by state table that distinguishes federal, state and total acres in the United States. As of March 2012, out of the 2.27 billion acres (918.6 million hectares) in the country, about 28% of the total, 636 million acres (257.2 million hectares) was owned by the Federal government.

B. Only five laws in the century following the Revolution dealt specifically with forests. All five, the first of which passed in 1799, affirmed the government's right to reserve timber on the public domain for shipbuilding by prosecuting those caught taking wood for unauthorized use. The American attitude toward government reserves was about the same as it had been to colonial reserves established under King George III. There was even a "Pine Tree Riot" in 1772 during which more than twenty rebellious Down-Easters crossed out, with switches and clubs on the British sheriff's bare back, "the account against them of all logs, cut, drawn and forfeited, making the sheriff wish he had never heard of pine trees fit for masting the royal navy". Under the royal charter that the colonies went to war to revoke, Virginia, for example, had been granted ownership to all the territory west to the Mississippi River and north into the Upper Peninsula of what would become Michigan, and still claimed this territory after the war. Massachusetts claimed enormous sections that now run through Michigan and Wisconsin. Maryland, not as blessed as such other states, threatened that it would not sign the Articles of Confederation until the landed states surrendered their claims to the newly formed central government. All lands should be common owned.

1. On October 10, 1780, the Continental Congress agreed, and formally made the donation of these claims to the government a condition of equal membership in the federal union. In 1802 these transfers amounted to more than 233 million acres. The following year the nation doubled its size when President Thomas Jefferson agreed to pay France \$27 million for its Louisiana Territory, and over the next fifty-one years diplomacy, war, and purchase spread the sovereignty of the federal government to more than 1.4 billion acres. The Northwest Ordinance of 1785 spelled out the method by which lands were to be surveyed and prepared for sale by auction to citizens moving westward. They would be divided up into townships six miles to a side. These, in turn, would be subdivided into thirty-six numbered sections of one square mile each (640 acres). Whole townships would be offered for sale, at a minimum bid of one dollar an acre. Congress reserved to the federal government sections 8, 11, 26, and 29 in each township, and section 16 was to be set aside for the support of public schools. Later in 1812 the General Land Office was established in the Treasury Department to handle all land sales. As Jefferson predicted the landless poor would settle the land in spite of everybody. By 1828, two-thirds of the residents of Illinois lived on land that still belonged to the federal government. Land sales never accounted for more than 10 percent of the government's operating revenue. President Thomas Jefferson asserted that lands to which the government title would be protected from exploitation, however from the moment he left office, his dictate was ignored. Throughout most of the century following the Revolution a tradition of laissez-faire was fostered, not to defend against trespass or to prosecute those suspected of depredations. During the mid-1800s eastern forest in the United States were being exploited by an industry that cared little about conservation or the future. The only value of forests was in timber, and when that was gone it was time to move on to other tracts.

2. The Preemption act of 1841 allowed squatters to go out into the un-surveyed domain and stake a claim to a piece of it, at \$1.25 an acre. The government also started giving land away to promote settlement and progress through a succession of gifts to wagon-road companies (3 million acres), land grant colleges (77 million acres), swamp-reclamation projects (65 million acres), and railroads (94 million acres). In 1847, George Perkins Marsh a U.S. congressman from Vermont and well-known botanist, called upon Congress to address the “destructive impacts of human activities on forests”. At the time, forest industry had moved on to the vast pine forests of the Lake States. On March 3, 1849, Congress created the Home Department, and charged the Interior with managing a wide variety of programs. In less than thirty years, this entire resource had been expended, leaving an enormous volume of “slash” in tops and other waste wood that fueled some of the most severe fires every seen in North America, destroying top soil that had formed over the course of millennia. Today, the Secretary of the Interior, leads an agency with more than 70,000 employees. Interior serves as steward for approximately 20 percent of the nation’s lands, including national parks, national wildlife refuges, and other public lands; oversees the responsible development of conventional and renewable energy supplies on public lands and waters; is the largest supplier and manager of water in the 17 Western states; and upholds trust responsibilities to the 566 federally recognized American Indian tribes and Alaska Natives.

3. The Homestead act of 1862 granted any citizen twenty-one years old or the head of a household the right to lay claim to 160 acres of government land; he could live on it for six months, then buy it for \$1.25 an acre, or live on it for five continuous years and cultivate it, after which he would receive the title for nothing more than the small filing fee. Between 1862 and 1882, 552,112 homestead entries were filed. Only 35 percent of these claims proved up to full ownership. 80 million acres of public land had been privatized by 1900. Fraud, usually through the medium of dummy entries, enabled already outsized ranching and farming operations to grow even larger with the gift of government land. The Timber Culture Act of 1873, granted an additional 160 acres to homesteaders who promised to plant forty acres of the grant in trees, and the Desert Land Act of 1877, which made 640 acre tracts available at \$1.25 an acre, providing the claimant could prove that he had brought water to his claim in an effort to irrigate it. Millions of acres of public land were joined to private monopolies.

4. In 1880 the U.S. Geological Survey and a Public Lands Commission were created. The Public Lands Commission issued its report in 1880. It included the first codification of the nearly three thousand land laws and regulations that had been applied to the public domain since 1785. The Carey Act of 1879 authorized the transfer of as much as one million acres of the public land domain to individual states, providing these states then turned around and sold it cheaply to irrigation companies, who would sell it to individual farmers, with attached water rights, in order to finance irrigation works. The Reclamation (or Newlands) Act of 1902 create the Reclamation Service (later renamed the Bureau of Reclamation), whose function it would be to build federal dams and irrigation works in the West. Water derived from federal irrigation works would be made available only to farm units of 160 acres (or 320 acres, in the case of a man and wife) and only to those who would live on and work the land.

5. An Enlarged Homestead Act of 1909 increased the size of a homestead claim to 320 acres, but only on those lands not suitable for irrigation. The Pickett Act of 1910 authorized the President to make withdrawals for “any public purpose”, but lands so withdrawn were still open to mining for metalliferous minerals under the General Mining Law. The Stock-Raising Homestead Act of 1916 made 640 acres obtainable enabling huge ranch operations to get bigger in support of the war demand for beef. The Mineral Leasing Act of 1920 allowed oil companies access to petroleum reserves on the

public domain, national forests, and wildlife refuges by a leasing system. The leases were awarded through a competitive bidding process, and the government would receive a royalty on all oil extracted. Coal land were also folded into this law. Later, the states in which the extraction took place would get a cut of the royalties. Shortly before taking office in 1929, President Herbert Hoover announced no federal oil lands would be leased unless requested by Congress. The ban remained in force until 1932 by which time vast deposits of oil had been struck in east Texas and Oklahoma. The Taylor Grazing Act became law on June 28, 1934. More than 80 million acres, later increased to 142 million, were closed to entry under any of the land laws. The Taylor Act created grazing districts local ranchers would be issued grazing permits every year for an allotted number of animals. The Interior Secretary was authorized to set grazing fees, of which 25 percent was earmarked for range management and improvement. The act also established the Division of Grazing. The first grazing fee set in 1935 was five cents per cow per month, a fraction of what private grazing lands cost to lease.

C. The NRCM table is based on one produced in 1995 by National Wilderness Institute. All data was corroborated, expanded and, where necessary, corrected and updated, with the exception of that in column "Owned by State." Figures for total areas of states reflect land acreage only and are from the US Bureau of the Census, Statistical Abstract of the United States (1991). Federal land ownership is volatile; land is acquired and disposed of, transferred between agencies and reclassified frequently. The federal data in this table are changing continually and it should be assumed that the state data are as well. BLM data are from US Bureau of Land Management, Public Land Statistics: 1998 (vol. 183) US Dept. of Interior, Washington, DC, 1999. Forest Service data are from the US Forest Service, Lands and Realty Management, US Department of Agriculture. Land Areas Report, September 30, 1999. The gross acreages of many National Forests are larger due to other land owners (including private inholdings) within the Forests' boundaries. National Wildlife Refuge data are from the U. S. Fish and Wildlife Service, Division of Realty, 2000. The Army Corps of Engineers data includes only the 456 lakes on or around which there is some recreational activity. This data includes both the land and water area. The Corps owns other lands which do not have any designated recreational activity. Data from: US Army Corps of Engineers Water Resources Projects. Fee Ownership and Acres for Intensive Recreation Report. 1999. Tribal Lands are held in trust but not owned by nor administered by the federal government. These lands are not included in either the "Total Area Owned by State and Federal Gov'ts" or "Owned by Federal Gov't" columns. The Federal and State acreages for the State of Alaska are given as they will be when all lands due to the State and to the Native Corporations as per the terms of the Alaska Statehood, Alaska Native Claims Settlement and Alaska National Interest Lands Conservation Acts are conveyed. With the exception of one reservation on Metlakatla Island, there are no tribal lands per se in Alaska. Instead, Native villages and regions were incorporated and a total of 44 million acres of land is being conveyed to the Corporations from the Federal Government. This land is now privately owned by the Native Corporations.

**Public Land Ownership by State, 2017**  
(acres)

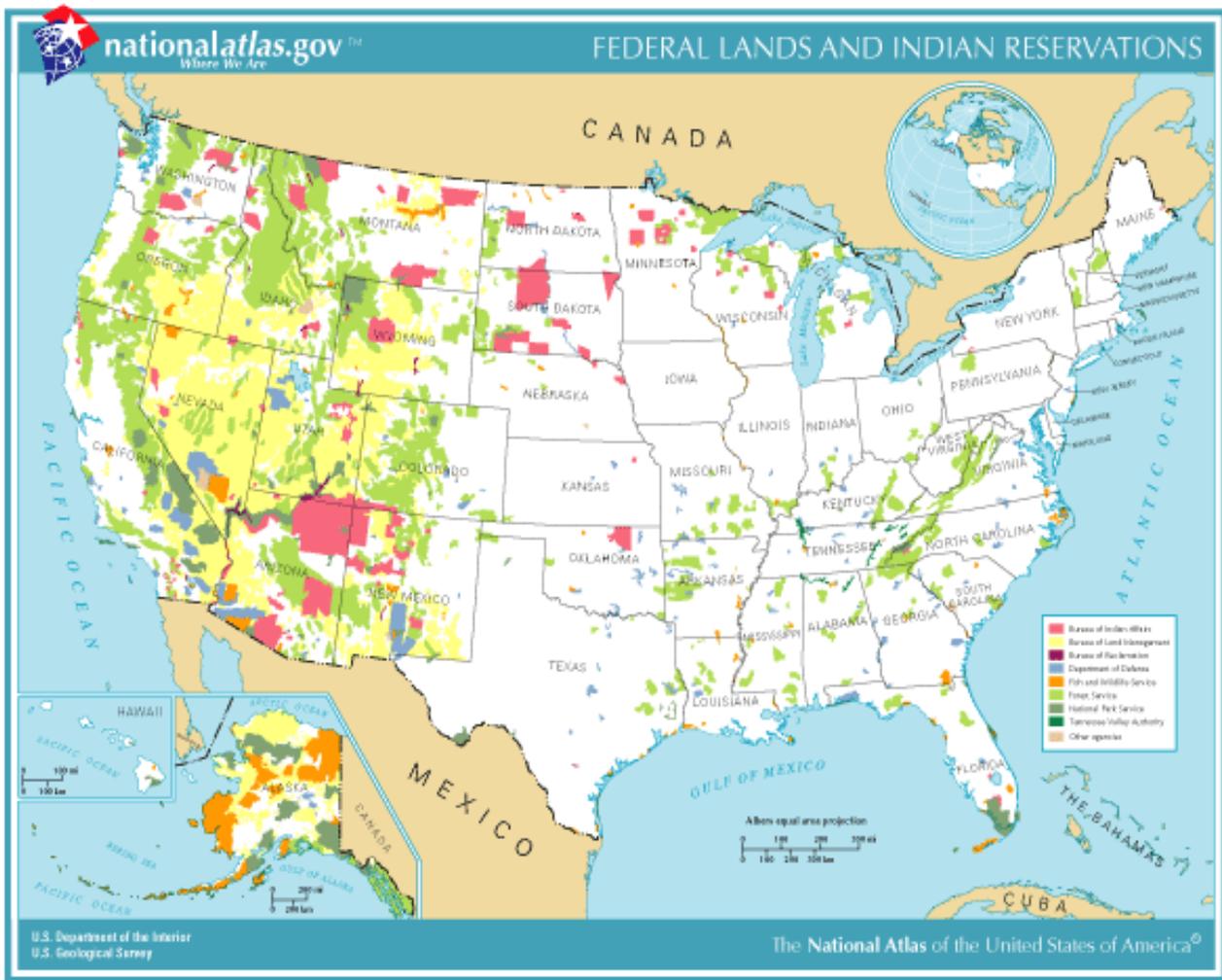
State	Total Area	Owned by State & Fed Gov't	% of Total Area	Owned by Fed Gov't	% of Total Area	Owned by State	% of Total Area
AK	365,039	325,700	89.22	219,900	60.24	105,800	28.98

AL	32,480	1,236	3.81	840	2.59	396	1.22
AR	33,328	3,949	11.85	3,287	9.89	653	1.96
AZ	72,730	38,979	53.59	28,895	41.10	9,084	12.49
CA	99,823	42,288	42.36	40,045	40.12	2,244	2.25
CO	66,387	28,459	39.86	23,541	35.46	2,917	4.39
CT	3,101	180	5.79	6.79	0.22	173	5.58
DE	1,251	88	7.05	27.28	2.18	60.90	4.87
FL	34,558	9,069	26.24	4,333	12.54	4,737	13.71
GA	37,068	1,735	4.68	1,385	3.74	349.7	0.94
HI	4,111	549	13.36	524.88	12.77	24.20	0.59
IA	35,760	370.74	1.04	104.34	0.29	266.40	0.74
ID	52,980	35,245	66.66	32,496	61.36	2,748	5.19
IL	35,580	836.78	2.35	430.88	1.21	405.90	1.14
IN	22,957	522.35	2.28	216.65	0.94	305,7	1.33
KS	52,367	479.5	0.92	167.20	0.32	312.30	0.60
KY	25,429	900	3.54	789.30	3.10	110.50	0.43
LA	27,882	2,132	7.65	1,387	4.97	744.6	2.67
MA	5,016	277.85	5.54	45.95	0.92	231.90	4.62
MD	6,256	429	6.86	84.58	1.35	344.40	5.51
ME	19,754	1,060	5.36	170	0.86	889.20	4.50
MI	36,358	8,169	22.47	3,680	10.12	4,489	12.35
MN	50,955	8,952	7.57	3,573	7.01	5,379	10.56
MO	44,095	2,655	6.02	1,625	3.69	1,030	2.33
MS	30,025	1,653	5.51	1,545	5.15	108.50	0.36
MT	93,156	32,473	34.86	27,277	29.28	5,196.4	5.58
NC	31,179.50	2,180.47	6.99	2,044.47	6.56	136	0.44
ND	44,156.2	2,187.41	4.95	1,375.31	3.11	812.10	1.84
NE	49,201.90	785.76	1.60	538.86	1.10	246.90	0.50
NH	5,740.20	908.41	15.83	744.21	12.96	164.20	2.86
NJ	4,748.20	840.98	17.71	101.08	2.13	739.90	15.58
NM	77,673.60	31,554.72	40.62	22,854.72	29.42	8,700	11.20
NV	70,275.80	56,972.28	81.07	58,846.08	80.99	126.20	0.18
NY	30,223.40	11,174.55	36.97	79.56	0.28	11,095	36.71

OH	28,209.90	678.96	2.59	256.98	0.98	421.70	1.81
OK	43,954.60	1,008.75	2.29	571.35	1.30	435.40	0.99
OR	61,441.90	19,403.60	31.58	16,407.70	26.70	2,995.90	4.88
PA	28,684.80	4,228.29	14.74	571.69	1.99	3,656.60	12.75
RI	668.80	61.16	9.14	1.66	0.25	59.50	8.90
SC	19,271	1,000.42	5.19	794.22	4.12	206.20	1.07
SD	48,574.70	3,659.78	7.53	3,569.88	7.35	89.90	0.19
TN	26,380.80	2,814.75	10.67	1,092.75	4.14	1,722	6.53
TX	167,625	3,216.40	1.92	2,391.40	1.43	825	0.49
UT	52,587.50	37,019.77	70.40	33,194.97	63.12	3,824.80	7.27
VA	25,342.70	2,449.87	9.67	2,102.97	8.30	346.90	1.37
VT	5,919.40	486.17	8.21	390.97	6.60	95.20	1.61
WA	42,612.50	15,513.50	36.41	11,648.40	27.34	3,865.10	9.07
WI	34,761.00	5,633.61	16.21	1,987.71	5.72	3,645.90	10.49
WV	15,415.70	1,530.00	9.92	1,080.80	7.01	449.20	2.91
WY	62,147.20	33,964.23	54.65	30,099.43	48.43	3,864.80	6.22
Total	2,263,222	785,659	34.71	588,135	25.99	197,524	8.73

Source: Natural Resource Council of Maine 2011, despite inconsistent rounding US totals (copied from NRCM above) are within a couple thousand acres, ten thousandths of a percent margin of error.

1. Alaska’s 35,000 miles of convoluted coastline is half that of the whole United States. In summer, temperatures can hit one hundred degrees. In winter, readings plunge to seventy-five below zero, with temperatures remaining at about forty below zero for weeks of darkness. North of the Arctic Circle, the Kobuk sand dunes shift in the wind; farther south, glaciers, one bigger than the state of Rhode Island, calve into deep bays and inlets. Alaska’s Mount McKinley is the highest mountain in North America. Thousands of miles of rivers course through Alaska, and its lakes number in the tens of thousands, though much of the state is arid, receiving less than twenty inches of precipitation a year, except in the southeast panhandle, where precipitation is heavy enough to produce rain forests of giant Sitka spruce and hemlock. The public lands of Alaska are managed: 31.8 million acres by the National Park System; 22.9 million acres by the National Forest System; 106.6 million acres by the BLM as National Resource Lands; 77 million acres in the Wildlife Refuge System; 56 million acres in the Wilderness Preservation System; 3,352 miles of Wild and Scenic Rivers; and 2,037 miles of National Trails. The Japanese invasion of the Aleutian Islands in 1942, was the only time in the war that American soil in the Western Hemisphere was invaded and occupied by enemy troops. During the spring of that year, 2,500 American soldiers died in combat on the islands of Attu and Kiska. The 300,000 American soldiers created the territory’s first airfields, radio stations, sewers, and schools. Alaska became a state in 1958 and in 1960 the 9 million acre Arctic Wildlife Refuge was established. Alaska was given 104.6 million acres of BLM land. Alaska could retain 90 percent of the royalties generated from oil and mineral leases on the remaining public domain. In all other states, income from subsurface federal leases could not exceed 25 percent of the royalties earned.



D. Although federal land agencies make internal distinctions between different grades of land they supervise, undeveloped land from all agencies can be designated to the Wilderness Preservation System created by the Wilderness Act was signed into law by President Lyndon Johnson on September 3, 1964. At its signing, the Wilderness Act immediately designated as wilderness 9.1 million acres of national forest, national park, and wildlife refuge land. The NWPS includes wilderness on four types of lands managed by the U.S. Government: National forests, National parks, National wildlife refuges, Bureau of Land Management (BLM) lands. The wilderness system has grown from 9.1 million acres from its beginning to roughly 109 million acres today, totaling 762 Wilderness Areas. That equals less than two percent of the lower 48 states. In the lower forty-eight states, the great bulk of land might qualify for addition to the National Wilderness Preservation System. By agency standards, few places were pristine or “untrammelled” enough to be classified as wilderness. If the ground showed any evidence of any past alteration, such as an overgrown road or an abandoned mine shaft, chances were the entire tract would be eliminated for its lack of purity. Of 256 areas surveyed in the East, only three sites were identified as potential wilderness. To remedy this situation, Congress passed the Eastern Wilderness Act in 1973. The new law added sixteen parcels in thirteen states for a total of 207,000 acres, and made it clear that if an area had recovered significantly from prior abuse, as was often the case in the fast-growing forests of the humid East, it was on its way back to a pristine condition and

could be included in the National Wilderness Preservation System.

1. In 1972 the Forest Service Roadless Area Review and Evaluation (RARE) studied 56 million acres and recommended 12.3 million acres, or 19 percent of the roadless areas for wilderness protection. The second review in 1977, called RARE II identified almost three thousand potential wilderness areas in thirty-eight states, for a total of 62 million acres, but only 15 million acres of national forestlands were to be set aside as wilderness. The wilderness system preserves the wildest of our wild lands with the highest level of government protection. Today, the National Wilderness Preservation System includes more than 109 million acres of protected wilderness areas for all Americans to enjoy. The first states to gain Wilderness in the NWPS were Arizona, California, Colorado, Idaho, Minnesota, Montana, North Carolina, New Hampshire, New Mexico, Nevada, Oregon, Washington and Wyoming. There is plenty of exploited farmland, commercial timberland and mines to sustain developed lands, worldwide. Care must be taken to expand and protect wilderness lands against development. The human race must win our food forest home back in one hundred years, or so, from the concurrent inventions of agriculture, war and cities, that left the food forests burned, livestock eaten by pillaging soldiers and humans nearly a foot shorter due to malnutrition, in the beginning of the Holocene era circa 10,000 B.C. for thousands of years until large multi-city kingdoms and empires arose to secure regional trade routes and livestock. Upon signing the Wilderness Act, President Johnson said: "If future generations are to remember us with gratitude rather than contempt, we must leave them something more than the miracles of technology. We must leave them a glimpse of the world as it was in the beginning, not just after we got through with it."

2. National Wilderness Protection System under 16USC§1131 is the direction for non-park service land management to stay on the National Trail System Act. A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

## **§10 Interior Department**

A. On March 3, 1849, when the Congress created the Home Department, it charged Interior with managing a wide variety of programs. In the last half of the 19th century, these programs ran the gamut of overseeing Indian Affairs, exploring the western wilderness, directing the District of Columbia jail, constructing the National Capital's water system, managing hospitals and universities, improving historic western emigrant routes, marking boundaries, issuing patents, conducting the census, and conducting research on the geological resources of the land. Today, the Department is the steward of 20 percent of the Nation's lands including national parks, national wildlife refuges, and the public lands; manages the Nation's public lands and minerals including providing access to public lands and the Outer Continental Shelf for renewable and conventional energy; is the largest supplier and manager of water in the 17 western States and a supplier of hydropower energy; and upholds Federal trust

responsibilities to Indian Tribes and Alaska Natives. It is responsible for migratory wildlife conservation; historic preservation; endangered species conservation; surface-mined lands protection and mapping. Interior owns approximately 43,000 buildings, 100,000 miles of road, and 80,000 structures— including dams, border walls, laboratories, employee housing, irrigation and power infrastructure. During the peak summer seasons, the Department of the Interior has nearly 70,000 employees in 2,400 locations across the United States, Puerto Rico, U.S. Territories, and Freely Associated States.

1. The Secretary of the Interior or such officer as he may designate shall perform all executive duties appertaining to the surveying and sale of the public lands of the United States, or in anywise respecting such public lands, and, also, such as relate to private claims of land, and the issuing of patents for all grants of land under the authority of the Government under 43USC§2. The Interior Secretary is not able to add the total amount of acres held by the Departments, nor can the Secretary subtract revenues from total budget authority and then subtract total outlays of agency spending, to determine undistributed offsetting receipts in negative. The empirical inability of the Secretary to add and subtract compromises the 2.5%, 3-4% for Indian Affairs health, education and cash welfare programs, annual growth calculus of meticulously professional agencies commanding fair prices in competition with 2.7% annual consumer price index inflation. Undistributed offsetting receipts at year end reduce the deficit by being the first funds administered to pay for the following year's budget.

**Interior Department, Subtraction Simplification FY 16 - FY18**  
(millions)

	FY 16	FY 17	FY 18 error	FY 18 2.5%
Total Budget Authority	18,959	19,193	17,988	19,812
Revenues	-8,800	-10,700	-11,200	-11,200
Total Outlays	10,159	8,493	6,788	8,612
Federal Outlays	-13,400	-13,300	-11,700	-11,700
Undistributed Offsetting Receipts	-3,241	-4,807	-4,912	-3,088

Source: Interior Department Congressional Budget Justification FY 18

2. Federal lands, are those for which ownership is claimed by the U.S. federal government, pursuant to Art 4 Sec. 3 Clause 2 of the US Constitution. The sneak enactment, was the not the only error in the publication of Title 54, National Park Service and Related Programs by Pub. L. 113–287, §6(e), Dec. 19, 2014, 128 Stat. 3272. Title 16 Conservation Chapter 1 National Parks was gutted and now obstructs conservation with the Presidential second amendment propaganda dispute regarding lawful hunts in National Wildlife Refuges under 16USC§1a-7b that should be repealed by Trump so as to cease to obstruct lawful hunts or be construed to incite violence, promote second rate law or impair a right guaranteed to a person under the first article of amendment to the Constitution or limit any legal remedy for forceful interference with a person’s lawful participation in speech or peaceful assembly under 16USC§5206. In response to violent Presidential tampering of conservation statute Presidential proclamations are no longer prescribed to patent land by the United States Code and National Forest rules and regulations are directed to the Agriculture Secretary under 16USC§551 *et seq.* Trump is exaggerating the size of the mining to swimming hole parcels and is absolutely not welcome to kill

loggers with his “moral turpitude” regarding slash piles and arson within the special maritime and territorial jurisdiction under 18USC§81 by the Forest Service and to a lesser extent BLM logging operations “left in piles” federally. There were years of peacetime during the Obama administration when not a single person employed by the 2.8 million strong US military died, but like territorial aggression, dying is back in fashion. The Trump administration is in no state of park legislation to militarily aggress the logging industry, the most dangerous career in the nation. The reason why the Presidential proclamation of National Monuments has been repealed is that, in the United States one does not beg for a proclamation, one impeaches the president and his three marine corp general coup under Arts. 2 Sec. 4 and Art. 3 Sec. 3 of the U.S. Constitution. The unprofessional Secretary's military-industrial land grab must limited to the occupationally and recreationally safe national interest of mining to swimming hole contracts in Utah under 43USC§1701(12) and impeached from the fo-rest for Conspiracy Art. 81 Uniform Code of Military Justice (UCMJ) 10USC§881, Art. 104 UCMJ Aiding the Enemy 10USC§904 and Obstruction of Justice Rule 96 (Art. 134) of the Manual for Courts-Martial.

3. Public lands are to be retained in Federal ownership, unless as a result of the land use planning procedure, it is determined that disposal of a particular' parcel will serve the national interest under 43USC§1701(1)(2) and (12) to promote the Mining and Minerals Policy Act of 1970 under 30USC§21a. Freehold or leasehold interests in national parks and monuments of scientific significance is prohibited under 54USC§102901(a). Other than a few environmentally and socially responsible mining to swimming hole parcels in Utah, when a mining contractor actually manifests, Trump and Zinke's treason against the national monuments may be impeached as moral turpitude. Swimming holes in Utah are okay with the United States Code and Occupational Safety and Health Administration (OSHA). Interior department logging however needs to be limited to salvage logging, roads and trails, in burned and responsibly silvicultured national forests, national resource lands and private lands. Logging sites must not be left in slash piles and slashing and piling with intent to burn is trespassed by the ton for unlawful intrusions and violations of the rules and regulations under 24USC§154. The Mediterranean climate shrubbery must cease and slashed thickets must be professionally chipped or burned by winter campfires that are slept by, or more cities may be burned and people will die in forest fires. All slash and burn fuel reduction strategies are foolish, but those involving coniferous forests, that are not unnaturally thickly planted, can usually be swiftly and cheaply chucked, with a standard of care to prevent trail obstruction and death by falling overhead object, to prevent any piling of firewood and restore the forest floor to a swiftly decomposing state of natural appearing litter that pleases refugee mama bear and cubs as specially requested of the resident litter remover by papa bear. Ask not what your country can do for you, ask how much wood, could a wood chuck, chuck and chip, if a wood chuck, could chuck and chip wood under 24USC§422, 24USC§423(b) and 54USC§302904?

4. Trump traveled west to announce his intention to shrink the Bears Ears and the Grand-Staircase Escalante national monuments in Utah, without announcing any specific mineral extraction land purchases or arrived at any swimming hole agreements to ensure restrictions on public access are temporary and limited to protecting the populace from industrial accident. A group of 27 monuments were ordered by the President to be reviewed earlier in the year in response to what the Republican president has condemned as a "massive federal land grab" but is condemned as an military industrial land grab due to the Trump's failure to listen to either conservationists or industrial money. Bears Ears is going from 1.5 million acres to nearly 229,000 acres. The Grand-Staircase Escalante is going from around 2 million acres to 1 million acres. Trump says that local lands shouldn't be controlled by the whims of regulators thousands of miles away. Residents know how to protect it. In December, shortly before leaving office, Obama irritated Utah Republicans by creating the Bears Ears National

Monument on 1.35 million acres (2,100 square miles) of land sacred to Native Americans and home to tens of thousands of archaeological sites, including ancient cliff dwellings. Trump signed an executive order in April directing Zinke to review the protections. Zinke has also recommended that Nevada's Gold Butte and Oregon's Cascade-Siskiyou monuments be reduced in size, though details remain unclear, whereas commercial logging is the most dangerous career in the nation, doesn't leave swimming holes, or much biological diversity and the National Monuments are some of the most well cared for, fire resistant land in the West, other than the National Park, and there are millions of acres of arsoned Forest Service land to be salvage logged. Trump is able to upend the protections under the 1906 Antiquities Act, which gives the president broad authority to declare federal lands as monuments and restrict their use. Presidents have modified the boundaries to remove lands from monuments 18 times in the past. The most significant reduction occurred in 1915 when President Woodrow Wilson halved Mount Olympus National Monument, which is now a National Park. Trump is exaggerating the size of the mining to swimming hole parcels in Utah and logging is not only the most dangerous career in the nation, only 7 million of BLMs 247 million acres are devoted to logging and federal logging permit growth is not prudent. Any forestry industry growth must be limited to the professional salvage logging of arsoned National Forests, without leaving slash piles, or contracting with any federal government but the Interior Department whereas the Forest Service must be de-commissioned for slashing to burn a 60 times greater forest fire risk than national parks. No piles. Interior Department federal saw license.

5. National Park Service and Related Organization, end of the law, compels the Forest Service to surrender their claim to 181 million acres of National Forests and the \$5.3 billion FY 18 Forest Service budget to the interim professional supervision of state and county parks of competent jurisdiction, pursuant to park grants codified in 24USC§423(b) with reference to 54USC§302904. The sneak enactment, was the not the only error of 6th stage of Democratic-Republican (DR) two party system political science, in the publication of Title 54, National Park Service and Related Programs by Pub. L. 113–287, §6(e), Dec. 19, 2014, 128 Stat. 3272. Title 16 Conservation Chapter 1 National Parks was gutted and now obstructs conservation with the Presidential second amendment propaganda dispute regarding lawful hunts in National Wildlife Refuges under 16USC§1a-7b that should be repealed or transferred to the Chapter on Obstruction of Lawful Hunt in 16USC§5201 *et seq.* by Trump so as to cease to obstruct lawful hunts or otherwise be construed to incite violence against the conservation movement, promote second rate law or impair a right guaranteed to a person under the first article of amendment to the Constitution or limit any legal remedy for forceful interference with a person's lawful participation in speech or peaceful assembly under 16USC§5206. The once disturbing appendage, has become the end of the law, National Park Service and related organizations as codified Title 54 of the United States. Congress must suppress incitement to armed conflict with Title 16 Conservation. The Fish and Wildlife Service (FWS) is up in arms. Park supervision of public lands is necessary to protect the Western United States from damage by Republican sawyers intent on destroying the land value for the no good of reason of arson contracts encroaching ever closer to campgrounds, buildings, cities and human life. The National Wilderness Protection System is the one-way for non-park serviced forests to grow. City contractors must debar sawyers to prevent recidivism to the murder-suicide incidental to the concurrent invention of fast food agriculture, cities and war just after 10,000 B.C. when pillagers ate the livestock and left the food forests of their neighbors burned. Humans decreased in stature by nearly a foot, until kingdoms of several cities, and empires, arose to secure trade routes and rangeland, and any prospective corporate tax relief, from perpetuating unlawful occupations in violation of the Fourth Geneva Convention relating to the protection of the civilian population from pillaging and collective punishment under Art. 33. It is the right of parks of

competent jurisdiction, to trespass forestry arsons for treason - defined as the destructive and damaging "unlawful cutting" of trees, shrubs and budgets under Art. 2 Sec. 3 & 4, and Art. 3 Sec. 3 under the US Constitution. Piles must be chucked and thickets of slash chipped, or burned in the rainy season, under the supervision of a park district of competent jurisdiction. Peace. No fo"rest" labor. No unlawful cutting. No piles. One winter campfire. No territorial acquisition by the use of force, abuse of the forest or language. Fire arson sawyers today (FAST) Act orders the President to decommission the Forest Service under Art. 2 Sec. 3 of the US Constitution, and delegate to the National Park Service and related organizations the authority to chuck slash piles and chip thickets of these additional fire hazards under 54USC§100101 *et seq.*

**Interior Budget Authority by Bureau FY16 - FY18**  
(millions)

	FY 16	FY 17	FY 18	FY 18 2.5%
Bureau of Land Management	1,440	1,447	1,224	1,483
Bureau of Ocean Energy Management	101	79	114	114
Bureau of Safety and Environmental Enforcement	109	107	112	109
Office of Surface Mining Reclamation and Enforcement	887	633	633	633
US Geological Survey	1,063	1,061	923	1,088
Fish and Wildlife Service	2,860	2,905	2,766	2,978
National Park Service	3,429	3,444	3,261	3,501
Bureau of Indian Affairs and National Indian Gaming Commission	2,958	2,935	2,633	3,008
Departmental Offices	3,454	3,527	3,291	3,615
Department-wide Programs	1,301	1,670	1,818	1,863
Bureau of Reclamation	1,340	1,368	1,195	1,402
Central Utah Completion Act	17	17	18	18
<b>Total Budget Authority</b>	<b>18,959</b>	<b>19,193</b>	<b>17,988</b>	<b>19,812</b>
Revenues	8,800	10,700	11,200	11,200
Total Outlays	10,159	8,493	6,788	8,612
Federal Outlays	13,400	13,300	11,700	11,700

Undistributed Offsetting Receipts	3,241	4,807	4,912	3,088
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Source: Zinke, Ryan. The Interior Budget in Brief. May 2017

B. Interior Department is particularly challenged to learn to do the subtraction it takes to estimate in agency congressional budget requests, a healthy profit margin of undistributed offsetting receipts would be prudent, however they are calculated in secret by the Office of Management and Budget, and the Department of Defense has not declared their lion's share of difference between total war and peacetime spending. Interior Department funding for FY2014 was \$11.6 billion, \$275 million or 2.3 percent below the funding level requested and \$653 million or 5.9 percent over the 2013 enacted level. The estimate for revenue collections by the Department in 2011 is \$14.0 billion, this more than offsets the budget request for current appropriations of \$12.18 billion in 2011. Interior's FY 18 budget request is \$11.7 billion in current authority, \$1.6 billion or 12 percent below the 2017 CR baseline level, \$3.1 billion more than actual costs for normal 2.5% agency spending growth FY 17-FY18. The Administration also proposes to transfer \$123.9 million from the Department of Defense for commitments to the Republic of Palau, increasing Interior's total 2018 budget to \$11.9 billion in current authority. The 2018 budget called for \$1.6 billion below 2017 and supported 59,968 full time equivalents. This represents a reduction of roughly 4,000 full time equivalent start from 2017. To accomplish this the Secretary hopes to rely on a combination of attrition, but this is deprivation of relief benefits under 18USC§246 and separation incentives, but this is bribery of witnesses under §201. Elementary school mathematics reveals that the President's \$11.7 billion in outlays is enough to pay 2.5% growth in outlays from CR17 and produce \$3.1 billion undistributed offsetting receipts FY18.

1. Public lands are to be retained in Federal ownership, unless as a result of the land use planning procedure, it is determined that disposal of a particular' parcel will serve the national interest under 43USC§1701(1)(2) and (12) to promote the Mining and Minerals Policy Act of 1970 under 30USC§21a. Freehold or leasehold interests in national parks and monuments of scientific significance are prohibited under 54USC§102901(a). Swimming holes in Utah, pardon the fo-rest. Trump may repeal the Presidential dispute regarding the right to bear arms and lawfully hunt in National Wildlife Refuges under 16USC§1a-7b or suppress terrorism against the conservation movement by editing and transferring §1a-7b to the Chapter on Obstruction of Lawful Hunt in 16USC§5201 *et seq* to limit impairment of rights guaranteed to a person under the first article of amendment to the Constitution or limit any legal remedy for forceful interference with a person's lawful participation in speech or peaceful assembly under 16USC§5206, keeping in mind the text of Obstruction of Justice Rule 96 (Art. 134) of the Manual for Courts-Martial. Ask not what your country can do for you, ask how much wood, could a wood chuck, chuck and chip, if a wood chuck, could chuck and chip wood under 24USC§422, 24USC§423(b) and 54USC§302904?

## §11 Bureau of Indian Affairs

A. Indian Affairs (IA) is the oldest bureau of the United States Department of the Interior. Established in 1824, IA currently provides services (directly or through contracts, grants, or compacts) to approximately 1.9 million American Indians and Alaska Natives. There are 566 federally recognized American Indian tribes and Alaska Natives in the United States. Bureau of Indian Affairs (BIA) is responsible for the administration and management of 55 million surface acres and 57 million acres of subsurface minerals estates held in trust by the United States for American Indian, Indian tribes, and

Alaska Natives. Other programs administered through Indian Affairs include education, social services, natural resources management, economic development, law enforcement and detention services, administration of tribal courts, implementation of land and water claim settlements, replacement and repair of schools, repair and maintenance of roads and bridges, repair of structural deficiencies on high hazard dams, and land consolidation activities. There shall be in the Department of the Interior a Commissioner of Indian Affairs, who shall be appointed by the President, by and with the advice and consent of the Senate under 25USC§1. The 2018 President's budget for Indian Affairs is \$2.5 billion in current appropriations, \$303.3 million below the 2017 CR baseline level reflecting the need of decadent traitors to balance the budget by 2027. Indian Affairs outlays should be tribal government and welfare finance, not colonial enforcement bribery because the tribal police is paid in full by the tribal government. When the budget is stabilized the Bureau of Indian Affairs is due 3% growth for native Americans to defeat 2.7% inflation while government administration is marginalized at 2.5%; tribal offsetting receipts would go to 3% growth in health and education and 4% growth in spending on cash benefits to the poor. Because of BIA's unique capacity in the ID to provide a people with welfare, the FY18 budget cuts discriminate more against BIA than other ID agencies under threat of unjustified deprivation of relief benefits under 18USC§246.

1. A Section 1 agreement between the Secretary and the Tribal Government denotes a Self-Determination Contract (referred to in this agreement as the 'Contract'), is entered into by the Secretary of the Interior or the Secretary of Health and Human Services (referred to in this agreement as the 'Secretary'), for and on behalf of the United States pursuant to title I of the Indian Self-Determination and Education Assistance Act under 25USC§5301 *et seq.*) and by the authority of the \_\_\_\_\_ tribal government or tribal organization (referred to in this agreement as the 'Contractor'). A major national goal of the United States is to provide the quantity and quality of educational services and opportunities which will permit Indian children to compete and excel in the life areas of their choice, and to achieve the measure of self-determination essential to their social and economic well-being. Bureau of Indian Education (BIE) provides education services to approximately 42,000 Indian students. Programs administered by either tribes or Indian Affairs through the BIE include an education system consisting of 183 schools and dormitories located in 23 states for approximately 48,000 individual elementary and secondary students with a calculated three year Average Daily Membership of 41,333 students, and 32 tribal colleges, universities, tribal technical colleges, and post-secondary schools. The United States Census Bureau recently reported that between the years 2007-2011 approximately 27% of the American Indian and Alaska Native (AI/AN) population lived in poverty; a figure that exceeded the national poverty rate (14.3%) by over ten percentage points. But at least they get welfare benefits and aren't compelled to overexploit the land. According to the 2010 Census, 5.2 million people in the United States identified as American Indian and Alaska Native, either alone or in combination with one or more other races. Out of this total, 2.9 million people identified as American Indian and Alaska Native alone.

B. The Congress set the basic framework of Federal Indian policy in enacting the Trade and Intercourse Acts passed between 1790 and 1834. The central policy of the Acts was to subject all interaction between Indians and non-Indians to Federal control. The Acts prohibited non-Indians from acquiring Indian lands, except with the specific approval of the Congress. Trading with Indians was made subject to Federal regulation. The underlying objective of this early Federal policy was to protect Indians against incursions by non-Indians, since exploitation of Indians was one of the major causes of fighting and conflict between Indians and non-Indians on the western frontier. In fact, the War Department was established in 1784 with its primary mission to "negotiate treaties with the Indians" and with the armed

militia at the disposal of Indian commissioners. Over the next 50 years, laws regulating trade between non-Indians and Indians were enacted and a network of Indian agents and subagents was established. When trade restrictions proved ineffective in maintaining peaceful relations between Indians and their neighbors, the Indian Removal Act of 1830 institutionalized the forced removal of Indians. The most notable removal occurred among the Five Civilized Tribes, who were taken from their homes in the southeastern states, and marched along the infamous “Trail of Tears” to what is now Oklahoma.

1. By 1849, with the creation of the DOI, the BIA passed from military to civilian control, and its primary mission was to train Indian people for farming or trades. The General Allotment Act of 1887 was to assimilate the Indian by giving him/her individual ownership of Indian lands. In the nearly 50 years of the allotment period, Indian land holdings were reduced from more than 136 million acres to less than 50 million acres. As a result, the Congress passed the Indian Reorganization Act of 1934 to halt the allotment policy and create a foundation for tribal self- government. Tribes were urged to adopt elected democratic governments consistent with the concept of self-government. From 1953 to 1964, the Congress passed several bills terminating the special Federal relationship between several Indian Tribes and the United States to de-emphasize its custodial functions. However, in the mid-1960s the Federal Government abandoned termination in order to focus greater efforts on the development of both human and natural resources on Indian reservations. In 1970, President Nixon called for self-determination of Indian people without the threat of termination of the trust relationship over Indian lands. Since that date, self-determination has been the basis of Federal Indian policy as more operational aspects of Federal programs are transferred to tribal management. With the passage of the Alaska National Interest Lands Conservation Act (ANILCA) in 1980, the United States advanced the notion that national parks in North America can protect the homelands and lifestyles of indigenous peoples while conserving ecosystems.

C. In 2017, after slow pipeline protestors were water tortured in 20°F temperatures in 2016, Standing Rock Reservation was reported to have the most reduced life expectancy in the nation. The President, like the Standing Rock security contractors before him, rumored to have travelled from Ohio, must be impeached for treason regarding their levy for war and conspiracy to kill, kidnap, maim or injure persons or damage property in a foreign country under 18USC§956. The Federal Regulatory Energy Commission (FERC) must compensate Standing Rock tribal members under Art. 14 of the International Convention against Torture, Cruel, Inhuman and Degrading Punishment or Treatment. Standing Rock Reservation is due a crudely estimated \$100 million compensation by pipeline oil companies as a Policy statement on consultation with Indian tribes in Federal Energy Regulatory Commission (FERC) proceedings under 18CFR§2.1c. Compensation is due process for the violent and property crimes of water pollution, tipi toppling, pepper spray, rubber bullets, and water torture at 26 degrees Fahrenheit against a lawfully assembled civilian population, especially those protestors too old, fat and disabled to get away when the riot police toppled a bridge, in one massacre. The only obligation imposed upon the tribe by this \$100 million tribal fine is that they make a good faith effort to perfect *bona fide* claims to Trump Trail coast to coast, that run through their Reservation not far from Battle Mountain Sanitarium Reserve 24USC§153, by written agreement with the National Trail System Act of 1968 under 16USC§1246(h)(1). Use of force and territorial aggression by security contractors hired by pipeline companies trespassing on tribal watersheds protected by FERC pipeline rerouting decision of September 2016 is in contravention to the *jus cogens*, universal norm, of international law, the principle of non-use of force, in Art. 2(4) of the United Nations Charter. Standing Rock Reservation area was reported to have the most reduced life-expectancy in the nation in 2017. \$500 private law to pay for eternal life with Jackson County, Oregon \$250 Indian Memorial Rd. sign under *Lewis v Clark* (2017).

## §12 Bureau of Land Management

A. The Bureau of Land Management (BLM) is an agency within the United States Department of the Interior that administers more than 247.3 million acres (1,001,000 km<sup>2</sup>) of public lands in the United States which constitutes one-eighth of the landmass of the country. BLM estimates they manage 245 million surface acres, one-tenth of America's land base, and 700 million acres of subsurface mineral estate. BLM was established within the Department of the Interior in 1946 through the consolidation of General Land Office and U.S. Grazing Service. Created in 1946 through a government reorganization during the Truman Administration, the Bureau of Land Management (BLM) is the successor to the General Land Office (established in 1812) and the U.S. Grazing Service (originally called the Division of Grazing and renamed in 1939). It shall be the duty of such officers or employees of the Bureau of Land Management as may be designated by the Secretary of the Interior, in pursuance of instructions from the Secretary of the Interior or such officer as he may designate, to certify and affix the seal of the office to all patents for public lands, and to attend to the correct engrossing, recording, and transmission of such patents under 43USC§6. The Federal Land Policy and Management Act (FLPMA) of 1976 is the principal law defining the mission of BLM. There is a dual mandate under FLPMA, managing public land for multiple uses (such as energy development, livestock grazing, mining, timber harvesting, and outdoor recreation) while conserving natural, historical, and cultural resources, such as wilderness areas, wild horse and wildlife habitat, artifacts, and dinosaur fossils. The BLM's responsibility is to administer public lands on the basis of multiple use and sustained yield of resources. Public lands are to be retained in Federal ownership, unless as a result of the land use planning procedure, it is determined that disposal of a particular parcel will serve the national interest under 43USC§1701(1)(2) and (12) to promote the Mining and Minerals Policy Act of 1970 under 30USC§21a.

1. BLM land contains more than 174 million acres outside Alaska in the eleven Western states – more than 48 million in Nevada alone (60 percent of the state's total acreage) – but odd lots crop up in a number of Eastern states: 589 acres in Wisconsin, 12 in Illinois, 3,962 in Louisiana, for example. The Bureau of Land Management (BLM) is the chief administrator of public grazing lands on which some 21,000 ranchers graze 7 million cattle, sheep, and goats. It controls the leasing program for oil, gas, coal, oil shale, and geothermal sites and the administration of claims for gold, silver, iron, copper, lead, molybdenum, and uranium mining on its own lands as well as those on another 370 million acres of national forests and other federal land units. It manages 7.9 million acres of commercial forest, from which it produces about 1.22 million board feet of timber each year, most of it from a 2.1 million acre parcel in western Oregon once given to the Oregon and California Railroad and later taken back. Its domain includes 35 million acres of wetlands, 85,935 miles of fishable streams, and thousands of archaeological sites, petroglyphs, pictographs, and fossil remains. Finally, the BLM administers some 25 million acres of land that are potential additions to the National Wilderness Preservation System.

B. Modern BLM land conservation policy dates to the Antiquities Act of 1906 that preserves and protects prehistoric, historic, and scientifically significant sites on public lands under 43CFR§3.1 through the creation of national and international monuments under 16USC§431-450ss-7. National Historic Preservation Act of 1966 expands protection of prehistoric and historic properties. The Archaeological Resources Protection Act of 1979 requires permits for excavation or removal of these resources from Federal lands and sets criminal and civil penalties for violations. The Recreation and Public Purposes Act of 1926 allowed conveyance or lease of public lands to state and local

governments for outdoor recreation purposes. The Recreation and Public Purposes Act of 1954 amends the 1926 Act and allows the Secretary of the Interior the sale and lease of public lands for public purposes besides recreation under 43USC§869. During World War II 1941-1945 extensive withdrawal of public lands for military purposes began in 1942, with more than 13 million acres withdrawn in two years. Created in 1946 through a government reorganization during the Truman Administration, The Bureau of Land Management (BLM) was created in 1946 through a government reorganization during the Truman Administration . The BLM is the successor to the General Land Office (established in 1812) and the U.S. Grazing Service (originally called the Division of Grazing and renamed in 1939). The Wilderness Act of 1964 protects undeveloped Federal land to preserve its natural condition. Wild and Scenic Rivers and National Trails System Acts of 1968 preserves sites with outstanding natural, cultural, scenic, historic, and recreational significance. In 1965 the Land and Water Conservation Fund was established for Federal acquisition of outdoor recreation areas. The Endangered Species Act of 1973 required the conservation of threatened and endangered plants and animals and the ecosystems on which they depend.

1. The Classification and Multiple Use Act and the Public Land Law Review Commission Acts were both passed in 1964. The Classification and Multiple Use Act instructed the BLM to classify the public lands according to those that were suitable for disposal and those that were suitable for retention and management by the federal government under the principles of multiple use and sustained yield. By 1969 the BLM had classified 180 million acres, and recommended that almost 150 million be retained and managed another six parcels, amounting to 146,694 acres, were recommended for inclusion the new National Wilderness Preservation System; less than 5 million acres were recommended for disposal.

2. The National Environmental Policy Act (NEPA) signed by President Nixon on January 1, 1970. NEPA was enacted to: declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality in the White House in Sec. 2 of NEPA under 42USC§4321. By 1975 the BLM reported under the Taylor Act that only 17 percent of the federal range was in good condition, 50 percent in fair condition, and the remaining 33 percent in poor condition. The BLM needed an Organic Act.

3. The Federal Land Policy and Management Act (FLPMA) of 1976 placed the BLM on equal footing with the National Park Service and Forest Service. The FLPMA is BLM's legislative "charter" and repeals homestead laws and establishes policy of retaining public lands in Federal ownership. FLPMA requires that these lands be managed for multiple uses and sustained yield through land-use planning. Among other things the act repealed all public land laws, except the General Mining Law of 1872 and stated that the lands were to be retained for the long-term use of the American people unless "it is determined that the disposal of a particular parcel will serve the national interest". The lands were henceforth to be identified as the National Resource Lands and the BLM was directed to pursue multiple use, sustained yield goals, with land use planning as the cornerstone for management. The act also stipulated that the United States receive fair market value of the use of the public lands and their resources and that areas of critical environmental concern be designated to protect historic, cultural and natural values.

4. The Alaska Native Claims Settlement Act of 1971 provides for settlement of aboriginal land claims of Alaskan Natives and Native groups and tasked the BLM with the largest U.S. land transfer effort ever undertaken. In 1980 the Alaska National Interest Lands Conservation Act designates millions of acres of public land in Alaska as wilderness, national parks, national wildlife refuges, and wild and scenic rivers. Act also provides for subsistence use by rural Alaska residents. In 1980 the BLM completed its first resource management (land-use) plan, covering the California Desert Conservation Area, and designates its first areas of critical environmental concern in Utah and California. In 1984 some 300,000 acres of BLM land were added to the National Wilderness Preservation System. In 1985 the BLM received \$2.14 per acre to manage its 340 million acres, while the Forest Service received \$9.85 for each of its 191 million acres; the BLM had one field person for every 30,500 acres, the Forest Service one person for every 4,800 acres. In 1996 Grand Staircase-Escalante National Monument in Utah was designated by President, representing first such monument under BLM management. In 2000 a National Landscape Conservation System, consisting of wilderness areas, wilderness study areas, national monuments, and other conservation-related units on BLM-managed land, is established by Secretary of the Interior. Omnibus Public Land Management Act of 2009 officially authorized the National Landscape Conservation System and sets penalties for unauthorized removal of paleontological resources from Federal lands. BLM-managed lands were officially designated as the National System of Public Lands in 2008.

C. Stock Raising Homestead Act of 1916 authorizes homesteads of 640 acres and separates surface rights from subsurface (mineral) rights. Taylor Grazing Act of 1934 authorizes grazing districts, regulation of grazing, and public rangeland improvements in Western states (excluding Alaska) and establishes Division of Grazing (later renamed U.S. Grazing Service) within the Department of the Interior. The Wild Horse Protection Act of 1959 (also known as the "Wild Horse Annie Act") prohibits hunting of wild horses and burros on public land by aircraft or motor vehicles. The Wild Free-Roaming Horses and Burros Act of 1971 mandates protection and management of these animals on public lands managed by the BLM and U.S. Forest Service. The Public Rangelands Improvement Act of 1978 requires inventory, determination of trends, and improvement of public rangelands.

1. Mineral Leasing Act of 1920 authorizes Federal leasing of public lands for private extraction of oil, gas, coal, phosphate, sodium, and other minerals. The Outer Continental Shelf Lands Act of 1953 authorized Secretary of the Interior to lease mineral lands more than three miles offshore. Multiple Surface Use Act of 1955 withdraws common varieties of minerals from entry as mining claims and allows claim owners to use the surface for mining operation purposes only. The Energy Policy and Conservation Act of 1975 addressed energy demands and establishes a strategic petroleum reserve. In 1976 the Management of the National Petroleum Reserve in Alaska was transferred from the U.S. Navy to the BLM. The Surface Mining Control and Reclamation Act of 1977 ensures environmental safeguards for mining and reclamation of mined areas. In 1983 the BLM transferred responsibility for offshore leasing to the Minerals Management Service. The Federal Onshore Oil and Gas Leasing Reform Act of 1987 established a new leasing system and changes certain operational procedures for onshore resources on Federal lands.

2. Oregon and California (O&C) Revested Lands Sustained Yield Management Act of 1937 requires O&C Railroad lands to be managed for permanent forest production and provides for watershed protection, regulation of streamflow, and recreational facilities. In 1990 the Northern spotted owl was listed as a threatened species under the Endangered Species Act, leading to enjoinder of all Federal timber sales within its range.

### §13 National Park Service

A. The success of the United States' venture in parks has encouraged the establishment of more than 1,200 national parks in over one hundred countries. The 334 units of the U.S. national park system, encompass 89 million acres. The forty-eight national parks cover about 47 million acres. Park visitation has risen tenfold since 1950 and by the 1990s the national parks were subjected to as many as 400 million total visits every year. Between 1804 and 1870 there were 110 scientific explorations west of the Mississippi River. The national park system began in 1832 when Congress withdrew the region of Hot Springs, Arkansas, from appropriation by the various land laws and declared it the first natural federal preserve for the medicinal value of its hydrotherapy under 24USC§20 and 16USC§361 *et seq.* Title 54, National Park Service and Related Programs was made law by Pub. L. 113–287, §6(e) on Dec. 19, 2014, 128 Stat. 3272. Chapter 1 National Parks of Title 16 Conservation was mostly repealed and to suppress terrorism the Presidential dispute regarding the right to bear arms under 16USC§1a-7b must be repealed or transferred with Trump's opinion on lawful hunts in the National Wildlife Refuge system to the Chapter on Obstruction of Lawful Hunt 16USC§5201 *et seq.* Ask not what your country can do for you, ask how much wood, could a wood chuck, chuck and chip, if a wood chuck, could chuck and chip wood under 24USC§422, 24USC§423(b) and 54USC§302904?

1. On March 1, 1872 Congress created Yellowstone National Park as “a public park or pleasuring ground for the benefit and enjoyment of the people” without appropriating money for its protection. For the first five years Superintendent Nathaniel Landford donated his time and services, without the authority to detain or discipline vandals and poachers who were evicted, for twenty-two years. Poaching reduced the buffalo herd from 541 to twenty-two before Congress appropriated funds to buy domesticated specimens to breed with the remaining wild ones. Machinac Island National Park in Michigan was established in 1875, and twenty years later turned over to Michigan. In 1882 Congress decided, no longer could park forests be logged arbitrarily, or could construction take place within one-quarter of a mile of the park's most important wonders. On August 17, 1886, Troop M of the United States Calvary rode into Yellowstone and relieved the civilian superintendent of his duties. For thirty-two years, the military, by all accounts, did an excellent job. Army supervision was later established in Yosemite, Sequoia, and General Grant parks as well, and in the performance of their duties the military park rangers even earned the praise of John Muir, who died in 1914, at the first outbreak of WWI draft dodgers, who said, “In pleasing contrast to the noisy, ever-changing management or mismanagement of blustering, blundering, plundering, moneymaking vote sellers...the soldiers do their duty so quietly that the traveler is scarcely aware of their presence”. In 1890 Yosemite, Sequoia and General Grant (later incorporated into Sequoia) national parks were established within days of one another. Sequoia and General Grant were known primarily as “tree parks” to stop the vandalism of the world's largest tree *Sequoiadendron giganteum*.

2. Slowly in a piecemeal fashion, the system grew: Mount Rainier, 1899; Crater Lake, 1902 (Judge William Gladstone Steel funded the park himself and served as its superintendent without pay); Mesa Verde, 1906; Petrified Forest, 1906; Grand Canyon, 1908; Zion, 1909; Olympic, 1909; Glacier, 1910; Rocky Mountain, 1915; Hawaii Volcanoes, 1916. By 1916, twenty national monuments had been declared by Presidents Roosevelt, Taft, and Wilson, by executive order. In 1914 Interior Secretary Lane hired an old classmate of his named Stephen Tyng Mather, a forty-seven-year-old millionaire who traced his ancestry to Cotton Mather, who had spent twenty-two years in the borax business, to be his assistant in charge of the parks. The first order of business was to get a National Park Service bill

through Congress. Mather wined and dined Congress members in the parks and published an elegant book, the *National Parks Portfolio*, which was distributed free of charge to 250,000 people by the General Federation of Women's Clubs. In 1916 Congress passed and President Woodrow Wilson signed the Act to create the National Park Service "to conserve the scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. Before illness forced his retirement in 1929 (he died in 1930), he doubled the size of the park domain from 7,500 to 15,846 square miles by adding seven new parks and thirteen new monuments to the system, with increasingly larger budget appropriations. Even without adequate roads, automobiles in great numbers were soon rumbling through most of the parks – only some ten thousand vehicles a year at first, but by 1919 the number had soared to 98,000. Those who arrived by car outnumbered by four to one those who arrived by train.

3. A search committee scoured the Eastern and Southern regions in the early 1920s and finally came up with two worthy possibilities in the Appalachian Mountains: the Shenandoah Valley in Virginia and the Great Smoky Mountains in Tennessee and North Carolina. In 1925 Congress stated its intent to establish these two parks in the East, provided that the states involved could raise the money to purchase the necessary private lands. The Shenandoah, which covers about 195,000 acres along the crest of the Blue Ridge Mountains, was authorized by Congress in 1926 but was not fully established until 1935, by which time the state of Virginia had bought some seven hundred private land holdings in the area. The money for the purchases came from donations large and small. Schoolchildren gave their allowance to the cause. Authorization to dedication of Great Smoky Mountains National Park took almost fourteen years, even though its half-million acres of private land were acquired with the help of John D. Rockefeller, Jr. through the Laura Spelman Rockefeller Memorial. Rockefeller offered \$5 million in honor of his mother, and his donation was matched by smaller contributions from the states of North Carolina and Tennessee.

4. After Mather's departure in 1929, the directorship fell to his colleague and protégé, Horace Albright, a history buff, for a four year term. After a brief conversation during an automobile ride with Albright, President Franklin Roosevelt transferred jurisdiction of all memorials, military cemeteries, battlefields, and numerous other sites to the National Park Service, i.e. the Statute of Liberty, and Antietam. Before 1931, Park Service funds were used for in-park road construction and maintenance only. After that year, the Park Service was authorized to spend part of its appropriations on "approach roads" outside the parks, to reduce the burden on states. The legacy of promotion and expansion held strong even during the Depression, when the new Park Service director, Arno Cammerer, was forced to cut his budget to \$5 million – half that of previous years. The Civilian Conservation Corps (CCC), did an enormous amount of fix-up work in both the national forest and national parks. By some estimates the 118 camps operating in the parks did the work of fifty years in only ten. The CCC built roads, trails, and campgrounds. It cleared trees and planted them. The CCC boys performed, hard, clean work under a program considered to one of Roosevelt's greatest New Deal successes. CCC road building was offensive to many preservationists, but not to park officials, who stood by their ambitions to have roads constructed to and through as many parks as possible. In spite of criticism from conservation groups, the Park Service, continued to steer an expansionist course. Beginning with Lake Meas in 1935, when the reservoir began filling up behind the newly built Hoover Dam, the Park Service was assigned responsibility for such man-made recreation areas. The Park Service also became more interested in adding seashores to its domain. In 1937, Cape Hatteras National Seashore, in North Carolina, was the first to be authorized, with the slow and costly job of private land acquisition left up

to the state. Cammerer retired in 1940, his health broken by six years of work without a day off in the first five, and Newton Drury assumed the directorship.

5. World War II placed severe demands on the parks. Copper was extracted from the Grand Canyon, manganese from Shenandoah, and Yosemite yielded a meager fifty-five tons of tungsten. The most serious threat faced was to Olympic National Park's Sitka spruce. Timber interests had fought the designation of the park in the 1930s, but with the war effort, loggers claimed the Sitka spruce were essential for building airplanes. The War production Board agreed, and recommended that the Sitka spruce be cut and used for defense. Director Drury resisted, however, and Secretary Ickes supported him, with the statement that "the virgin forests in the national parks should not be cut unless the trees are absolutely essential for the prosecution of war, with no alternative, and only as a last resort. Critical necessity rather than convenience should be the governing reason for sacrifice of an important part of our federal estate. The Park Service then found healthy stands of spruce in Canada and Alaska, shortly after which aluminum replaced wood in most aircraft construction anyway.

6. After the war, the public returned to the parks by the millions – 30 million a year by 1950. But roads and services had remained at 1940 levels. Congress approved a major financial commitment, an \$800 million to \$1 billion appropriation for a program of improvement and expansion, dubbed "Mission 66" in honor of the year it was scheduled to be completed. However, Mission 66 could not keep up with the numbers; in just four years, visitation jumped to 72 million a year and the projected figure of 80 million visits was reached and passed long before the anniversary year of 1966. Fifteen new recreation areas were designated in this period, and in 1961, 27,000 acres of the Cape Cod shore were added to the park system, closely followed by significant additions at Point Reyes in California and Padre Island in the Gulf of Mexico, just off the coast of Texas. Of the 23.8 million acres of national park natural areas in existence in 1964, 22.9 million had been reserved before World War II. Congress broke with its long-standing tradition of not appropriating funds for land acquisition and, in 1964, passed an act creating the Land and Water Conservation Fund (LWCF) to ensure that money would always be available for such purchases; funding would come from the sale of excess federal property, from park entrance and permit fees, from a tax on motorboat fuel, and, after 1968, from receipts for oil and gas leases on the outer continental shelf, which now amount to about 90 percent of the \$900 million in annual income to the fund. Since 1964 the LWCF has served as the source for nearly all parkland purchases including those necessary for the creation of Redwood National Park in 1968, the largest addition to the system since the Great Smoky Mountains in the 1930s. Urban parks were also added, among them Delaware Water Gap National Recreation Area, Fire Island National Seashore, Indiana Dunes National Lakeshore, in the 1960s.

7. In the 1970s Golden Gate National Recreation Area, around San Francisco; Gateway, in the environs of New York City; Cuyahoga Valley, between Cleveland and Akron; Chattahoochie River, near Atlanta; Santa Monica Mountains, near Los Angeles; and Jean Lafitte National Historical Park and Recreation Area, scattered in and around New Orleans. In the 1970s controversy surrounding the construction of the Trans-Alaskan Pipeline had accelerated concerns over the future of Alaska lands, that was ultimately expressed in passage of the Alaska National Interest Lands Conservation Act (ANILCA) in 1980 after numerous executive actions to create, millions of national monuments. ANLCA firmly embedded more than 43 million acres in the national park and monument system. President Carter was the most conservation-minded President since Franklin Roosevelt, while Ronald Reagan is characterized as the least conservation-minded President since Dwight D. Eisenhower.

8. By 1980 visitations to the national parks had increased to more than 300 million a year, with the heaviest use concentrated in such Eastern parks as Shenandoah, which in 1980 received 7.5 million visitors, while Yellowstone and Yosemite each received about 2 million. In some parks, roads and sewage systems needed repair and many park buildings were declared “hazards”. It was estimated to cost \$1.6 billion to make the necessary capital improvements and acquiring new lands would be irresponsible if the old ones were not repaired first. The estimate was later reduced by half a billion dollars and Congress refused to permit LWCF money to be used in any way other than for acquisition. Before the budget crunch of 1985, brought it to a halt, the agency managed to spend \$800 million.

B. From the beginning of the Park Service concession had worked as closely supervised monopolies in the parks. For example, the Curry Company, was a family-run concession in Yosemite that served the park for three generations. But in the 1960s and 1970s, concession management began to change, particularly in the major parks, where small family operations such as the Curry’s were bought out by conglomerates. Music Corporation of America, a subsidiary of Universal Studios, acquired the Curry Company in 1973. Amfac, a sugar conglomerate, became the concessioner for most of the Grand Canyon National Park, and Trans World Corporation took over operations in Bryce Canyon, Zion and part of Grand Canyon. Large concessioners gained more control over the parks by the passage of the Concessioners Policy Act of 1965, which permitted operators to have “possessory interest” in all facilities within the parks. This differed from outright ownership, in that if Park Service administrators were dissatisfied with a concessioner, the agency could not cancel the agreement without simultaneously buying out all concessioner-owned capital improvements at current market value. The most dramatic example of a forced buyout took place in Yellowstone in 1979. General Host, a concessioner for eleven years, had let conditions deteriorate because it did not want to spend the \$10 million on improvements it had previously promised to make. Conditions in the park were too deplorable to be ignored and staff morale was so low it could not be missed by park visitors. The Park Service terminated the contract, paying General Host almost \$20 million for that privilege.

1. The region known as the Golden Circle of the Southwest encompasses Grand Canyon, Canyonlands, Bryce Canyon, Capitol Reef, and Arches national parks, and Lake Mead and Glen Canyon national recreation areas. Visibility within the Golden Circle has been reduced from sixty to forty miles, largely because of all the power plants in the area. The Four Corners power plant at Farmington, New Mexico, has been called the “stacks of death” because it disperses about 80,000 tons of sulfur dioxide a year into the Colorado Plateau area. Emissions from the Navajo Power Plant near Page, Arizona, has on occasion filled the Grand Canyon with a layer of haze, reducing visibility to less than fifteen miles and obscuring the opposite rim. Astronauts orbiting the earth in 1965 aboard the Gemini III capsule, reported that the only signs of human life they could detect were plumes of smoke from its towering stacks. The Everglades, more than two thousand miles from the Golden Circle, was dubbed the most highly threatened national park in the entire system. The increasing use of Florida’s water for agriculture and urban and industrial development had dramatically altered the park’s water cycle, vital to the maintenance of the Everglades ecosystem. The populations of some wading birds decreased by 90 percent over fifty years.

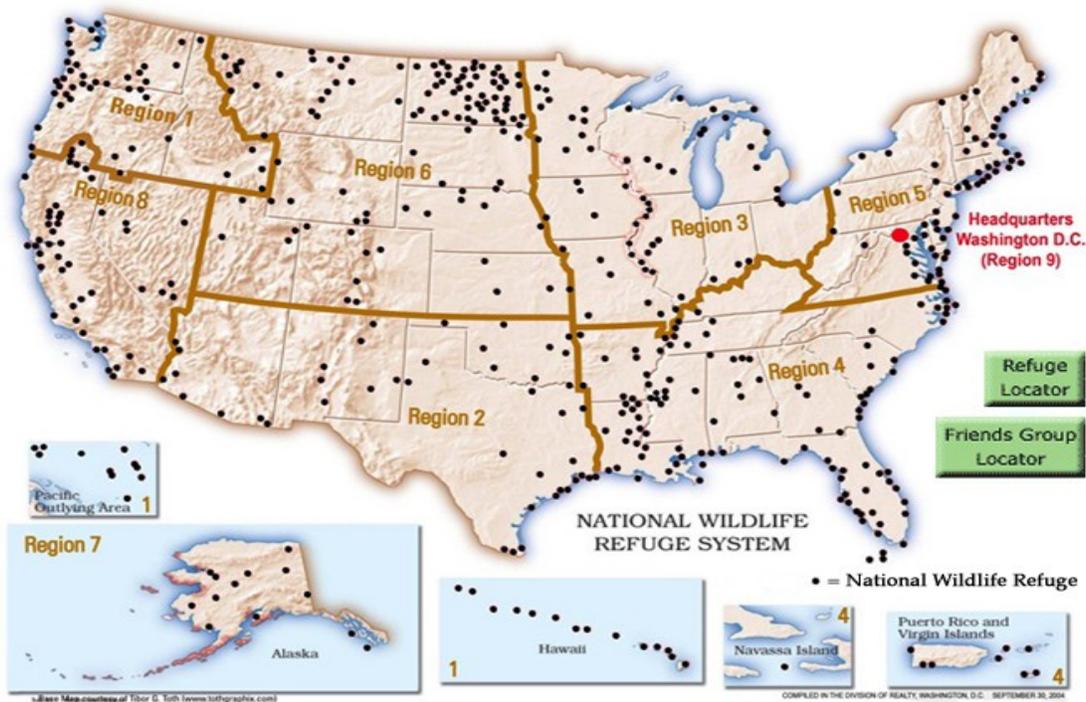
C. *State of the Parks*, published by the National Park Service in 1980, at the prompting of a bipartisan Congressional request, identified 4,345 threats to park integrity, more than half of which originated outside the parks. Threats were divided into seven categories: aesthetic degradation, air pollution, extraction of resources, encroachment of exotic animal and plant species, visitor impacts, water-quality pollution, and park operation, including the use of biocides. The National Park System Protection and

Resources Management Act, also called the Park Protection Act, was subsequently introduced passed in the House in two different Congresses, only to be blocked in the Senate, sought to track conditions of the natural and cultural resources. Park visitation has risen tenfold since 1950 and by the 1990s the national parks were subjected to as many as 400 million total visits every year. The Land Water Conservation Fund (LWCF) is authorized a ceiling of \$900 million annually for park acquisition. There are approximately 24,000 privately owned “inholdings” checker-boarding the national park system. Many thousand of these have already been authorized for purchase, and many thousands more should be acquired. If outright purchase is impossible alternative such as “life estate” purchases in which the current resident of the property is allowed to live on the land until death; scenic and conservation easements, in which the land is preserved from any sort of development that will degrade the resource in any way, even while under private ownership; and restrictive zoning in cooperation with state and local governments. Purchase is always preferred and this can be accomplished through a declaration of taking.

1. There are a number of areas left in the lower forty-eight states that are deserving of park status. Candidate areas include a Grasslands National Park in Montana, a Tallgrass Prairie National Park in Kansas/Missouri, a Great Basin National Park in Utah/Nevada, a Big Sur National Seashore or National Park in California, and a Bioluminescent Bay National Park in Washington. Ever since the passage of the Surface Transportation Assistance Act of 1982, there has been an uncommonly extensive amount of road work done in many parks; some roads have been widened, regarded, and otherwise improved to the point that the reconstruction has significantly degraded the park environment and the park experience. It is held that a system-wide moratorium should be put into effect by the Park Service on all such road building activities, and a thorough review with public involvement, should be conducted. Of special concern are Olympic, Crater Lake and Shenandoah national parks. The National Forest lands shall be brought under national, state and county park supervision by pedestrians who stay on the National Trail System Act of 1968.

#### **§14 National Wildlife Refuge System**

A. The National Wildlife Refuge System Act of 1966 set the Fish and Wildlife Service (FWS) to provide, preserve, restore and manage a national network of lands and waters sufficient in size, diversity and location to meet society’s needs for areas where the widest spectrum of benefits associated with wildlife and wildlands is enhanced and made available. The National Wildlife Refuge System is 90 million acres, exceeding the size of the national park system, although all but 13 million of its acres lie in Alaska. Of the 408 refuges outside of Alaska, 65 percent are west of the Mississippi River. Over 90 percent of their lands were withdrawn from the public domain. The system operates in seven different biomes, characterized by distinct communities of soil types, vegetation, and animals. Refuges were described as islands of habitat once widespread within each biome. The system is composed of 424 wildlife and waterfowl refuges, plus an assortment of related sites for waterfowl production. On these lands dwell at least 220 species of mammals and 260 species of amphibians and reptiles, 63 of which are endangered. More than 600 of the 813 bird species found in the United States spend at least one season within the refuge system. Many of the bird refuges are along the four major north-south migratory routes, the Atlantic, Mississippi, Central and Pacific flyways. Other refuges have been established to preserve the habitat primarily for an individual species, such as the elk at the National Elk Refuge in Jackson, Wyoming, or to reintroduce a species to an ancestral or otherwise suitable territory.



B. Since the development of modern wildlife management in the 1930s, no American wildlife has been exterminated by sport hunting. Refuges record more than 30 million visits a year. Nearly 80 percent of visitation takes place on only forty of the existing 424 refuges. Chincoteague National Wildlife Refuge in Maryland and Virginia for example, receives about one million visitors a year. FY 1984 the nation spent \$90 million for on-site care of the whole Wildlife Refuge System. The Fish and Wildlife Service (FWS) employed 5,200 people, 1,500 of whom work on refuges, although only about 960 people were actually stationed on the refuges. FWS runs the national fish hatcheries, conducts law-enforcement programs, administers the Endangered Species Act (ESA) along with more than 150 other acts of Congress (or portions of them), oversees animal damage control, conducts wildlife research, manages migratory birds in association with international treaties, evaluates the impacts of public works projects on wildlife, administers grant programs for state wildlife agencies and provides technical assistance on wildlife matters to nearly anyone who asks for it.

1. Habitats for many species are under great pressures from urban, industrial, and agricultural expansion, recreational use, and economic development. 300,000 acres of wetland habitat is lost every year. Between 1955 and 1975 more than 15,000 acres of estuarine subtidal habitats were lost in the Atlantic Flyway because of urban development; 1.5 million acres of forested wetland habitat were lost in the Mississippi Flyway, 10,000 acres of estuarine habitat were lost from the coasts of Texas and hundreds of thousands of acres of prairie wetlands were lost in the interior states. 652,000 acres, or 5 percent of total refuge acreage in the lower forty-eight states have been designated wilderness, but 3.4 million more additional acres remain undesignated although FWS recommended. The Alaska National Interest Lands Conservation Act (ANILCA) of 1980 created sixteen Alaskan refuges that total 76 million acres.

2. Habitat disappeared under the implacable assault of the westward-moving pioneers, and it went the

wildlife. The Eastern beavers vanished, as did Eastern wolves when predation of domestic livestock brought eradication down upon their packs. Salmon runs were blocked by dams for gristmills and sawmills. The million-winged flocks of passenger pigeons dwindled, then disappeared. The heath hen, the Labrador duck, the great auk, the Carolina parakeet, the eastern cougar, grasses, plants, wildflowers, trees...gone or so depleted as to border on extinction. In 1867, Buffalo Bill Cody was hired by the Kansas Pacific Railway to provide fresh meat for the gandy dancers. In eighteen months he killed more than 4,280 American buffalo (*Bison bison*). State made some progress toward establishing a framework of game management by restricting certain hunting practices. When the Revolutionary War began, twelve colonies had closed hunting seasons. In 1850 Massachusetts and New Hampshire appointed the first game wardens. In that same year Connecticut and New Jersey passed laws protecting nongame birds such as songbirds, and Iowa introduced the first bag limit of twenty-five prairie chickens per person per day. Arkansas, in 1875, was the first state to outlaw commercial hunting. By 1880 all states had game laws of one sort or another. States had the right to control and regulate the common property in game, a right to be exercised as a trust for the benefit of the people. In 1871 the Bureau of Fisheries was organized in the Department of Commerce to regulate ocean-based fishing operations.

3. The Yellowstone Park Protection Act of 1894 made it a crime to kill wildlife or remove it from the park. The act banned not only hunting, but any human activity that might upset the existence of wildlife. In 1900 the Lacey Act prohibited the transportation of any wild animals or birds killed in violation of state law and authorized the Secretary of Agriculture to preserve, distribute, introduce, and restore game birds, subject to state law. In 1906 Congress declared it illegal to disturb birds on any federal lands set aside as breeding grounds for birds (or other animal) by law. Roosevelt created fifty-one refuges before leaving office in 1909. In *Missouri v. Holland* Justice Oliver Wendell Holmes wrote, but for the treaty and the statute, there soon might be no birds for any powers to deal with. The Bureau of Biological Survey and its Canadian counterpart wrote regulations that restricted most of the destructive uses of migratory birds. The sale of game birds covered by the treaty was prohibited, spring shooting and night shooting were outlawed, and bag limits were reduced. Certain species, such as wood ducks and trumpeter swans, were off limits to all hunters, and the use of weapons of mass destruction was abolished. As more was learned about flight patterns and nesting preferences of birds, treaties protecting other species were drawn between the United States and Mexico, Japan and the Soviet Union.

4. The Migratory Bird Conservation Act of 1929 established a commission to review and approve acquisitions of additional refuge lands. These refuges were to be managed as inviolate sanctuaries. No refuges were bought as the result of the Depression and the waterfowl situation deteriorated until the number of ducks in the fall migration sank to about 30 million from a previous population of 120 million. Under the Duck Stamp Act of 1934 in exchange for the right to hunt on non-refuge lands, hunters would pay one dollar for the stamp. Proceeds would be used to purchase new refuge lands. In 1934 the Fish and Wildlife Coordination Act required public works administrators to assess the impact on wildlife of such projects as dam-building and reclamation. The Pittman-Robertson act of 1937 gave the states funds to establish their own refuges, and perpetuated the two-tiered approach to wildlife management. Matters improved still more with the Reorganization Act, when the Bureau of Fisheries in the Department of Commerce and the Bureau of Biological Survey in the Department of Agriculture were consolidated into a single agency and transferred to the Department of the Interior. The new agency was called the U.S. Fish and Wildlife Service (FWS). In 1949 FWS officials lobbied to raise the price of the Duck Stamp from one dollar to two, promising to open 25 percent of each refuge to

hunting and later, in exchange for a three-dollar stamp, to open 40 percent to hunting. In 1956 the Bureau of Sport Fisheries and Wildlife, and responsibility for commercial fishing was vested in the Bureau of Commercial Fishing. The two agencies were given equal billing within a third entity called the Fish and Wildlife Service (FWS).

C. The current legal threat to wildlife habitat is that Chapter 1 National Parks of Title 16 Conservation was mostly repealed and to suppress terrorism the Presidential dispute regarding the right to bear arms in lawful hunts on National Wildlife Refuge under 16USC§1a-7b must be repealed or transferred with Trump's opinion on lawful hunts in the National Wildlife Refuge system to the Chapter on Obstruction of Lawful Hunt 16USC§5201 et seq. There are a number of reasons why §1a-7b is unlawful (1) It incites genocide against the Fish and Wildlife Service. (2) Philosophical defiance of the principle of non-use of force, *jus cogens* of international law, in regards to the slaughter involved in animal meat consumption by humans, has assumed a position of supremacy in Title 16 Conservation. (3) Extra-territoriality is exhibited by the fact that although the President's happy hunting grounds are designated to be in the National Wildlife Refuge System by §1a-7b Chapter 1 is delegated to the National Parks. There is no denying that §1a-7b is unconstitutional, but so is the United States' unique first amendment threatening second amendment legally remedied to prevent forceful interference with a person's lawful participation in speech or peaceful assembly under 16USC§5206. The President is therefore highly encouraged to suppress terrorism by editing section §1a-7b for Obstruction of Justice Rule 96 (Art. 134) of the Manual for Courts-Martial and transferring it to the Chapter on the obstruction of lawful hunt 16USC§5206 et seq.

## **§15 National Forests of State and County Park Jurisdiction**

A. The United States has 154 protected areas known as National Forests covering 188,336,179 acres (762,169 km<sup>2</sup>/294,275 sq. mi). The USDA Forest Service, exploits these lands with a budget of \$5.7 billion FY 17 and \$5.3 billion FY 18 employs 33,000 employees and has responsibility for more than 191 million acres of public land. National Forests and Grasslands provide Americans with 193-million spectacular acres of wildlands. 9,126 miles of scenic byways to drive, 148,295 miles of trails to hike, 4,418 miles of wild and scenic rivers to float, 5,107 campgrounds to pitch tents, 1,200 boating sites and 328 natural pools to swim in. The 193 million acres of National Forests include 35.2 million acres of designated wilderness and more than 4,400 miles of national wild and scenic rivers, plus some 23,000 recreational facilities. These lands contain more than 10,000 plant species, more than 3,000 animal species, more than 400 of the nation's 1,312 (2007) federally listed threatened or endangered plant and animal species, and some 2,900 species designated as "sensitive" because their welfare is in doubt.

1. The national forests and grasslands also provide domestic water worth billions of dollars for sixty million people in the continental United States, and they constitute 8.5 percent of the nation's land area. In addition to timber, these lands also provide grazing for livestock, sport and commercial fishing, sport and subsistence hunting and gathering, as well as valuable energy and mineral deposits. FS land holds an estimated fifty billion tons of coals, plus oil, gas, geothermal energy, precious metals, and other minerals. Some six million acres of FS land are leased for energy production and there are 150,000 mining claims on its property. USFS also permits roads, highways, trails, transmission lines, telecommunication facilities, and ski resorts in the national forests and allows hunting, boating and fishing. In 2003, more than thirty-seven million Americans used motorized off-highway vehicles, many on FS land. In 2003 the Forest Service allowed 248,000 acres to be logged and 3 million to be burned.

B. Overall, the USFS uses its annual net spending (\$5.5 billion FY 2006, compared to \$4.13 billion FY 2008) to manage 191 million acres divided into 155 national forest in forty-four states, Puerto Rico and the Virgin Islands, including nine million acres of wetlands and riparian areas, along with twenty national grasslands totaling four million acres. The Forest Service spends nearly \$2 billion a year on fire-suppression and related aviation activities. An estimated 40 percent of the USFS's total appropriations are devoted to planning, analysis and resolution of legal and administrative challenges. The National Forests will be a lot safer without the Forest Service. Hiking, backpacking, family camping, fishing, hunting, swimming, boating – Americans annually spend 235 million days of recreational time in national forests compared to 400 million days in national parks. The high mountain meadows and grasslands of the national forest system support 1.4 million cattle and 1.3 million sheep every year. The average price charged for permits to graze these animals on the public land is \$1.35 per animal-unit-month (AUM – the amount of forage needed to support one cow of five sheep for one month). In 1982, grazing fees brought in only thirty-eight cents for every dollar spent on grazing management, a reflection of reduced grazing fees and not a reduction in grazing use. The national forest system is 191 million acres in size, comprising about 18 percent of the remaining commercial forestland in the country, with 153 individual national forests and eighteen grassland units in forty states.

1. The national forests cloak the slopes of nearly every major mountain range: Alaska's Chugach and Tonbass; the Far West's Cascades, Coast Range, Sierra Nevada, and Siskiyou; the arid West's Rockies; the central region's Black Hills, Ozarks, and Ouachitas; the Northeast's White Mountains and Green Mountains; the South's Appalachians. In the mountains rivers are born of rain and snowmelt, the lifeblood of hundreds of small towns and large cities. In the Intermontane West, where rainfall is scarce, 85 percent of all water originates on 25 percent of the land, that is located within the boundaries of national forests. Water and earth, along with trees and grass, are only the most visible resources of national forests. Additionally, they contain deposits of nonreplenishables such as gold, silver, chromium, molybdenum, nickel, tungsten, copper, and zinc. Other uses include outdoor recreation, range, timber, watershed, and wildlife and fish habitat. Fourteen thousand ranchers graze 7 million sheep and cattle on the forest ranges, while more than 70,000 individuals or groups have been granted special-use permits for their television transmission stations, ski slopes, reservoirs, lodges, camps, and even public schools where land in adjacent towns is in short supply. County, State and National Parks services need to take responsibility for National Forest Special Use Permits under 54USC§103104.



2. The national forests include 35.2 million acres of designated wilderness and more than 4,400 miles of national wild and scenic rivers, plus some 23,000 recreational facilities. These lands contain more than 10,000 plant species, more than 3,000 animal species, more than 400 of the nation's 1,312 (2007) federally listed threatened or endangered plant and animal species, and some 2,900 species designated as "sensitive" because their welfare is in doubt. The 193 million acres of national forests and grasslands also provide domestic water worth billions of dollars for sixty million people in the continental United States, and they constitute 8.5 percent of the nation's land area. In addition to timber, these lands also provide grazing for livestock, sport and commercial fishing, sport and subsistence hunting and gathering, as well as valuable energy and mineral deposits. FS land holds an estimated fifty billion tons of coals, plus oil, gas, geothermal energy, precious metals, and other minerals. Some six million acres of FS land are leased for energy production and there are 150,000 mining claims on its property. USFS also permits roads, highways, trails, transmission lines, telecommunication facilities, and ski resorts in the national forests and allows hunting, boating and fishing. In 2003, more than thirty-seven million Americans used motorized off-highway vehicles, many on FS land.

3. The USFS is formally committed to using an "ecosystem approach to management that integrates ecological, economic, and social factors to maintain and enhance environmental quality to meet current and future needs", thus pledged to ensure "sustainable ecosystems by restoring and maintaining species diversity and ecological productivity". The Forest Service, employs more than fifty thousand contractors, who need to be fired for arson, and has responsibility for more than 191 million acres of public land, that is forfeit to the national park service for fire safety. The National Forest Management Act makes clear, the United States has both a responsibility and an opportunity to be a leader in assuring that the nation maintains a natural resource conservation posture that will meet the requirements of our people in perpetuity.

C. The federal forest reserves were transferred from the Department of the Interior to the Department of Agriculture's Bureau of Forestry in 1905 after a long campaign by then bureau head Gifford Pinchot, an intimate friend of President Theodore Roosevelt and an early protégé of Muir. The Bureau of Forestry was renamed the U.S. Forest Service (USFS) in 1905, and the reserves were renamed national forests in 1907. By 1907, Roosevelt, under Pinchot and Muir's influence, set aside 100 million additional acres as national forests, mostly in the West. The Weeks Act of 1911 extended the forest reserves to the East, where most of the timber had already been cut. The act was passed to accomplish flood and fire control and watershed protection, as well as out of a desire to secure recreational opportunities on public lands. William Howard Taft retained Pinchot in 1909 but fired him for insubordination in 1910 after triggering a Senate investigation into alleged improprieties regarding the leasing of Alaskan coal lands. Pinchot returned to Pennsylvania, entered politics, became governor and considered running for President, and remained a potent force for conservation and forestry until his death in 1948. Henry Solon Graves, dean of the Yale Forestry School, replaced Pinchot. Not more than 5 percent of the nation's supply of timber came from the national forests in any year, and all timber sales were restricted to those needed for forest custodial reasons, but Graves hoped the Forest Service could one day be self-sufficient, if the Forest Service stopped all noncustodial timber operations and ignored the importance of watershed protection. Conflict with Stephen Mather's new National Park Service occupied forestry officials. With almost every new national park that came along, some national forestland was transferred from Agriculture's multiple use department, the Forest Service, to the Interior's preservation department, the Park Service. The Forest Service began to promote the national forest's recreational opportunities and in 1929 the agency began to designate parts of national forests as primitive, which meant they were left alone as much as possible.

1. The principal forest service authorizing statutes governing management on the national forests: The Organic Administration Act of 1897 authorizes the Secretary of Agriculture to establish regulations governing the occupancy and use of the national forest and to protect the forests from destruction. The Knutson-Vandenburg Act of 1930 under 16USC§579-576b, as amended by the National Forest Management Act of 1976 under 16USC§472a) directs the Secretary of Agriculture to provide for the improvement of the productivity of renewable resources within national forest system timber sale areas. The act also authorizes the collection and use of timber receipts for these purposes. The Small Business Act of 1953, as amended at 15USC§644 provides for agencies to participate in programs with the Small Business Administration. This is the authority for the Small Business Timber Sale Set-Aside program (FSM2439). The Multiple-Use, Sustained Yield Act (MUSYA) of 1960 under 16USC§528-531 recognizes timber as one of five major resources for which national forests are to be managed. This act further directs the Secretary of Agriculture to develop and administer the renewable surface resources of national forests for multiple use and sustained yield of the many products and services obtained from these resources. The National Forest Roads and Trails Systems act of 1964 under 16USC§532-538 directs the Secretary of Agriculture to provide for the existence of an adequate system of roads and trails within and near national forests. The National Environmental Policy Act (NEPA) of 1969 under 16USC§4321 requires agencies to analyze the physical, social and economic effects associated with proposed plans and decisions, to consider alternatives to the action proposed, and to document the results of the analysis.

2. The Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 under 16USC§1600-1614 as amended by the National Forest Management Act of 1976, directs the Secretary of Agriculture to assess periodically the forest and rangeland resources of the nation and to submit to Congress at

regular intervals recommendations for long-range U.S. Forest Service programs essential to meet future resource needs. The National Forest Management Act (NFMA) of 1976 under 16USC§472a sets forth the requirements for land and resource management plans for the national forest system. It also amends several of the basic acts applicable to timber management and specifically addresses most aspects of timber management and how it is related to other resources. It is the primary authority governing the management and use of timber resources on national forest system lands. The Forest Resources Conservation and Shortage Relief Act of 1990, as amended in 1997 under 16USC§620, sets forth restrictions on export of unprocessed timber originating from federal lands. It addresses certain exceptions to export restrictions and establishes reporting requirements. The Healthy Forests Restoration Act (HFRA) of 2003 (Pub.L. 108-148) provides processes for implementing hazardous fuel reduction projects on certain types of "at-risk" national forest system and U.S. Bureau of Land Management lands. It also provides other authorities with direction to help reduce hazardous fuel and to restore healthy forest and rangeland conditions on lands of all ownerships.

D. In 1964 Congress passed the National Forest Roads and Trails Systems Act, which put the USFS in the business of building and funding logging roads for timber companies to reduce their logging costs, so far 436,000 miles of permanent and temporary national forest roads have been built. It was not long before a roads-for-timber-for-roads mentality began to take root, producing ever-greater amounts of both. Between 1950 and 1969 the amount of timber cut from national forests jumped from 5.6 billion to 12.8 billion board feet. The roadbuilding budget soared, and the employment of civil engineers soared to 3,500. Today more than 350,000 miles of roads run through the national forests, making it the most extensive road system in the world. New road construction rates on the National Forest Road System have ranged from nineteen miles in FY 2002 to 101 miles in FY 2004 while an annual average of 468 miles of Forest System Classified Roads have been decommissioned during that time.

1. In the Monongahela National Forest in West Virginia in 1964 the Forest Service switched from an all-age management program of the hardwood forest to an even-aged management program, which required extensive clear-cutting in a forest largely supported by recreational users. Local residents and the state legislature protested because clearcutting would undermine the region's considerable tourism business, which depended almost entirely on good hunting and fishing and the rolling beauty found in the national forest. The Forest Service held in regard to clear-cutting abuses that no clear-cutting should be undertaken unless it could be proved that the area in question could be restored to full growth within five years. Congress responded in 1976 with the National Forest Management Act (NFMA) that limited clear-cutting with the Church guidelines. The sale of timber from each forest had to be limited to a quantity equal to or less than that which the forest could replace on a sustained-yield basis, provided all multiple-use objective were met. The Forest Service also was instructed to maintain species diversity and not just maximize the growth of trees that were commercially sought, according to a 50 year plan.

2. The selling of some timber at prices below the cost of administration had been a traditional part of Forest Service policy for years. But by the 1980s, as much as one-fourth of all the nation's timber was being taken off national forestland. In some more rugged areas, such as Alaska's Tongass National Forest it could cost as much as \$250,000 a mile for a logging road. The Forest Service however builds these roads to encourage bidding on timber. In June 1984 the General Accounting Office (GAO) publish a study on the extent of below-cost sales in more than three thousand timber sales. In 1981, 27 percent of the sales did not cover Forest Service costs to administer them, and in 1982 below-costs soared to 42 percent of the sales, accounting for a loss of more than \$156 million in those two years. Over 88 percent of the sales were below cost in 1981 and over 96 percent were below cost in 1982. On

the basis of sale economics some national forest lands should not be managed for timber production. The Wilderness Society concluded that “over the last decade, if below-cost timber sales had been eliminated in both good and bad years the federal treasury would have netted at least \$2 billion more. The Forest Industry Council estimated in 1980 that domestic timber demand could be indefinitely supplied by private forests alone, using intensive timber management practices, if landowners could realize a 10 percent annual return on investment.

3. Although the USFS allowed 248,000 acres of forest land to be logged in 2003 they only "reforested" 164,000, of which slightly more than half was performed by allowing "natural regeneration"; two acres out of three. 152,000 acres of land were reforested in FY 2004, yet nearly 900,000 surveyed acres were still in need of reforestation. Since 1991 the service's annual acreage of reforested land has declined by seventy percent (from 505,000 acres in 1991) and has also fallen as a proportion of the surveyed acreage found to be in need of reforestation. The Knutson-Vandenberg (KV) Act of 1930 gives the USFS the right to require deposits from timber companies to ensure proper reforestation. The Forest and Rangeland Renewable Resources Planning Act of 1974 and Federal Land Policy and Management Act of 1976 stressed the use of Forest Plans for managing each national forest that must include a reforestation plan so that cutover lands can be restocked with assurance within five years of the final harvest and prohibiting logging where soil, slope or other watershed conditions will be irreversibly damaged and requires each sale to include a sale area improvement plan outlining mitigation measures required to counter logging impacts. Forest planning is to be comprehensive and integrated for multiple uses, not exclusively for harvesting timber. Fewer than 4,800 out of 383,000 miles of permanent USFS roads are open to all passenger cars without restriction, and no more than 80,000 miles of permanent roads can be used by passenger cars under specified conditions, such as negotiating slowly on single land roads. Nearly 300,000 miles of the classified USFS road system exclude passenger cars and all but high-clearance vehicles. By contrast, logging trucks and other high-clearance vehicles can travel 220,000 miles of permanent USFS roads. Many believe that all federal subsidies for construction of logging roads by private companies should be stopped.

E. 2. In summer of 2017 it was discovered that the Forest Service (FS) burns public land sixty times more than National Parks Service (NPS). In 2017 1.2% of National Forest acres burned and 0.02% of National Park acres burned. The USDA Forest Service is fined up to \$800 million for the 2017 fire season, all 33,000 employees fired, FS land, property and entire \$5.3 billion FY 18 budget is due process by the national and county parks for forfeiture for arson within the special maritime and territorial jurisdiction under 18USC§81. The Forest Service budget cut from \$5.7 FY 17 and \$5.3 billion FY 18 Forest Service budget is accelerated with a \$400 million fine FY 17 and \$400 million fine FY 18 to fire the arsons who because of pyromaniac disease or injury, are unable to render useful and efficient service in the employee's position are not qualified for reassignment, and therefore due disability retirement under 5USC§8337(a). These fines should be paid to county parks to be shared, as needed, with fire districts responsible for dismantling, chipping and chucking the slash piles left littering arsoned national and other forests. Ask not what your country can do for you, ask how much wood, could a wood chuck, chuck and chip, if a wood chuck, could chuck and chip wood under 24USC§422, 24USC§423(b) and 54USC§302904?

1. The FS states of Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon and Washington, need to be fired on the rational basis of arson within the special maritime and territorial jurisdiction under 18USC§81. Due process must be given to distributing the entire \$5.3 billion FY 18 Forest Service budget for the National Forests, to county park supervision, and fire districts as needed, to be

received as a donation of land and money from the FS to the Federal National Park Foundation as a transitional matter of inter-jurisdictional immunity under 54USC§100101 *et seq.* In states that were not badly burned FS forest laborers and management might have a right of re-employment. For the most part FS pyromania has unlawfully intruded and violated the rules and regulations for so long under Fire 36CFR§261.5 and 24USC§154 the Forest Service must be abolished without presumed right of re-employment under 24USC§225 *et seq.* Forest labor in general and pyromaniacs in particular are harmful to them-self and others, and extremely destructive to the environment under *Washington v. Harper* (1990). Pyromania is thought to be a dangerous mental illness in prison related with many serious crimes. Due to disease or injury, all Forest Service employees are believed to be unable to render useful and efficient service, and are not qualified for reassignment, and therefore entitled to disability retirement under 5USC§8337 and Eligibility for Disability Sec. 223 of the Social Security Act under 42USC§423 self-acquitted for arson under 36CFR§261.50.

2. The United States Forest Service is convicted of arson within the special maritime and territorial jurisdiction under 18USC§81. The Forest Service burnt their National Forests intentionally by conventional means of kerosene, most of the burned acreage was however caused by iron dust instead of silver iodide cloud seeding missiles to cause lightning, the most frequent cause of large forest fires that get quite large because they are randomly ignited in multiple areas and inaccessible to fire fighters. Forest Service contractors were also noted to have afflicted the deer population with fleas, the tic population with Lyme disease, and Tonto National Forest with rabies, put leeches in several popular lakes. A century after the Big Blowup fire in 1910 and the introduction of gold bugs, to attack the allegedly non-native medicinal St. John's wort in 1916 that stills grows unharvested in commercial quantities in the Rogue River Siskiyou National Forest, with two claims to largest wildfire in the nation in 2017 under Fire 36CFR§261.5.

2. County parks are called upon to remove litter, chip and chuck wood piles left by Forest Service contractors collectively, and by protecting volunteer litter removers and wood chucks under 24USC§422, There cannot be any litter, commercial logging contracts, terrorist slash piles, nails in trees, land or air lightning strike attempts, or depraved trail ribbons, for the national forest lands, or urban-forest interface, to be equally protected against arson and other related terrorism, as national parkland. Because uncontained wildfires occur 60 times more in 1.2% of National Forests than 0.02% in National Parks, or 0.07% average for all National Resource Lands in the 2017 fire season. Wildfires and slash piles are coming closer to buildings and cities, than ever before. The Department of Interior, Bureau of Land Management, National Park Service, County Parks, State Parks have jurisdiction and volunteer wood chucks, on the rational basis of arson and other forestry department related terrorism, to seize all slash piles, land, property, buildings and FY 2018 budgets of Forest Service local and national offices. The national forests and grasslands require the professional park supervision and jurisdictional competence invested in them by Pub. L. 113–287, §6(e), Dec. 19, 2014, 128 Stat. 3272, codified, end of the law - Title 54, National Park Service and Related Programs.

## **§16 National Trail System**

A. The Indians put their feet where the animals had gone, and established a network of trails that laced through the woodlands and mountains of the East for the purposes of hunting and trading. When the Europeans came, they put the same network to their own purposes, which included not only hunting and trading, but settlement, the footpaths gradually widening into horse trails, then wagon roads, interconnecting with the rivers to forma transportation system that serviced the needs of the loose

coalition of colonies between the Atlantic Coast and the banks of the Mississippi. Into the West, some trails blazed instead of followed. Lewis and Clark heading over the High Plains to the Rocky Mountains from their camp on the upper Missouri in 1804. Two decades later, the first trading caravans began rumbling southwest from St. Louis to the settlements in a foreign land called New Mexico, along the Santa Fe Trail, and from there north along the Taos Trail. In the 1830s and 1840s, the promise of rich land and richer opportunity in the Pacific Northwest and California called the wagons west from “jumping-off” points on the Mississippi and Missouri rivers, up the valley of the Platte River to Fort Laramie through South Pass to Fort Bridger, then north up the valley of the Snake River, if you were bound for the Oregon Country, or west by southwest across the Great Basin and the Sierra Nevada if you were bound for California. It was called the Oregon Trail or the California Trail, and tens of thousands wore a tracery of ruts into both over the course of nearly thirty years. The Mormons too blazed the Mormon Trail to the Great Salt Lake and then to San Bernardino in Southern California. In 1876 the Appalachian Mountain Club (AMC) was formed by a professor at the Massachusetts Institute of Technology (MIT). The AMC is now the oldest mountain club and largest with 35,000 members in the USA). In 1910 the Green Mountain club set its members to work cutting a 265 mile footpath in the wilderness between the Canadian border and the Massachusetts state line called the Long Trail.

1. On October 2, 1968, President Lyndon B. Johnson signed into law two bills, one creating the National Wild and Scenic Rivers System, the other the National Trails System. The Wild and Scenic Rivers System was intended to preserve to varying degrees free-flowing waterways. It began with eight river segments totaling 789 miles. 20 years later there are only sixty-six designated rivers and river segments or about one-fifth of one percent of America’s total for a sum of 7,225 miles of water. These river segments are to be kept forever free of development – they are not to be canalized, dredged, filled, or dammed along their designated lengths. The National Trail System was begun with the immediate designation of the Appalachian Trail, running 2,000 miles through 12 states, from Springer Mountain in Georgia to Mount Katahdin in Maine, and the Pacific Crest Trail, running 2,350 miles from the Mexican border to the Canadian border through the states of California, Oregon and Washington, as the first scenic trail. The act also named an additional fourteen trails as worthy of study. As of 198 more than 23,650 miles of scenic and historic trails have been designated. Another 752 recreation trails comprise more than 8,000 miles. Of the 752 National Recreation Trails, 499 are under federal management, 12 are jointly administered by federal, state, and local governments, 78 are administered by the states, 138 are administered by local governments, and 26 are managed by private organizations.



2. The number of miles of trails peaked in the 1940s at 144,000 miles. Between 1932 and 1950, 20 million acres were added, but the number of trail miles decreased by 3,000 miles. The network of scenic, historic, and recreation trails created by the National Trails System Act of 1968 connects the north and south by means of the >1,000 mile Pacific Crest Trail, Continental Divide Trail and Appalachian Trail, however the >2,500 mile east-to-west trails have become tarred over, disconnected and historic. From 1964-1974 23,000 miles of trails were lost. By 1974 the trail system mileage was only two-thirds what it had been forty years earlier, and by 1980 only 101,000 mile remained. Written instruments such as cooperative agreements, assistance agreements, are volunteer agreements, and memoranda of understanding should be used to formalize National Trail partnerships at the relevant agency level consistent with the National Trail System Act of 1968 under 16USC§1246(h)(1) - Trump Trail coast to coast.

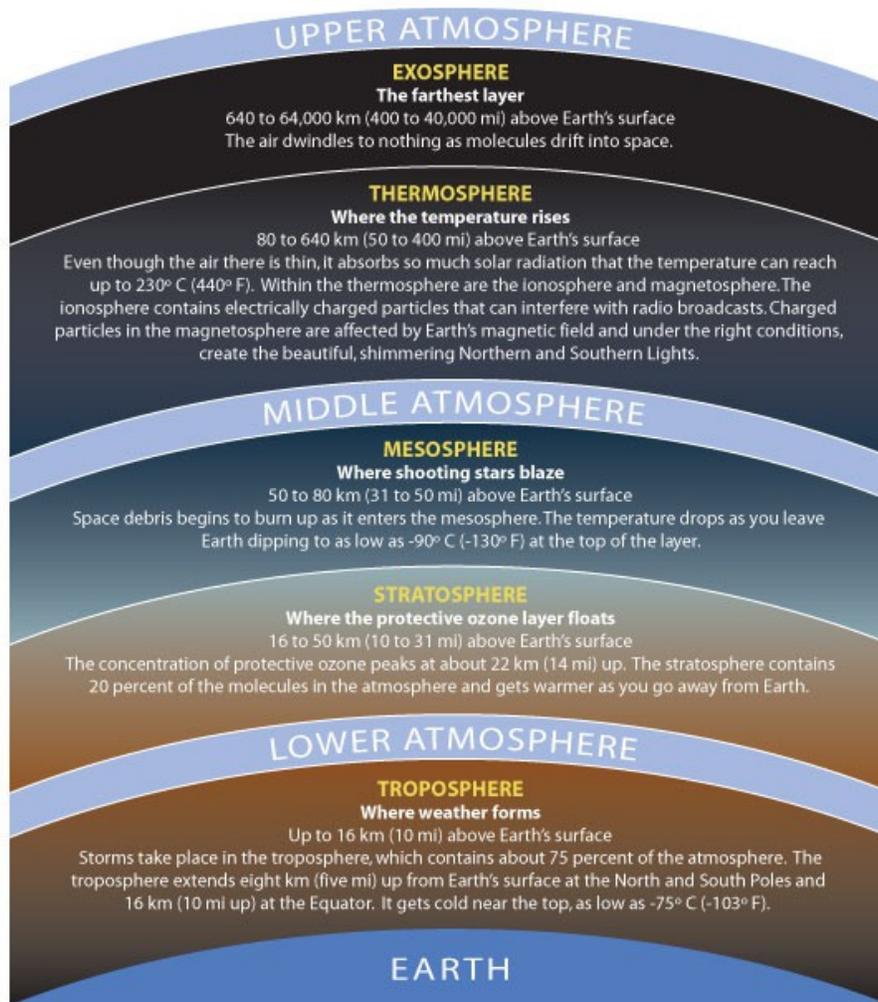
### Art. 3 Meteorology

#### §17 Atmosphere

A. The gases that comprise the "dry" atmosphere occur in fixed proportions up to about 62 mi (100 km) above sea level. This well-mixed layer is known as the turbosphere, and within it the mixing is carried out by large-scale weather systems and much smaller-scale turbulence. This region is capped by the turbopause, above which lies the thermosphere. Here the atmosphere is characterized by layers composed of individual gases separated out according to their molecular weight. The heavier gases occur at the lower levels of the upper atmosphere. "Dry" air refers to the gaseous constituents of the Earth's atmosphere - with the exception of water vapor. This is not included because, unlike the gases that occur in fixed amounts, water vapor is highly variable in concentration. Water vapor resides at lower levels, mainly within the first few miles of the atmosphere, because it originates at the Earth's

surface. In addition to its gaseous constituents, the air within the lower levels of the atmosphere (the troposphere) contains solid and liquid water in the form of ice, water droplets, clouds and precipitation. Very small particles, known as aerosol, also occur in the same layer; they comprise a suspension of solid and liquid particles with very low settling velocities and small diameters.

## Layers of the Atmosphere



Credit: Bing

1. The troposphere is the lowest layer of the atmosphere. This layer is characterized by temperatures that, on average, decreases with height, and by the presence of almost all the atmosphere's clouds and weather. Something like 80% of the mass of the atmosphere is contained in the troposphere, along with virtually all the clouds, water vapor and precipitation. The layer is generally well mixed by vertical circulations of the air. Ascent of an air particle from low level to the vicinity of the tropopause can occur in a few minutes in the most vigorous thundercloud updrafts, while in clear conditions the journey may take several days. This type of air motion is a hallmark of the troposphere, although it does not occur everywhere all of the time. Because the depth of the overturning motions is related to

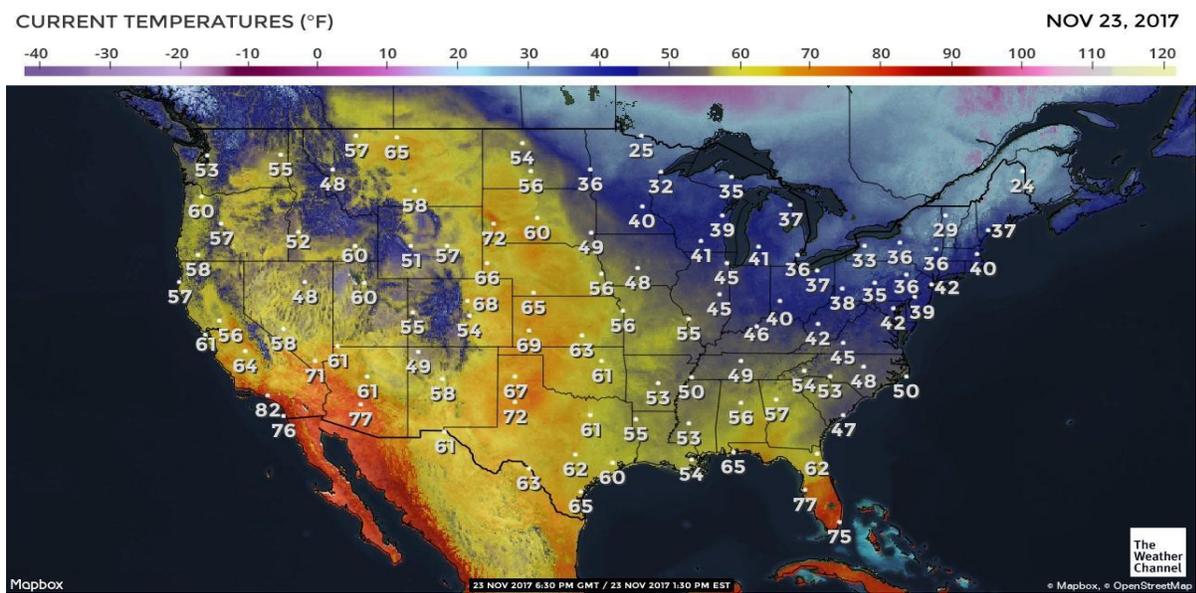
the intensity of surface heating, on average the layer is deepest in the tropics and becomes shallower toward the poles. There is a seasonal variation outside the lowest latitudes such that the troposphere is deepest in summertime. When air ascends it cools at a rate that depends on whether it is "dry" (i.e., without clouds) or "saturated" (cloudy). Conversely, air that descends will warm at the same rate as ascending air, depending on whether the sinking happens within clear skies or within a cloud. Ascending air moves into steadily reducing pressure, which causes it first to expand and then consequently cool. Descending air is compressed as it subsides gradually into higher pressure and thus is warmed. So the up-and-down motions that typify the troposphere are associated with cooler air aloft and warmer air below. The average lapse rate of temperature - the rate at which it falls with height - is almost 3°F/1,000 ft (6°C/km). Air at 0 ft that is 59°F (15°C), is 57°F (14°C) at 300 ft (100 m), 55°F (13°C) at 700 ft (200 m), 54°F (12°C) at 1,000 ft (300 m) and 52°F (11°C) at 1,300 ft (400 m). If the bubble is cloudless, it will cool at a fixed rate, known as the dry adiabatic lapse rate (DALR) which is 5.5°F/1,000 ft (9.8°C/km). Conversely, when air sinks toward the surface, it will be compressed and warmed at this rate. If ascending air is damp enough to produce cloud droplets, latent heat will be released, which warms the air and offsets the DALR. This reduced rate of cooling is called the saturated adiabatic lapse rate (SALR), and it varies according to the quantity of water vapor contained in the air. It is the rate of temperature decrease that would be measured within a cloud.

2. The stratosphere was discovered independently by two European scientists in 1902 who established that above about 5 mi (10 km) the air temperature either remains constant with height or actually increases. This layer extends from the tropopause up to 31 mi (50 km) above sea level, where its maximum temperature is reached. As an annual average above middle latitudes, this is about 32°F (0°C). This layer is stratified, or layered, since it is a region within which temperature is constant or increases with height. It is colder below and warmer above, and this suggests that the overturning motions in the stratosphere are reduced in contrast to those in the troposphere. Sometimes cumulonimbus clouds formed within the troposphere, in the tropics or over the interior of the USA in summer, for example, can overshoot into the lower reaches of the stratosphere. It is so stable and so dry in this region, however, that the upward-shooting cloud is soon evaporated by mixing with the ambient air. Increased temperature in the middle and upper stratosphere is caused by the absorption of the short-wave solar radiation by ozone, a form of oxygen molecule that has three atoms rather than the much more common two-atom form of the gas. The existence of ozone at these levels is due to the splitting, or dissociation, of oxygen molecules into two oxygen atoms by the action of that same short-wave radiation. This means that ozone is constantly being created and destroyed by natural processes in the stratosphere, mainly at a height of 12-19 mi (20-30 km). The complex chemical reactions that occur within the ozone layer mean that some 90% of the potentially harmful ultraviolet radiation that streams into the atmosphere in the solar beam is absorbed. Today, the artificial destruction of the ozone is of enormous concern internationally since such depletion will lead to increased risk of harmful ultraviolet radiation reaching the Earth's surface. The Ozone Secretariat was established to enforce the Vienna Convention for the Protection of the Ozone Layer of 1985 and for the Montreal Protocol on Substances that Deplete the Ozone Layer of 1987. These treaties are landmark international agreements designed to protect the stratospheric ozone layer by stipulating that the production and consumption of compounds that deplete ozone in the stratosphere--chlorofluorocarbons (CFCs), halons, carbon tetrachloride, and methyl chloroform--are to be phased out by 2000 (2005 for methyl chloroform). By 2020 corticosteroids inhalers must be exempted from the Montreal Protocol ozone export ban. In the polar stratosphere there is a marked seasonal change in the air temperature, which is caused mainly by the prolonged months of darkness during the polar night and the similarly extended period of light during the polar day.

3. The mesosphere or middle, region lies above the stratosphere and impinges on the lower ionosphere. It is characterized by temperature that decreases with increasing height, from something like 32°F(0°C) at its base to around -130°F(-90°C) at the mesopause, where the atmospheric pressure is about 1/100,000 of the sea-level value. The thermosphere is a deep layer that stretches from the mesopause to the outer limit of the Earth's atmosphere; it lies above the well mixed turbosphere (also known as the homosphere) and is sometimes termed the heterosphere. The thermosphere is characterized by increasing temperature with elevation, such that at heights between 190 and 310 mi (300-500km), it reaches between 930°F(500°C) and 3,600°F(2,000°C). This temperature range is directly attributable to solar activity, the highest values associated with an active Sun. It is within the thermosphere that the gases separate out according to their molecular weights. The exosphere is the farthest layer at heights from 400 to 40,000 mi (640, 64,000 km). The air dwindles to a few molecules floating in outer space but temperatures remain at thermosphere highs.

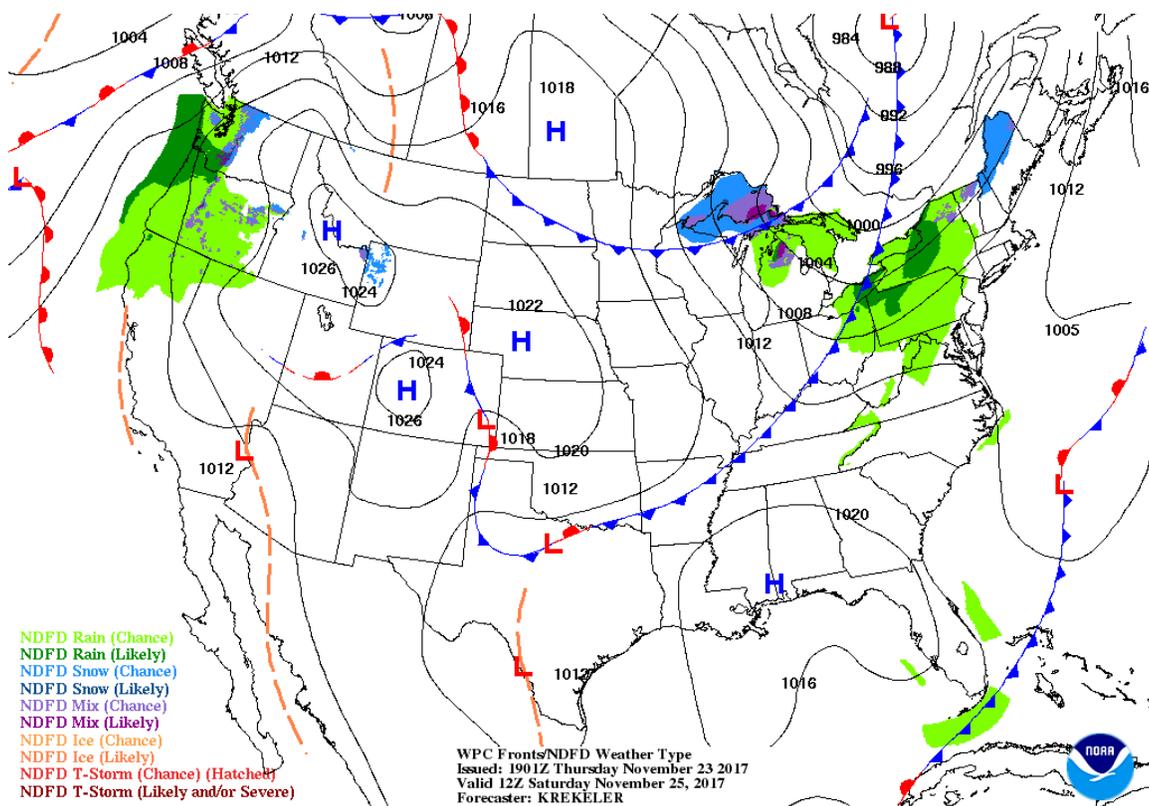
### §18 Observation

A. The measurements that are taken routinely at weather stations across the globe are a standard set of observations laid down by international agreement through the agency of the United Nations' World Meteorological Organization (WMO) in Geneva, Switzerland. Surface weather is observed operationally on an hourly basis at busy airports and military airfields. At many other sites, however, observations are only taken every three, six or perhaps 12 hours. In these cases, it is important that they include the hours of 0000 and 1200 UTC because these are the key times on which forecasts are based. Normally, the surface observations reported every hour are dry bulb temperature, dewpoint temperature, mean-sea level barometric pressure, pressure tendency, total cloud amount cloud type and base height, horizontal visibility, wind direction and speed, present and past weather, and precipitation total (usually 12 or 24 hour). Surface observations are then supplemented by information collected by other means, Over the last 50 years or so, global upper-air observations have developed into an essential component of the network, providing all-important information on how temperature, humidity, wind direction and speed vary up to about 12 mi (20 km) above sea level. These variables are measured by balloon borne instrument packages called radiosondes, which are released routinely four times a day- usually at 0000, 0600, 1200 and 1800 UTC.



1. Since 1960, weather satellites have orbited the Earth, not only providing operational information in regards to clouds and other information, information including profiling of temperature and humidity levels throughout the atmosphere. Radar has also evolved since World War II into a useful tool for weather analysis because it can be "tuned" to sense precipitation within about 60 mi (100 km) of the antenna. Today, for example, Canada is covered by a network of such radars, from which a national map of the extent and intensity of precipitation is produced every 15 minutes. Many their weather services have similar systems. Precipitation radars across Australia have dual purpose in some areas, where, generally, population is sparse. In such places, they are used for tracking balloons to produce estimates of wind speed and direction up through the atmosphere. The area covered by each radar is basically the same as those in Canada. The national network of Doppler radars in the USA offers a complete cover by these more sophisticated instruments. They provide maps of precipitation and low level wind fields that indicate the location of convergence lines along which the air streams together as a possible harbinger of thunderstorms.

### 48 Hour Weather Forecast Thanksgiving November 23, 2017



2. NOAA satellites are part of a network that forms a crucial component of the global weather observing system. Currently there are two satellites in near-circular polar orbits, roughly at right angles to each other, at a height of 530 mi (850 km). The height of a satellite determines its period - the time it takes to circle the Earth once. For a NOAA satellite, this is 102.1 minutes. Today's NOAAs weigh just over 1.7 tons and require power of 475 Watts from their solar paddles when all systems are working. There are other weather polar orbiters, including the Russian Meteor series at a higher

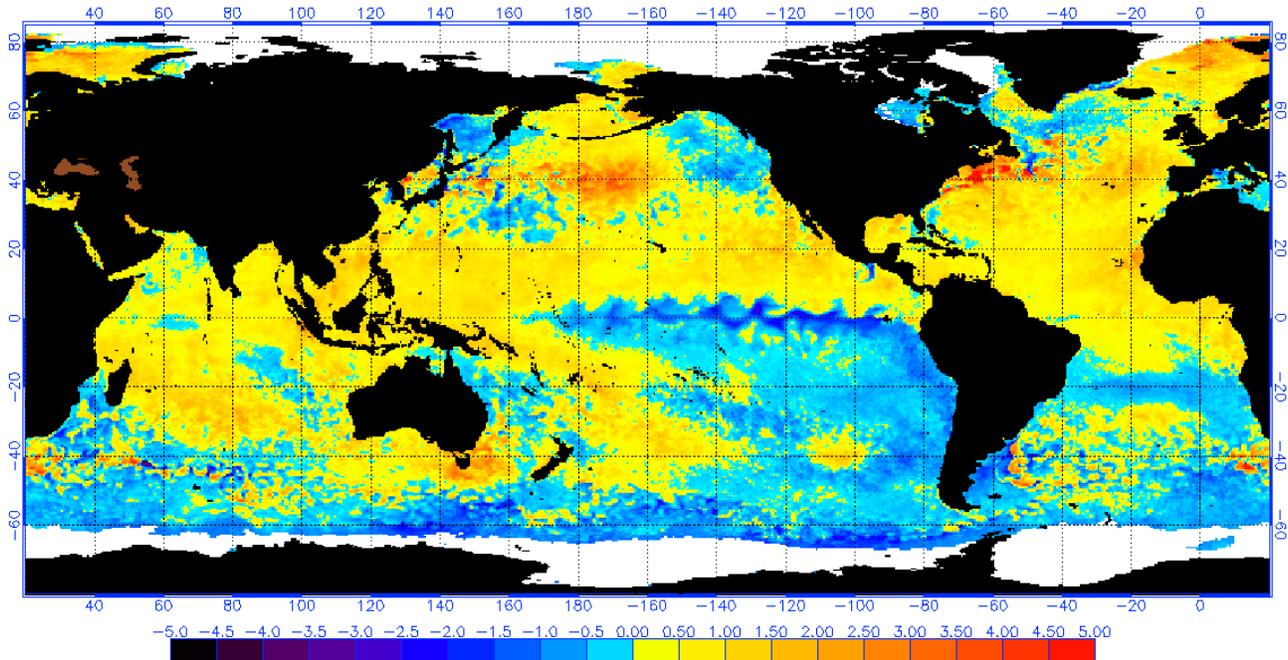
elevation of around 740 mi (1,190 km) and a period of 109.4 minutes. Polar orbiters look down at the planet from a relatively low altitude, around 620 mi (1,000 km), which is only about 0.08 of the Earth's diameter. They provide meteorologists with high-quality images along a swathe of the Earth's surface that shifts from one orbit to the next as the planet rotates beneath the satellite. If a satellite is launched to 22,400 mi (36,000 km) above the equator, its complete orbit takes 24 hours. At 2.8 Earth diameters from the Earth's surface, such a satellite is a long way out in space. This is called the geosynchronous (or geostationary) orbit, because the period of a satellite is the same as the time the Earth takes to rotate once about its axis. Thus, the satellite keeps pace with the spinning planet, racing along eastward at a speed of just over 2 mi/sec (3 km/sec) and appearing to hover over the equator. This type of orbit ensures that the satellite always sees the same "full-disk" face of the Earth, producing a new image of either all or part of the region every 30 minutes. There are five weather satellites distributed fairly evenly around the equator, operated by different agencies. Meteosat's are run by the European weather satellite organization, known as EUMETSAT; the two US GOES (Geo-stationary Operation Environmental Satellite) orbiters are overseen by NOAA and GMS (Geostationary Meteorological Satellite) is operated by the Japanese Meteorological Agency. The Current Operational Sea Surface Temperature (SST) Anomaly map needs to be fully integrated into meteorology reports to explain high pressure and droughts caused by oceanic hydrocarbon heating pumps and low pressure by oceanic refrigeration.

## **§19 Air Pressure**

A. Warm dry winds in in the United States in the fall of 2017 are the combined result of a new pattern of artificial oceanic warming of the North Atlantic and Asian half of the Pacific, resembling La Nina, but with warming at 40° N instead of cooling of the central and eastern Pacific tropics, to mirror the heating belt at 40° S. Thermal effluence from the Potomac to Nova Scotia was turned off during the 2017 hurricane season. Although there have been some successes chilling the Hudson Bay and erecting a hurricane defense with oceanic refrigeration that remains to protect coral in Florida and the Bahamas against the artificial oceanic warming to the northeast of Washington DC. There are two artificial warming belts circumnavigating the oceans at 40°N and 40°S latitudes. Constant oceanic hydrocarbon heating pumps are believed to be the leading cause of drought, high pressure and global warming. Although more significant contributors to triple digit heat when and where they occur, seasonal forest fires are thught to be the second leading cause of drought, high pressure and global warming. Combined both hydrocarbon heating pumps and forest fires must be studied to protect against arson within the maritime and territorial jurisdiction under 18USC§81.

NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 11/23/2017

(white regions indicate sea-ice)



1. The difference between high and low pressure across the Earth's surface is the basic driving force that makes the air move. Take as an example the difference in pressure between the centers of the Iceland Low and Azores High during the North Atlantic winter, assessed using the extreme-season maps. This turns out to be about 25 mbar. By determining the distance between the two, which is something like 1,500 mi (2,500 km) one calculates the horizontal gradient of pressure - or how fast pressure changes across the sea surface. In this case, it would be around 1 mbar per 60 mi (100 km). This is a fairly steep gradient and means that the sea-surface wind speed midway between the Azores and Iceland is, on average during the winter, about 16 m/sec or some 56-58 km/hr (35 or 36 mi/hr). A large pressure difference between a high and a low that are close will produce a steep gradient and a strong force to drive the air. A large pressure difference between a high and a low that are close will produce a steep gradient, however, will generate less force. The steeper the gradient, the stronger the wind. The difference between the "head" of air above a high and that above a low drives the air from the high toward the low. This flow will decrease the mass of air in the column above the high, causing pressure to fall, and will increase the mass of air in the region of the low, causing pressure to rise. Although air flows from high-pressure regions toward low-pressure areas, the direction of the flow, or wind, is not straight from one to the other. The Earth's rotation causes the wind to be deflected so that it spirals out of the highs and into the lows. The direction of the mean prevailing winds across the Earth's surface in January and July is strongly related to the direction of the isobars. Isobars are graphic representations of this wind on weather maps.



2. Regional winds are too numerous to mention. All are related to the critical location of low and high pressure systems that act to channel the airflow in a particular direction. Local topography can also accentuate its strength by "squeezing" wind between two areas of high ground. In some parts of the world, such as areas of the Mediterranean basin, well-known winds blow over quite restricted areas. They occur when the pressure patterns display a particular distribution - like the northerly Mistral that shoots down the Rhone valley in southern France between a slow or stationary low pressure system over, say, central Europe and a high located across Biscay. There are many regional winds around the Mediterranean, including the hot, dry southerly Sirocco whose baking heat comes from its source over the Sahara. In contrast, the wintertime northeasterly Bora is associated with the cold, gusty conditions found across the Adriatic shores of the Dinaric Alps. There is also the Santa

Ana wind of southern California. This hot, dry, northeasterly blows parchingly over the Los Angeles basin and is frequently linked to the wildfires that are a notorious risk for properties on the upwind flanks of that city. In addition to the risk of fires, they are hazardous for drivers and pilots. Desert winds rise in a clock-wise pattern from a high pressure East of the Sierras. Air extends from the mountains and is compressed and warmed, becoming less humid. Winds gust through the canyons at 40 to 60 mph.

3. Along many of the world's spring and summertime coastlines, cool, "fresh" air, often blows onshore as the sea breeze. Whether or not this occurs depends on the larger-scale weather pattern providing relatively light winds and mainly clear skies over a coastal region. If this is the case, the land surface will heat up quicker than the adjacent sea after sunrise, because water has a more sluggish thermal response to the sun shining on it. Throughout the early morning hours the preferential heating of the land leads to a fall in the barometric pressure there. The pressure over the sea does not fall, however, but it remains relatively high and drives the sea air across the coast toward the low inland. The greatest contrast between the air temperature above the land and sea occurs during the afternoon, with the warmest conditions over land. This means that the strength of the breeze is usually greatest during the afternoon and will decline gradually as the sun goes down. The all-important thermal difference across the coast means that in the tropics sea breezes can generate all year round, while in higher latitudes they are generally only warm season phenomenon.

4. Sea breezes have distinct leading edges that move inland more or less parallel to the coastline, quickest across low-lying areas. The "front" has a lobelike structure whose passage leads frequently to an abrupt fall of temperature (as the sea air is cooler) and increase in humidity (because the sea air is damper). The wind direction can change rapidly too. Often the denser sea air, which may be up to 980 ft (300 m) to 1,300 ft (400 m) deep, scoops up the warmer land air ahead of it to produce a line of cumulus clouds that are organized parallel to the coast. Such clouds can produce showers along this sea breeze "front". After dark, as the land surface cools more rapidly than the sea, the pressure difference switches to drive a gentle land breeze toward the sea through the night. It tends to be light than the daytime sea breeze because the temperature contrast is weaker at night. Under the same large-scale weather conditions as those that permit the genesis of sea and land breezes, broadly similar

circulations can occur across the shores of sizable lakes. The US Great Lakes, for example, experience daytime lake breezes during some spring and summer days, as air blows onto the surrounding land across their shores. This can occur over many large lakes or inland seas, such as the Caspian and Black Seas.

5. Pressure is related to the weight of the air above the point at which the measurement is taken. The air is compressed under its own weight, so its density also decreases with height. The annual global mean-sea-level pressure is 1013.2 mbar, which relates to an air density of  $1.23 \text{ kg/m}^3$ . At the top of the Empire State Building in New York, USA, it is typically 53 mbar lower than at sea level; air at the harborside in New York is about 3% denser than the air at the top of the Empire State Building. Going up through the highest peaks leads to thinner and thinner air, down to a density of  $0.48 \text{ kg/m}^3$  at the top of Mount Everest, where the average pressure is 315 mbar. Commercial jets normally use cabin pressures between about 850 and 800 mbar, which is about the same as being in the open air between 4,900 and 6,600 ft (1,500 and 2,000m) above sea level. Such jets cruise at a level where the outside pressure is around 250 to 200 mbar because that is where they are most fuel-efficient.

6. High pressure areas tend to be associated with dry, settled conditions, whereas low pressure regions relate to the frequent occurrence of cloudy, wet and windy weather. The Iceland Low and Aleutian Low, which occur in the higher latitudes of both the North Atlantic and Pacific Oceans respectively are examples of the traveling low-pressure system that run typically from southwest to northeast across these oceans during the winter months. The minimum pressure values mark the point where, on average, the depressions, or cyclones, reach their deepest (lowest). The southwest/northeast alignment of their troughs indicates the mean track of the depressions in the winter. The long term average value across the centers of the Iceland and Aleutian Lows is around 995-1,000 mbar, a few thousand kilometers across. The trough that stretches northeastward from the Iceland Low is more extensive than that linked to the Aleutian Low. This is largely an expression of how the traveling cyclones are able to penetrate deeply into the Arctic Basin via the broad Norwegian Sea, in contrast to the more limited poleward excursions across the Bering Strait. In contrast to the maritime lows in the winter hemisphere, the extensive cold continents are marked mainly by the presence of very large highs, or anticyclones. The centers of these two major features lie deep in the middle-latitude continental interiors of Asia and North America. The most intense is the Asian High, with a long-term value above 1,040 mbar; the center over the United States is less intense than the Asian High (about 1,020-1,025 mbar) but nevertheless, it still has a strong influence on the regional weather. The highs are the products of intense radiative cooling that occurs across these vast land masses in the winter. As with lows, there is no specific value of pressure that defines such a feature as "high" the pressure quoted is simply the maximum value that occurs across an extensive region. Therefore, a high could have a value of, perhaps, 1,055 mbar on a particular day, and 1,015 mbar on another. In addition to the cold continental winter anticyclones, regions of high pressure occur across the subtropical North Atlantic and Pacific Oceans. These are the Azores and Hawaiian Highs, which dominate the weather in these regions. They are warmer than their continental counterparts, and deeper, stretching throughout the depth of the troposphere. Cold anticyclones are shallow, recognizable as highs only up to 1 mi (1.5-2 km) above the surface.

7. On the poleward sides of the anticyclones, major warm and moist currents of air move toward the poles as south westerlies and northwesterlies in the North and South Atlantic respectively. Across the British Isles and western Europe, the southwesterly wind direction predominates. This maritime stream of air contrasts strongly with that on the other side of the North Atlantic, which affects Labrador, the

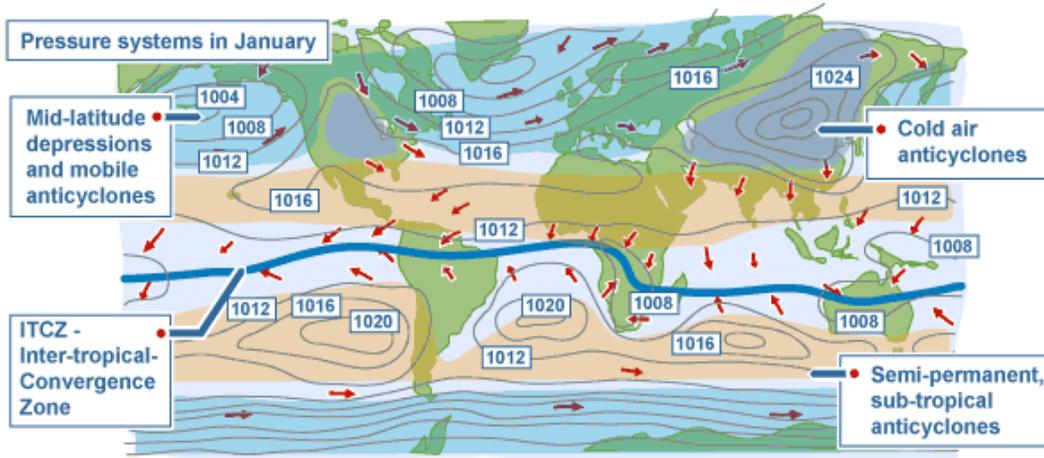
Maritime Provinces and the northeastern USA. Here, the prevailing wind direction is northwesterly, between the Iceland Low and the high over the USA. This means that most often the air comes from the cold, dry regions of North America's higher latitudes. In a similar fashion, mild and moist southwesterlies flow toward southern Alaska and western Canada. The situation here differs from that in the northeastern Atlantic because of the Rocky Mountains, which are aligned more or less at right angles to the tracks of the traveling lows. Much of the precipitation from the northeastern Pacific depressions is deposited on the Rockies, to the detriment of the arid high plains to the east. In fact, the dryness of the Plains is related to the presence of the extensive rain-and-snow scavenging mountains to the west. On the contrary, Atlantic depressions can move right across the lower land of northern Europe unimpeded. On the western flank of the Aleutian Low, the predominant flow is from the northwest, from the very cold stretches of Russia and northern China. During the summer in the southern hemisphere, the westerlies blow parallel to the lines of latitude, between the subtropical highs of the South Atlantic, South Indian and South Pacific Oceans and the higher-latitude, low-pressure belt. Winds in the region of Asia are dominated by flow from the wintertime high into the Aleutian low systems. They either blow into the ITCZ as the Northeast Monsoon, or blow toward the Arctic Ocean. Although the North American High is important, it does not dominate such an extensive region.

8. Polar regions are subjected to seasonal changes of pressure. The Arctic tends to experience a weak high in the winter and a shallow low in the summer. The relatively high elevations throughout the Antarctic mean that reducing the pressure values to sea level becomes unrealistic and it experiences relatively high pressure throughout the year. The poles are also affected by geography. In the northern hemisphere, the continents widen toward the pole and surround the Arctic Ocean, while in the southern hemisphere, they taper toward the pole, giving way to the circumpolar ocean that surrounds the massive continent of Antarctica. The result of this marked difference is that frontal depressions tend to run due west-east, flanking the Antarctic continent. In contrast, those of the Northern Hemisphere extra-tropical oceans most often track from southwest to northeast in association with the thermal gradients that are aligned in the same way, parallel to the orientation of the coastlines there.

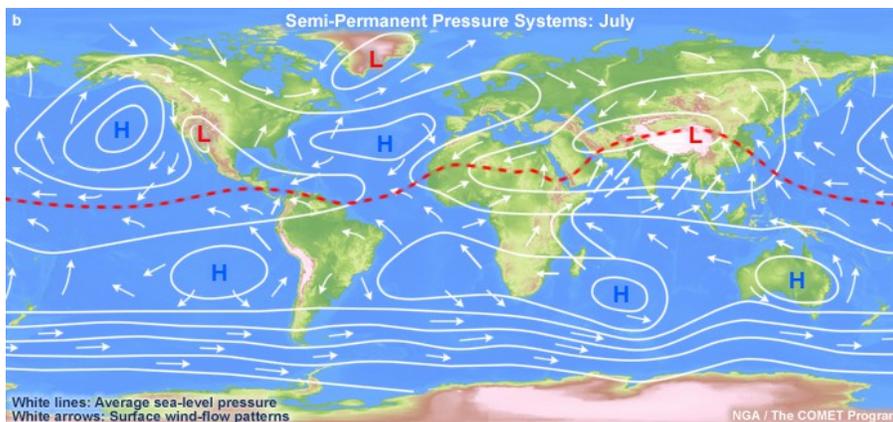
9. In middle and high latitudes, the broad continents of the northern hemisphere are intensely cold in the winter. There is an east-west difference, however with their eastern flanks colder than the western. This is true of both Eurasia and North America. The coldest conditions on the east coasts are caused by the prevailing winds, which blow off the cold continents. In contrast, the west coasts experience milder conditions in part because of the tropical maritime air borne by the traveling frontal lows that approach from the ocean. These are complemented by warm ocean currents that stream toward the western coasts. Both the Gulf Stream/North Atlantic Drift and the Kuro Siwo/North Pacific Current are crucial. The tropics experience a very small annual temperature range between the warmest and coolest months, because there is little variation in the amount of solar radiation received throughout the year. This is why the different seasons within the tropics are defined by when it rains, rather than by temperature changes. In contrast, throughout the extratropics, the winter is significantly colder than the summer, so the annual round of warming and cooling is a basic means of defining the seasons.

10. Moving toward the equator from the subtropical anticyclones reveals a broad area of low-latitude minimum of pressure known as the Equatorial Trough across the intensely heated southern continents of South America, Southern Africa and Australia. The middle-latitude southern ocean is characterized by an elongated circumpolar belt of low pressure, which is virtually unbroken, unlike the northern lows. Its presence is a reflection of depressions that travel unimpeded around the open southern ocean, providing the strong westerly winds associated with the Roaring Forties that skirt the Antarctic

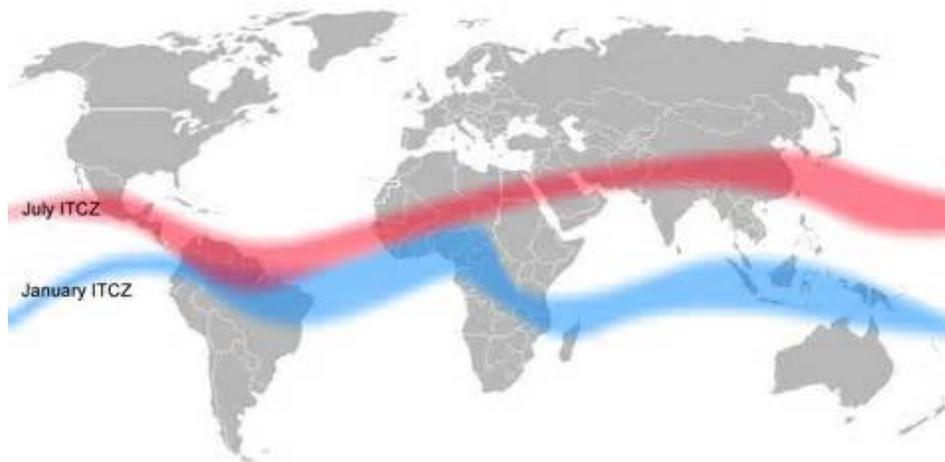
continent. In contrast, the North Atlantic and Pacific storm tracks run much more southwest/northeast, influenced by the alignment of eastern North American and eastern Asian coastlines in the middle latitudes. These depressions feed off the strong thermal contrasts that exist between the continental and oceanic regions in the northern hemisphere: the temperature gradient separating them has the same orientation. These are warm subtropical anticyclones located over the South Pacific, South Indian and South Atlantic Oceans, which give way northward to the Equatorial Trough. There are no continental highs because these regions are strongly heated in the summer and are characterized by this shallow low-pressure (1,005-1,010 mbar) feature.



11. The centers of low pressure, so marked over the northern oceans in January, are much weaker or barely discernible in July, having shifted pole-ward. The extensive continental anticyclones are now replaced by large-scale low-pressure features. Over Asia, this change is marked by a depression centered across western India and Pakistan. The switch over this continent from extensive high to extensive low pressure is linked to the evolution of the monsoon from its winter to summer phase. The summer hemisphere subtropical highs intensify or become higher. Both exhibit an increase of some 5 mbar and migrate a few degrees of latitude northward. As in winter, the east-west continental/oceanic pattern in this hemisphere is caused by the breakup of the major pressure features into very large highs and lows. The Earth-girdling Equatorial Trough, over the continents especially, exhibits a substantial seasonal migration toward the equator. The subtropical anticyclones in the wintertime southern hemisphere form a virtually complete belt, while the circumpolar lows still occur around the Antarctic with noticeable low pressure values.



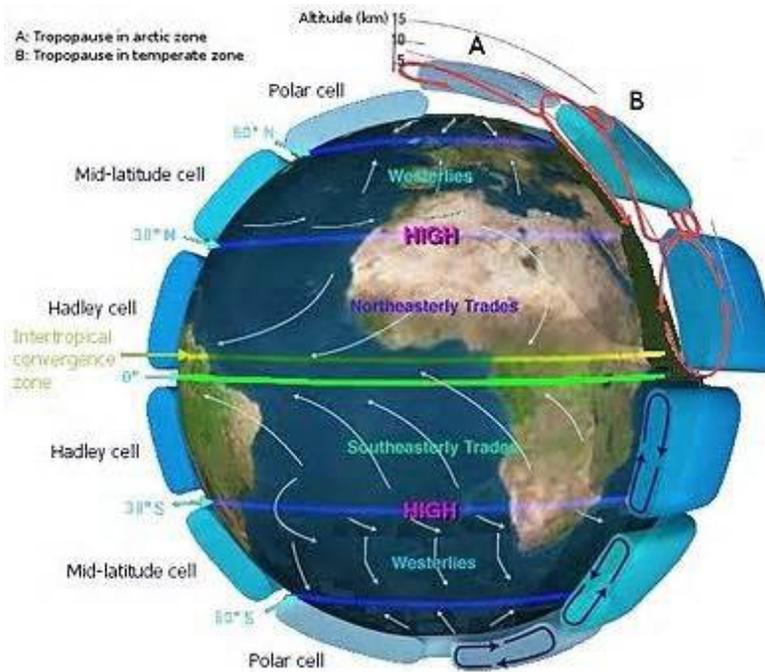
12. The relative locations of the highs and lows in January and July determine the pattern of prevailing winds and thus, in part, the nature of the weather experienced around the Earth. In January, the North and South Atlantic, and their surroundings, are influenced by the important source regions of air: the two subtropical anticyclones. At the surface, the winds flow clockwise out of these in the northern hemisphere, and anticlockwise in the southern hemisphere. Parts of these outflows run toward the equator from both highs as the Northeast and Southeast Trades. Together, these culminate in the Inter-Tropical Convergence Zone (ITCZ). The Trades are known for their strength and constancy over the tropical oceans, but they slow dramatically as they converge toward each other and enter the ITCZ. This feature, most noticeable over the oceans, is typified by the infamously light and variable winds of the Doldrums. The Trades exist throughout the year, with marked and important migrations north and south of the ITCZ, particularly over the tropical continents. The ITCZ is also well known for very strong ascent caused by the surface convergence of the hot humid Trades; this shows up as cloud clusters that produce many thunderstorms. The disastrous droughts that occur occasionally across parts of Ethiopia or Sudan can be related to the ITCZ's failure to spread far enough north, or a lack of activity in terms of the deep convective clouds that produce the life-giving downpours. On the eastern and western flanks of the subtropical anticyclones the air flows generally parallel to the adjacent coasts but also penetrates into the southern continents to supply the ITCZ.



13. The ITCZ reaches its northernmost limit during the height of the northern summer, its most "famous" excursion being across southern Asia. This seasonal change in the surface winds across India, for example, is the signature of the Monsoon, which takes its name from an Arabic word meaning "season". The convergence zone and associated low center and troughs contrast markedly with the January pattern of extensive northeasterlies across the region. Similar, but less extensive seasonal wind reversals also affect the southern part of West Africa the southwestern USA and northern Mexico. The middle-latitude westerlies occur in the northern ocean basins, but generally are less extensive and less vigorous than in the winter months. The subtropical highs on the westerlies' southern flank intensify into the summer and shift slightly poleward. They still supply the Trades, which as in January, are the most significant across the tropical oceans. The Roaring Forties of the Southern Ocean persist virtually all year, blowing powerfully between the oceanic subtropical highs and the circumpolar low-pressure region. Apart from Antarctica and Australia, the less extensive continents of the southern hemisphere do not have any substantial high associated with them. Only

Australia is large enough in the subtropical/middle latitudes to produce an anticyclone and, thus, influence the mean wind pattern regionally.

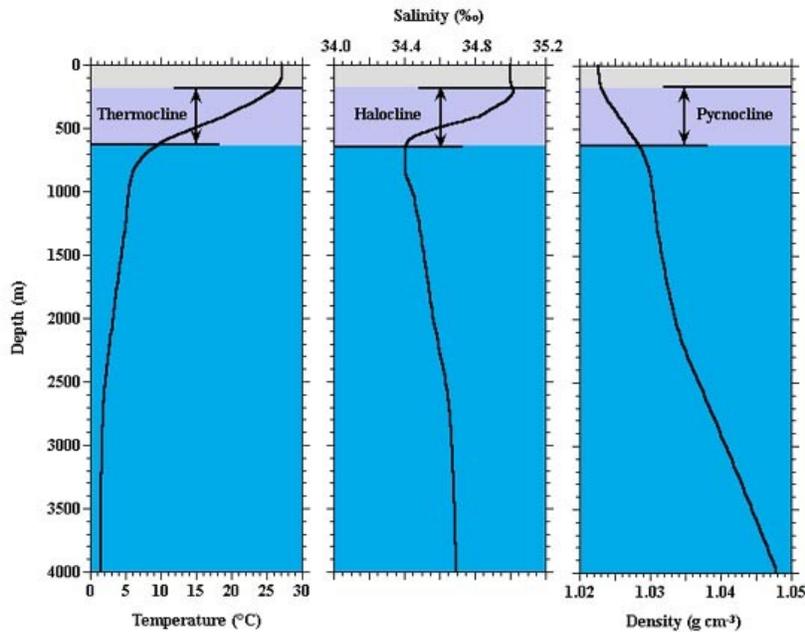
### Air Circulation Cells



14. Each hemisphere displays three distinct types of vertical air circulation, known as cells. The deepest, most powerful and most extensive is the Hadley, or tropical cell. It generally comprises very vigorous, tropical thunderstorms (known as "hot towers") associated with the low level convergence of warm, moisture-laden air in the ITCZ. Flow from the top of this thundery zone, in the upper troposphere, toward both poles. This air gradually cools as it moves poleward and, at around 30°N and 30°S, sinks through the troposphere. Surface return flows from subtropical highs toward the ITCZ as the Northeast and Southeast Trade Winds. Much weaker than the Hadley cell, the Ferrel, or middle latitude cell is comprised of low-level currents of air that flow poleward from the subtropical highs. A region of rising air, at around 50°-60°N and 50°-60°S, represented by the large-scale rise of the warm, moist air in frontal depressions. These common frontal depressions are the major source of precipitation for middle and higher latitude areas of the world, for example over much of western Europe the southern Andes and South Island, new Zealand. A return flow in the upper troposphere that heads toward the upper outflow from the ITCZ. These two flows converge above the subtropical highs, and are matched by the two currents that diverge directly below them at the surface. The final component of vertical air circulation is the weak Polar cell. It sinks gently in the highest latitudes, associated with surface highs. Surface flow toward the equator, some of which ultimately undercuts the warm-sector tropical maritime air in the frontal zone. This forms the leading edge of the polar air behind a cold front. A weak return flow from above the frontal depressions toward the poles.

### §20 Currents

A. Earth's oceans are immense. Approximately 70 percent of the Earth's surface is covered with oceans, 97% of Earth's water covering nearly three-quarters of the planet, 72%. Oceans cover 71% of the planet and are incredibly deep. Whereas the average height of the earth's land is 2,755 feet, the average depth of the world's oceans is 12,450 feet. On the surface, warm waters flow in great circular gyrations and sea level rises and falls with the rhythm of the tides and the undulations of the waves. In the deep sea below, the cold ocean moves in a slow and relatively steady course. Two of the most important characteristics of ocean water are its temperature and salinity. Together they help govern the density of seawater, which is major factor controlling the ocean's circulation, both horizontally and vertically.



1. The water molecule - two hydrogen atoms and one oxygen atom - has some truly amazing properties. It has a large, positively charged oxygen atom on one end, and two negatively charged hydrogen atoms on the other. These oppositely charged ends act like a magnet, the positive side attracting particles with a negative charge and the negative side attracting particles with a positive charge. Water dissolves more substances in greater quantities than any other liquid. When water molecules move about freely, they are water vapor - a gas. An increase in temperature will cause the water molecules in the gas to move around faster, causing it to expand and become less dense. In cooler temperatures, the molecules slow down and some form weak bonds between their hydrogen atoms, thus forming a liquid - water. The ocean can store great amounts of heat, because lots of energy must be added before the water molecules break their bonds and evaporate as water vapor. In really cold temperatures, all of the hydrogen atoms within the water molecules attach to each other in a six-sided ring and form a solid - ice. Because the angle between oxygen and hydrogen in the ice crystal is greater than in its liquid form, it is slightly more open and therefore less dense; this is why ice floats in water. When seawater freezes, salt crystals cannot quite squeeze into the ice structure, so they are excluded and the salinity of the surrounding water increases. The attraction of hydrogen atoms in water also produces a high surface tension. The only liquid with a higher surface tension is mercury, well-illustrated by its ability as a liquid to form small beads and roll around. Probably the most important properties of seawater is its density. The density of seawater increases when either

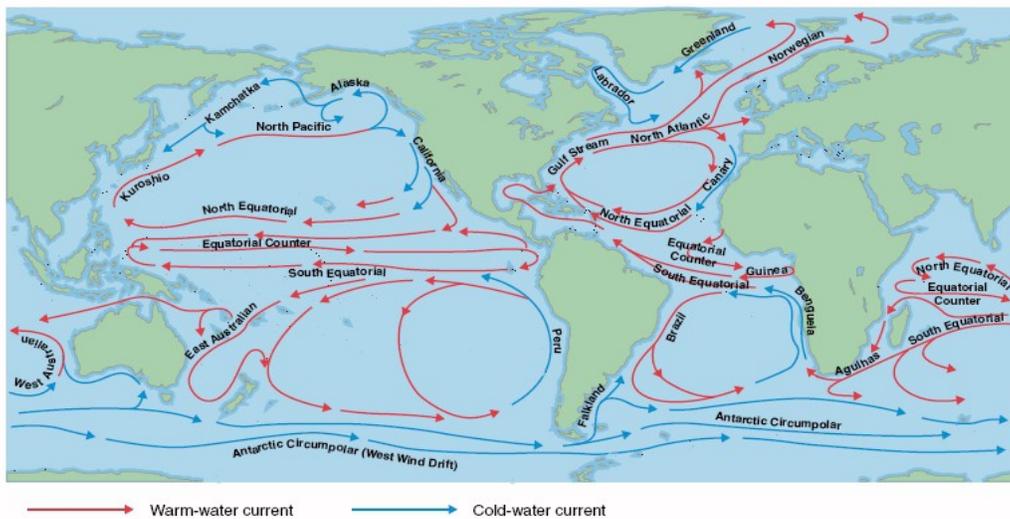
temperature is lowered or salt is added; conversely its density decreases when heated or fresh water is added. An increase in salinity will raise seawater's boiling point and lower its freezing point and vice versa. The oceans transport warm water on the surface and cold water below. Winds transport heat, create waves, and drive currents on the ocean's surface.

2. The saltiness of the sea generally refers to the amount of dissolved inorganic minerals (salts) in the ocean, in scientific lingo this is called salinity. Within seawater, dissolved salts are in the form of ions, or charged particles. The most common ions - the major constituents of seawater - are chloride (55 percent by weight), sodium (31 percent), sulfate (8 percent), magnesium (4 percent), calcium (1 percent), potassium (1 percent) and bicarbonate, bromide, boric acid, strontium, and fluoride (all less than 1 percent). The ocean also contains dissolved gases (carbon dioxide, nitrogen and oxygen), nutrients (silica, nitrogen and phosphorous) and minute or trace amounts of iodine, iron, manganese, lead, mercury and gold. There are three main sources of the sea's saltiness: weathering of rocks on land, volcanic gases and circulation at deep sea hydrothermal vents. When water combines with carbon dioxide it becomes acidic. Consequently, rain tends to be slightly acidic, dissolving rocks and sediments in a slow process called weathering. Calcium carbonate rocks are particularly vulnerable to weathering by acidic rainwater. River water has less chloride and calcium and more magnesium than ocean water. Volcanic eruptions that spew gas rich in chlorine and sulfate from Earth's interior account for some of the missing constituents. Deep-sea vents or chimneys occur along mid-ocean ridges where plumes of mineral-rich superheated water erupt from fissures in the seafloor. Heated by molten material below, the temperature of the water emanating from an active hydrothermal vent field can range from a warm 25°C(77°F) to a fiery 400° C (752°F). Intense pressure at vent depths some 2500 meters below the sea surface allows the water temperature to rise above its boiling point and remain as a liquid, hence the term superheated. Because the hot vent water is less dense than the surrounding cold seawater, buoyancy continues to drive it upward. In some areas, superheated water escaping from the vents becomes trapped under ledges. Some scientists estimate that the entire volume of the oceans may circulate through the underlying oceanic crust in 10 million years or less. Chemical interaction with the underlying molten material causes circulating seawater to lose magnesium and gain calcium. On average, 1 kilogram of seawater contains 35 grams of salt, 35 parts per thousand (ppt). While salinity may vary between 30 to 37 ppt, it always has the same ratio of elements (55 percent chloride, 31 percent sodium, 8 percent sulphate, etc.). Traditionally, chemists measured seawater's chloride content to determine salinity. salinity Sensors to measure salinity, temperature and pressure (for depth) are often combined in an instrument package called a CTD (conductivity, temperature and depth).

B. The continual, unstoppable circulation of water occurring below the ocean surface is known as thermohaline circulation (THC). In the case of the Atlantic and Gulf Stream currents, warm, salty water from tropical latitudes is transported northward, where the naturally colder weather extracts heat from the surface water, thereby allowing it to cool, increase in density and sink. That water then flows back toward the equator. Similar mechanisms take place across the globe. Occasionally perturbations in the various currents create alterations that impact weather patterns. One such shift is the periodic El Nino current, which is notorious for causing horrendous flooding on the West Coast. Likewise, its counterpart, La Nina, can cause cold temperature delays in the farming season in the Northern Plains and create conditions that can whip up a 100 year flood in the Missouri and Mississippi Valleys. In addition a variance known as the Pacific Decadal Oscillation can raise the temperature in the Arctic, melting summer ice. According to the IPCC's Fourth Assessment produced in 2007, over the past 20,000 years sea level has increased nearly 400 feet. Over the past century the average sea level rose a mere 1.8 millimeters per year.

1. The pattern of large-scale ocean surface currents is more or less a mirror of the average wind patterns at the surface. In other words, the sea-surface circulation is essentially wind-driven, although both warm and cold ocean streams do have an important impact on the weather and climate over the sea and across adjacent land areas. The Gulf Stream, the North Atlantic Drift and the Kuro Siwa are all examples of warm water being exported from the tropical boilerhouse and all three have a significant impact on the climates of distant shores. The principal warm ocean current of the southern hemisphere are known as the Brazil and Agulhas Currents. The extensive region of warm water that washes the shores of eastern Australia is also significant. In contrast, the cool Canaries and the California Currents are parts of the grand design to transport cooler water toward the equator for warming. On the way, they influence the weather along the adjacent coastlines dramatically. They do this because when their cool waters are overrun by relatively warmer and damp air, extensive sea fog or low-level layer cloud is formed as the lower atmosphere is chilled. The western flanks of the southern continents are influenced by cold oceanic flows toward the equator in the form of the Peru (or Humboldt), the Benguela and the West Australian Currents. As with the cold California Current, the Humboldt Current is associated with the extensive low cloud and sea fog that occurs along the part of the coasts of Peru and Chile. In comparison to the northern hemisphere's ocean circulation, the southern oceans are markedly cooler, because they are influenced by the cold Antarctic Circumpolar Current at high latitudes.

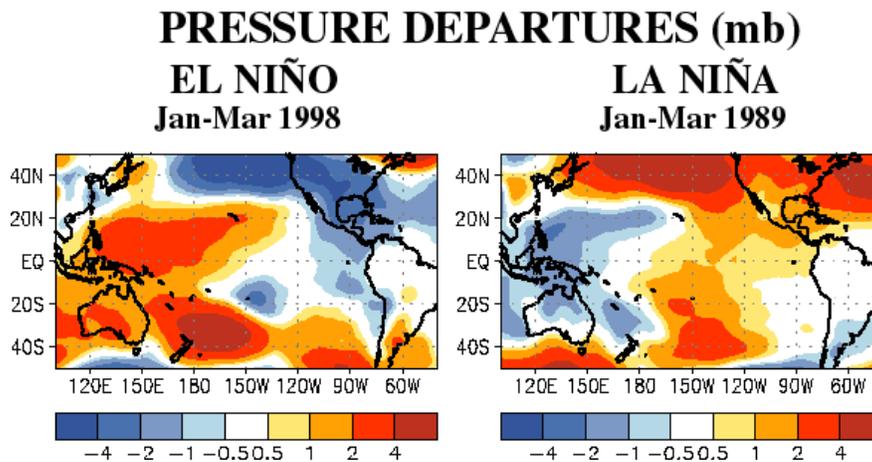
### Ocean Currents



Credit: Maricopa.edu

C. El Niño and La Niña together, make up the El Niño Southern Oscillation (ENSO). A La Nina event involves abnormally cool water in the equatorial Pacific, while El Niño occurs when the water is warmer than average. The recent results of 20 computer models showed that surface temperatures in the equatorial eastern Pacific could rise above 28 degrees Celsius more frequently. At that temperature, an extreme El Niño event can be triggered. Intense El Niño periods could double in frequency as the Earth's average temperature continues to rise, warned an international team of atmospheric scientists and oceanographers. The researchers forecast higher warming of the eastern Pacific Ocean near the equator, relative to surrounding waters, based on 20 computerized models of the planet. Extreme El

Niño events may cause deluges in the United States and Peru, yet leave the other side of the Pacific deathly dry. The 1982-1983 El Niño caused disastrous flooding in Peru. Yet the same event resulted in droughts in Indonesia and Australia. The '82-'83 event also hurt marine life and people dependent upon that life. The warm surface waters of El Niño cut off the circulation of cold, nutrient rich water from deeper in the Pacific. The lack of deep-water nutrients knocked out the base of the marine food chain and thereby starved both fish and fishermen. During the 1997-1998 El Niño, torrential rains flooded California and caused disastrous mudslides.



1. The equatorial Pacific not only experiences el Niño however; on occasion the South Oscillation (SO) index can experience its antithesis known as la Niña. During la Niña the central and eastern tropical Pacific waters tend to become much cooler than average. La Niña is also linked to generally cooler than average surface land temperatures across the tropics and subtropics in Asia. High pressure and temperature develop around the San Joaquin Valley in California. There is also evidence of increased tropical storm activity in the North Atlantic during la Niña and decreased activity during el Niño. Relatively wet weather occurs across large areas of Indonesia, Australia and southern Africa, while lower than average rainfall is observed over southern Brazil, Uruguay, northern Argentina and east Africa. The North Atlantic Oscillation (NAO) is a phenomenon that is essentially a "see-saw" in mass exchange between the North Atlantic's Azores High and Iceland Low during the winter season. A negative NAO index means much weaker than average flows across the Atlantic toward Europe, and cooler winters across much of that continent. A positive NAO index occurs when there is a large pressure difference between the Azores and Iceland; such a steep gradient is associate with stronger westerly flow into Europe and generally more vigorous starveling lows. It is linked to milder, wetter than average winters over much of Europe and also to cooler than average conditions across comparable eastern North American latitudes.

2. El Niño is associated with an atmospheric phenomenon known as the Southern Oscillation (SO). Pressure is normally high over the southeast Pacific and low in the western equatorial Pacific. The horizontal gradient of pressure between these two centers leads to the presence of the easterly (westward-blowing) Trade Winds. During such times, the SO is said to be in its High Index. Sometimes, however, the barometer falls over a period of months across the southeastern Pacific and, when this happens, it rises simultaneously in the western Pacific. This change leads to a weakening of the pressure gradient, together with a weakening - or even a reversal - of the Trades. This is known as

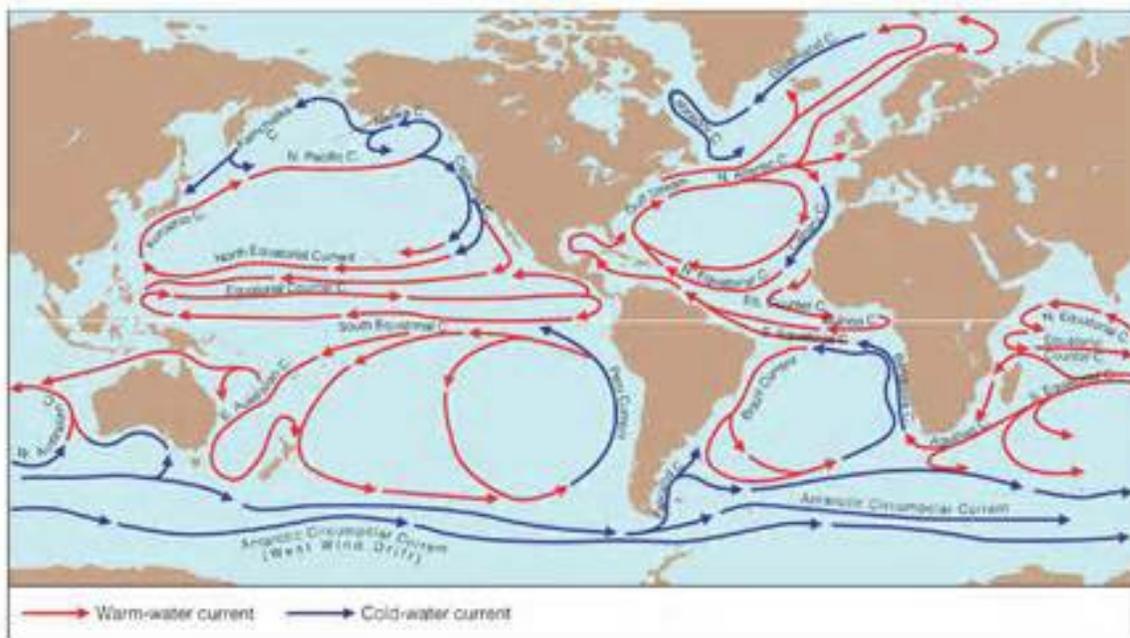
the Low Index of the SO. During such phases there are droughts in Australia, Indonesia, India and parts of Africa. In addition winters tended to be unusually warm in western Canada. Furthermore, the desert islands in the middle equatorial Pacific suffer persistent and torrential rains. SO and el Niño are both parts of the same phenomenon known collectively as ENSO. During normal, or average years, the easterly winds that blow along the equator and the southeasterlies that blow along the coast of Ecuador and Peru, drag surface water along with them. The rotation of the Earth deflects this water to the right of the flow in the northern hemisphere, and to the left in the southern. This means that water is driven away from the equator in both hemispheres and also from the Peru-Ecuador coastline. Cold, nutrient-rich water wells up from below to replace it, forming narrow zones of equatorial and coastal upwelling less than 90 mi (50 km) wide. Normal conditions are marked by cool temperatures over the eastern Pacific and a warm maximum over the equatorial western Pacific. This western area is so warm that very deep convective cloud and heavy rainfall are a hallmark. Part of the huge volume of air that ascends to great height within these clouds - as high as the upper troposphere - moves eastward at these levels and sinks in depth across the eastern Pacific. This vertical circulation is called Walker cell. A number of these cells exist around the equator, connecting wet and dry regions. The descending portions of such cells are characterized by very dry and often cloud-free weather.

3. During el Niño, the warm surface water flows east along the equator, bringing thunderstorms. The classic el Niño conditions include unusually high rainfall across the central equatorial ocean, as well as unusually dry conditions over the western sector, including northern South America, eastern Australia and over Indonesia. This distinct pattern is due to the fact that one portion of the enormous upward movement of air in the displaced convective region subsides over the western Pacific. After the Kelvin wave has left the western Pacific, the warm water layer thins substantially and mixes with cooler water. This cooling leads to less evaporation and a more stable atmosphere, which together mean less rain. The eastern half of Australia and Indonesia, therefore, are susceptible to drought during a marked el Niño. There are other typical thermal and precipitation anomalies associated with a strong el Niño. The period from June to August that follows the evolution of the el Niño tends to be characterized by drier than average conditions around Indonesia, Australia and the Fijian Islands. Drought is a risk across the northern part of South America and the southern Caribbean too - and there is evidence that the Indian monsoon may be drier. Dry conditions stretch from Sumatra and southern Malaysia to the Hawaiian Islands in the north, and the Fijian Islands in the south. Additionally, drought is a high risk for eastern equatorial South America and southeastern Africa. Abnormally wet conditions occur over Ecuador, Peru, southern Brazil, Uruguay, northern Argentina, southern USA and equatorial east Africa. Warmer than average winter conditions are often experienced from Alaska to the Canadian Rockies, in parts of southeastern Canada and northeastern USA and around Japan. The equatorial Pacific not only experiences el Niño however; on occasion it can experience its antithesis known as la Niña. During la Niña the central and eastern tropical Pacific waters tend to become much cooler than average. La Niña is also linked to generally cooler than average surface land temperatures across the tropics and subtropics. There is also evidence of increased tropical storm activity in the North Atlantic during la Niña and decreased activity during el Niño. Relatively wet weather occurs across large areas of Indonesia, Australia and southern Africa, while lower than average rainfall is observed over southern Brazil, Uruguay, northern Argentina and east Africa.

D. In a single day, the entire planet spins once around to the east. Because the circumference of Earth is great at the equator than at the poles, the Earth must move faster at the equator than at the poles for both places to rotate completely in the same amount of time. Earth moves approximately 1600 kilometers per hour (1000 mph) at about 2 degrees of latitude and 800 kilometers per hour (500 mph) at

60 degrees of latitude. The resulting Coriolis effect can be observed in that ice movements were not parallel to the wind, but at an angle some 20 to 40 degrees to the right of the wind. If the direction of flow is averaged over the entire mixed layer the net transport is about 90 degrees to the right. Ekman transport is very important along continental margins where it can cause coastal upwelling. Several regions of the world wind blows parallel to the coast and Ekman transport causes the surface water to flow offshore. To replace the offshore-flowing surface water, cold nutrient-rich water wells upward from below; this is called coastal upwelling. Areas of coastal upwelling are some of the most fertile regions in the sea. Here, phytoplankton (floating plants) use upwelled nutrients to photosynthesize and grow in prolific numbers. Then, as long as upwelling continues, zooplankton (floating animals) and small fish come to dine and prosper on the constantly replenishing smorgasbord of food. Off Peru, along South America's west coast, northward blowing winds cause upwelling and create one of the richest anchovy fisheries in the world. Coastal upwelling also occurs off the coast of California and, during the summer, off the northeast coast of Africa. During years when El Niño is particularly powerful, coastal upwelling weakens and major fisheries typically collapse. Upwelling also occurs within the equatorial region of the sea and in the southernmost ocean (north of Antarctica). Near the equator the trade winds blow from east to west and Ekman transport causes the surface waters to deflect to the north and south, away from the equator. Cold nutrient-rich waters well upward from below and create a narrow equatorial zone of fertile water rich with life.

### Ocean gyres



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1. The combined effects of wind-driven motion at the sea surface and the distribution of land cause the surface waters to the global ocean to move in a series of large circular flows, called gyres. These gyres are distinct

features within the world's oceans; they are separated by flow at the equator and play a major role in the transport of heat in the sea and air. Circulation in the North Atlantic ocean illustrates how gyre systems form and operate throughout the sea today. Winds over the northern half of the North Atlantic tend to blow toward the east, and in the south, the trade winds blow toward the west. Oceanographers name winds and currents based on where they are flowing to, and meteorologists name them on where they are coming from. So the trade winds that blow from the east are easterlies to the meteorologist and westerlies to the oceanographer. With the winds blowing from the west in the north and east in the south of the North Atlantic, Coriolis and Ekman transport cause the surface water to flow toward the middle of the North Atlantic Ocean. The convergence of surface water causes a literal pileup of water in the middle, in an area known as the Sargasso Sea. Common in the Sargasso Sea are the amazing flying fish. These fish propel themselves out of the water and glide effortlessly over the surface using their tails as rudders and outstretched fins as wings. Flying fish have been known to fly onto boat decks. Surface water continually piles up at the center of the Sargasso Sea. Consequently, a pressure gradient forces water to flow outward beneath the surface pile. As water flows outward below, Coriolis comes into play and the moving water curves to the right. This process - surface water piling up, flowing outward and to the right below the mixed layer - creates a large gyre of currents circulating clockwise in the North Atlantic. A similar pattern occurs in the South Atlantic except that because Coriolis acts to the left, the gyre circulates counterclockwise. Ocean gyres also occur in the Pacific and Indian oceans, although the Indian Ocean system is modified by seasonal changes in the monsoon winds. Around the Antarctic, where no land boundaries exist to block flow, a globe-encircling, or circumpolar, current flows around the entire Southern Hemisphere. Additionally, beneath the westward-flowing equatorial currents lies an undercurrent going in the opposite direction. Typical open-ocean currents, not including boundary currents such as the Gulf Stream and its Pacific counterpart, the Kuroshio, flow at speeds of less than 2 kph (1 mph).

2. Just as wind drives circulation at the ocean's surface, gravity drives flow in the deep sea. On average, the ocean is some 4 kilometers (2.5 miles) deep. Therefore, most of the ocean lies below the mixed layer. Beneath these two areas lies the deep sea. Water motion in the deep sea is slow, driven by gravity and caused primarily by changes in the density of seawater. The cooler and more salty the sea gets, the heavier and denser it becomes. For the most part, it is at the surface, the interface of the air and sea, that temperature or salinity change. The cooling of the sea takes place when a chill wind blows over the surface or a cool air mass sucks the warmth out of the sea. An increase in salinity can occur with evaporation or the formation of sea ice. If the density increase due to these processes is sufficient, ocean water will slowly sink and flow downward until it reaches a level of equal density or the seafloor. Almost all of the ocean's deep water forms through the effects of cooling and freezing at high latitudes. Little bottom-water actually forms in the Pacific or Indian oceans; most of it comes from the Atlantic. By far, the area that generates the most bottom water lies just south of Greenland in the North Atlantic. Here, the warm, salty waters of the Gulf Stream merge with cold waters flowing south around Greenland. When these waters collide they produce prodigious amounts of cold, salty water that cascades downward and spreads throughout the deep Atlantic. This deep-water mass is known as North Atlantic Deep Water, mixes with water flowing around Antarctica and then moves into the Pacific and Indian oceans. The very densest seawater forms during the southern winter beneath the Antarctic ice shelf. Here, the water is extremely cold and very salty, so it sinks all the way to the seafloor, spreads out, and flows northward, beneath the somewhat less dense, southerly-flowing North Atlantic Deep Water. However, Antarctic Bottom Water generally stays in the Atlantic Ocean because ridges on the seafloor block its path. Cold bottom water also forms during the winter in the Arctic, but because of the surrounding continents and seafloor ridges it remains within the Arctic Ocean basin.

Since there are few means of mixing water in the deep ocean, water masses tend to move as distinct layers flowing within the sea. Each water mass has a suite of characteristic properties, such as temperature, salinity, oxygen, and silica content.

### Ocean Depths

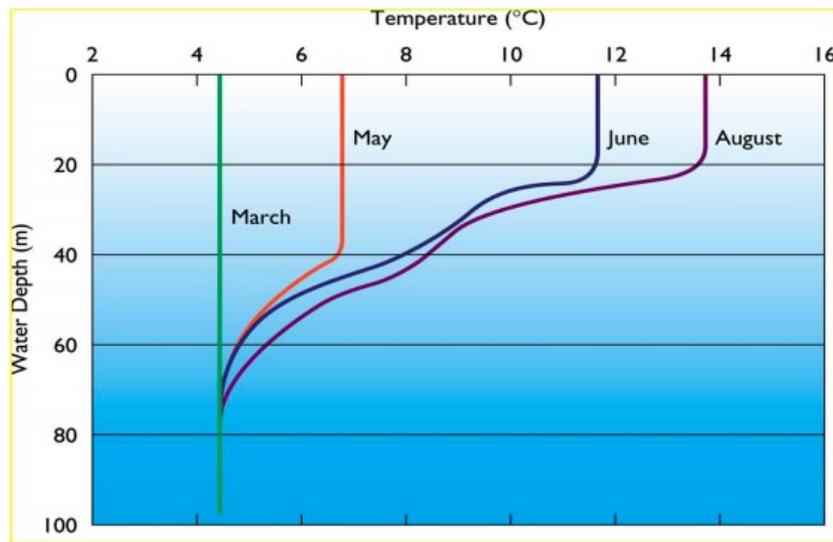


3. In between the surface and deep waters of the sea lies the intermediate ocean. In some places, water masses form and flow into the intermediate ocean, wedged between the warm waters of the surface and cold waters of the deep sea. In the Mediterranean Sea intense evaporation creates a very salty, warm intermediate water mass that flows out through the Straits of Gibraltar, beneath less salty, incoming surface water. Even though it is warm, the Mediterranean water is so salty that when it enters the North Atlantic it spills downward to a depth of about 1000 meters, where colder water is of an equal density. Sandwiched between the upper and lower layers of the ocean, Mediterranean intermediate water forms a salty liquid avalanche spreading down and out. Scientists have nicknamed the Mediterranean water eddies as Meddies, and have tracked them for up to 7 years as they slowly drift within the intermediate depths of the sea.

4. Within the global ocean are smaller-scale features that play a supporting role in the big picture and greatly influence coastal environments. Partially enclosed, relatively large embayments of the ocean are called regional seas, or gulfs. Examples include the Gulf of Mexico, the Gulf of Maine and the Caribbean Sea. Circulation within a gulf or sea may be controlled by local changes in depth, river inflow, wind and ocean currents. Seasonal increases in river discharge can often be traced as a spreading plume of freshwater. For instance, using satellite imagery or water mass properties, the outflow or plume of South America's Orinoco River can sometimes be traced for hundreds of kilometers as it flows into the Caribbean Sea. The narrow, swift flow and incessant wanderings of the warm Gulf Stream are one of the dramatic and easily observed physical phenomena in the sea. The first chart of the Gulf Stream made by Benjamin Franklin and his whaler cousin, Timothy Folger,

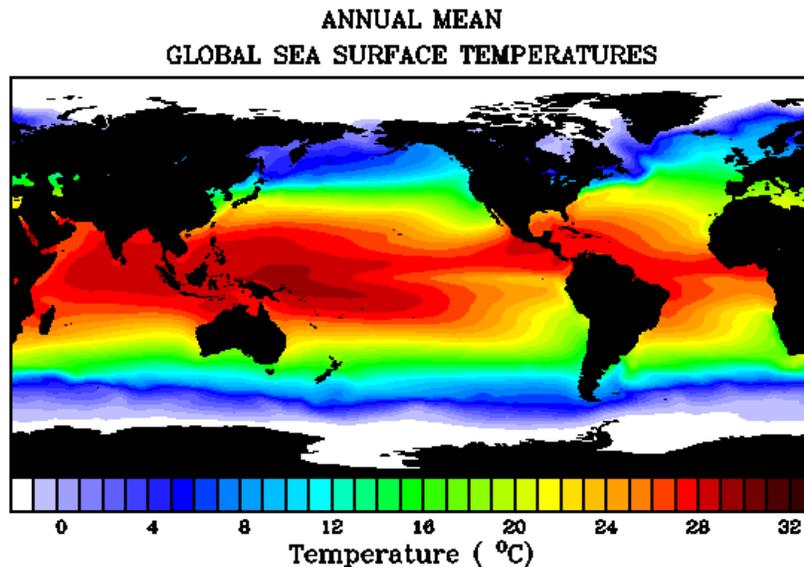
shows a relatively large river of water moving northward along the coast from Florida up to North Carolina, where it veers to the east, widens and continues across the North Atlantic. The Gulf Stream is approximately 50 to 75 kilometers wide, about 2 to 3 kilometers deep, and flows at a rate of 3 to 10 kilometers per hour. It has been estimated that in some areas, the Gulf Stream transports somewhere on the order of 70 million cubic meters of water each second, about a thousand times the amount of water moved by the Mississippi River. When the Stream bends to the north, breaks off, and forms a ring, it is called a warm-core ring. They are usually 100 to 200 kilometers across and have a central core of warm subtropical water from the Sargasso Sea and cooler, outside waters that rotate clockwise. A meander that bends southward, breaks off, and traps cold water at its center forms a cold-core ring rotating counterclockwise. There can be 10 or more rings at a single time, each drifting slowly westward for an average of about 4 ½ months. Eventually rings coalesce with the parent Gulf Stream and disappear from view. The Gulf Stream has an important influence on climate. It is a great transporter of heat from the tropics to the poles and brings warmth to coastal lands on the East Coast of the United States and along the western shores of Europe. Tropical fish have even been found along the shores of Cape Cod, carried off-course by the Gulf Stream. To the north, where its warm waters collided with the cold waters of the Labrador current, thick banks of fog hover over the sea and land.

### Thermocline



E. Within the ocean there is a layer with a depth of 330 ft (100 m) or so, through which the water temperature drops rapidly. Known as the thermocline, it separates the upper warmer zone from the much colder deeper reaches. Normally, the thermocline is near the surface in the eastern equatorial Pacific, some 160 ft (50 m) down, and it slopes gently down toward the western side, where it is found at a depth of about 660 ft (200 m). If there were no wind stress on the surface of the ocean, the thermocline would be nearly horizontal. In this region, however, the persistent Trades drive water westward, lifting the thermocline toward the surface in the east, and depressing it in the west. The fact that the westward-driven surface water is steadily warmed by sunshine and, therefore, is lower density means that the surface of the sea slopes up toward the western equatorial Pacific. When the Trades are blowing at their strongest, the sea level in the western basin is over 1.6 ft (0.5 m) higher than in the east. This very broad, flattened mound of warm water occurs around Indonesia and New Guinea. As the SO index gradually moves to a low-value phase, when the Tahiti/Darwin difference is small, the

relaxation in the normally strong Trades leads to the thermocline becoming less tilted. It drops by more than 330 ft (100m) in the east and cuts off the cool, upwelled water from the Ecuador/Peru coastal zone. Thus, the sea level flattens out along the equator, falling in the west and rising in the east. In association with this, the warm surface water flows eastward as a long, low wave known as a Kelvin wave, reaching South America a few months later, where it turns north and south along the coast. This leads to an increase in sea level and the migration of fish. The northward branch of warm water influences marine life as far north as Vancouver, Canada. The eastward migration of the warm water across the equatorial Pacific causes the air above it to become moist and warm. It also gains sufficient buoyancy to produce massive convective cloud and torrential rain in regions that otherwise are persistently arid.



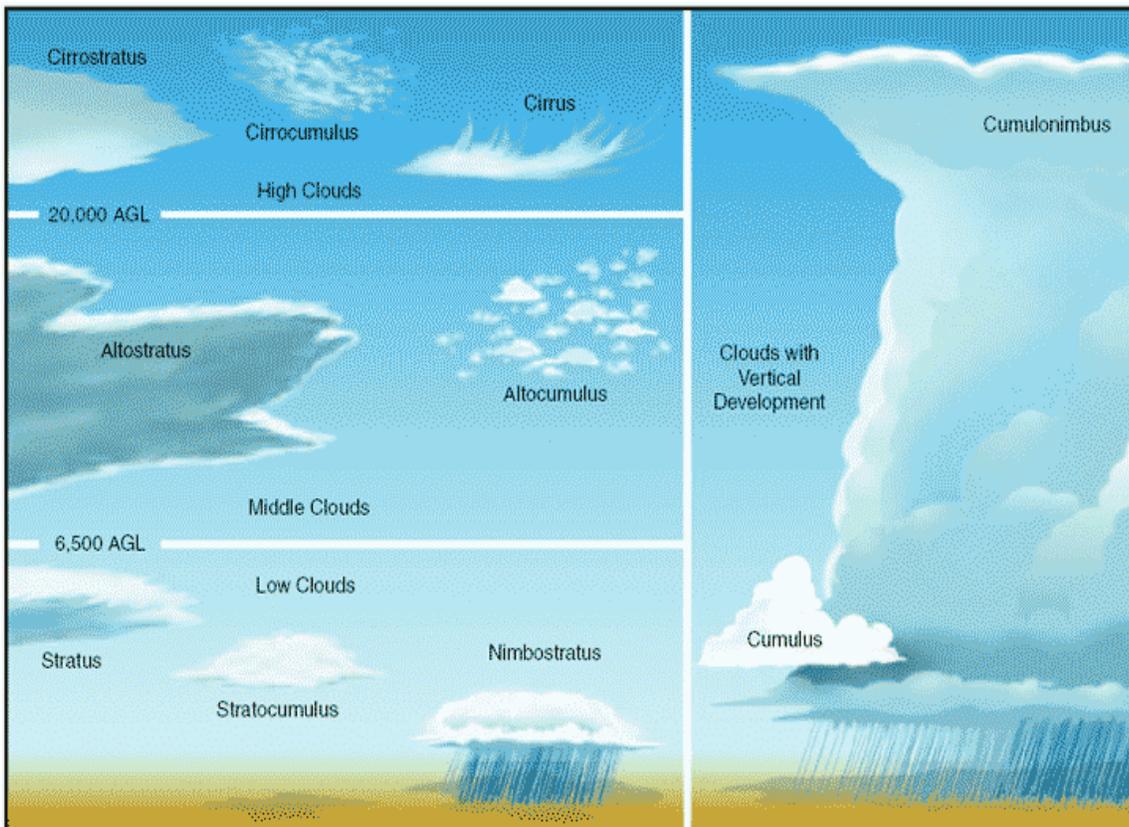
1. Sea surface temperature (SST) and Anomaly is one of the most important indicators of climate variability and long-term climate change. The Australian Bureau of Meteorology and the National Oceanic and Atmospheric Administration (NOAA) produce global maps to monitor surface temperature. SSTs are used to monitor many modes of climate variability such as El Niño–Southern Oscillation (ENSO), the Pacific decadal oscillation (PDO), the Atlantic multi-decadal oscillation (AMO), and the Indian Ocean dipole (IOD). Heat loss estimates have been made for SST measurements from buckets that occur during the time between the hauling of buckets from the ocean surface and the reading of thermometers.

## §21 Clouds

A. Water is heavy, near sea level, a cubic meter of air weight about 2.6 lb (1.2 kg) while one of water weight 2,200 lb (1,000 kg). Clouds stay aloft, despite the weight of the water, because they are associated with rising air. A cloud's look and extent are expressions of how the air has risen to produce them Extensive layer cloud- like stratus or stratocumulus - are formed by widespread ascent that is relatively gentle. In contrast, puffy cumulus or cumulonimbus are related to strongly ascending air across a more limited area. In general air ascends in small cumulus clouds at a rate of 1-5ms, whereas large cumulonimbus clouds have air rushing through at up to 30 ms. All clouds are formed by the cooling of moist air down to its dewpoint temperature. Further cooling causes the water vapor to

condense gradually out of the air as myriad cloud droplets. The amount of water vapor contained in saturated air depends on the air temperature. Cold air is capable of holding small amounts while very warm air can contain much more. This marked increase in the saturation value of water vapor with temperature means that moist, cold air generally produces less precipitation than moist, warm air. The most common way that damp air cool enough to produce cloud droplets or ice crystals is by ascending. In some cases, a volume of ascending air may be about six hundred feet across (200 m); in others, it may be as long as six hundred miles (1,000 km) across. The speed with which air rises varies.

1. All cloud droplets have a nucleus around which they have condensed - known as the cloud condensation nucleus (CCN). These microscopic particles have a variety of sources, including blowing soil, volcanic eruptions, industry (e.g. smoke) and the spray from breaking waves. Their number varies from ocean to continent, and with height within the troposphere, but a typical value at sea level is around 100-200 million in every 35 cubic feet (or every cubic meter). Cloud droplets vary in size depending, for example, on the number of such condensation nuclei, how much water vapor there is available, and the strength of the up-currents within the cloud. The incredibly tiny cloud droplets are so small that their terminal fallspeeds are much lower than the speed of the updrafts that create the clouds. They settle at about 1 cm/sec, while the larger ones do so at about 1 ft/sec (30 cm/sec). Generally, larger cloud droplets are found in convective clouds (cumulus clouds, formed by relatively warm air that pulls away from the Earth's surface; these generally fairly small clouds transport heat up into the atmosphere by the process of convection), where they can grow within the fast updrafts.



2. Meteorologists recognize a large variety of cloud types. They are defined in basic ways related to their essential shape: for example, a sheet or layer is "stratiform" while those with lumpy upper

surfaces and flat bases are "cumuliform". The terms "stratus" - for layer cloud - and "cumulus" - for lumpy cloud - are the basic building blocks for cloud names. In addition to these indicators of form, meteorologists recognize three different heights at which clouds occur - simply low, middle and high. Which level a particular cloud falls into depends on the height of its base above the surface. So, low cloud can, for example, be stratus (a monotonous layer of cloud); stratocumulus (a sheet of cloud that has a subtle "lumpy" form to it); cumulus (a shallow, bubble-topped cloud); or cumulonimbus (the tallest, or deepest, cumulus cloud from which a shower falls - indicated by the inclusion of "nimbus" in its name). The many varieties of cloud at middle levels are prefixed by "alto" - altostratus and altocumulus, for example. In addition, nimbostratus occurs at middle levels, as a deep layer of precipitating cloud. The highest level clouds are prefixed by "cirro". In contrast to the low and middle types, they are composed entirely of ice crystals. As well as cirrostratus and cirrocumulus, there are the elegantly striated "cirrus" that can occur as patches or long fibrous elements, which don't fit either of the cumuliform or stratiform forms. Clouds are formed by moist air rising in air bubbles. However, moist air also rises on a very much larger scale within lows, or depressions. This occurs across tens to hundreds of thousands of square miles of the earth's surface during the formation of a typical low. Therefore, depressions are cloud laden, often with deep layer cloud that can produce widespread precipitation. As lows track across the earth, the cloud is borne with them.

B. So long as the ascending or descending air is unsaturated (cloud-free), it will cool or warm respectively at the rate of 5.5°F per 1,000 feet (9.8°C per kilometer). Once condensation begins, a cloud appears. The process of condensation actually releases heat, which warms the surrounding air. This means the ascent within clouds causes the air to cool much more slowly than in cloud-free ascent. Some days, conditions can be such that convective clouds develop into a distinct pattern of long lines, separated by clear air. These lines may stretch for many tens or hundreds of miles along the direction of the wind and are known as cloud streets. They are formed when there is a temperature inversion (a rise in temperature with height) a few miles above the surface, and when the wind direction remains constant with height below this level, with a speed of at least 13 knots at the surface. Since the streets occur when an inversion is present, the clouds do not usually become deep enough to produce any precipitation. Cloud streets are common over mid and high latitude oceans in the fall and winter, and over the land in spring and summer.

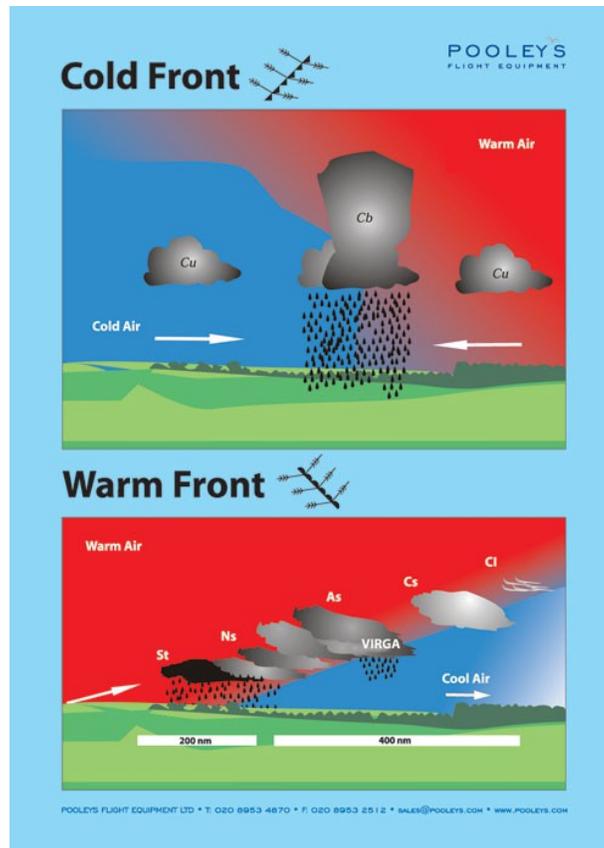
1. Air has no choice but to flow over and around upland areas. If the air is damp, its forced ascent (termed orographic uplift) can often lead to saturation and condensation into orographic cloud. Such cloud is commonly thick stratus with a base below the tops of the hills over which the damp air flows. This situation produces hill fog for upland areas shrouded in such cloud- hilly areas are often cloudier than adjacent lower land because of the orographic effect. The amount of uplift required depends on how close the air is to saturation point. Very dry air will require a good deal of cooling (uplift) to reach its dewpoint temperature, while very damp air will need only slight ascent to produce cloud. Within warm sectors of a weather front, rain is commonly subjected to a process known as orographic enhancement. Upland regions of South Wales in the UK, for example, can experience a fall of rain that is two or three times more intense than that falling on the coast at the same time. Careful study of this phenomenon has defined the conditions required to produce significantly heavier rain in upland areas - it is not true that a moist airstream crossing a hilly district will always generate more rain. Orographic enhancement occurs in warm sectors when there is a precipitating layer of cloud at a height of about 1 to 2 mi (2 to 3 km). This layer will not be related to the hills in any way, but to the large-scale flow of the frontal depression. Sometimes, as this layer moves across the hills, the rain it produces falls through cloud that has been generated by a strong, low-level stream of moist air flowing up and over

the hills, visible as orographic cloud. While the situation persists, the rain washes out large quantities of water from the lower cloud, thus increasing rainfall over the hills compared to other areas. If the lower cloud is constantly replenished by a strong surface flow of damp air, there will be a prolonged period (over many hours) of orographic enhancement. However, if the surface flow is weak, the water will soon be washed from the cloud, and not replenished at a rapid enough rate, providing only a fleeting addition to the catch over the hills. This action occurs across many middle-latitude hilly areas that are frequented by frontal depressions. It is the explanation for example, for the wet reputation of upland North Wales, Western Scotland and the Lake District in the UK. Other upland areas of the world that lie in the track of frontal cyclones also see orographic rain and snow. These include the Norwegian mountains, the Rockies of northwestern USA and western Canada, the southern Andes and the mountains of South Island, New Zealand.

2. Under special conditions of wind and temperature change with height, hills and mountains can generate standing waves, anchored to the hills and mountains that produce them, in the airflow above and downwind of them. These lee waves are indicated by cloud in the ascending air, contrasting with clear areas where the air descends. Such waves can appear over a distance of 60 mi (100 km) or more, to leeward of upland areas. Lee waves can be compared to the standing waves sometimes seen in streams where water flows over large stones. The flow creates a pattern downstream, in which the waves are stationary, but the water flows quickly through the pattern. The ribbed cloud pattern associated with lee waves will exist for some hours, rather than days, until the large-scale weather pattern that favors their development changes. The lenticular (lenslike) clouds produced by the wave pattern do not produce precipitation. On some occasions, the droplets that compose the lee wave clouds freeze and, if the air is humid enough, an extensive sheet of ice crystals develops, which will be carried many kilometers/miles downstream by the wind.

C. Fronts are significant weather features in middle and higher latitudes. Fronts are shallow sloping zones that separate extensive air masses that have different values of temperature and humidity. Cold and warm fronts are the leading edges of cold and warm air masses that sweep generally toward lower or higher latitudes respectively. Cold fronts are somewhat steeper and warm fronts somewhat shallower. A front is normally about half a mile (1 km) deep, which means that it intersects the surface across a region some 60 mi (100 km) wide. Therefore, the weather changes associated with a front do not normally occur instantly, but gradually over a transition zone. Broadly, the passage of a warm front brings warmer, moister air and a veering of the wind direction. This means that the wind shifts in a clockwise direction, typically over the space of an hour or so, from southeasterly to southwesterly in the northern hemisphere in the southern hemisphere, the wind will shift from northeasterly to southwesterly. The area ahead of an approaching warm front is often influenced by the signs of the advancing warm, moist air as it glides across the sloping zone between the two air masses. In fact, much of the warm air streams beyond the line where the front meets the surface. High above the Earth's surface, the first signs of cirrus cloud will occur. This can be as far as 370-430 mi (600-700 km) ahead of the warm front at the surface. As the warm front approaches point on the surface, the base of the cloud produced by the overrunning warm, moist tropical air gradually lowers. This is indicated by the gradual progression from cirrus to cirrostratus/cirrocumulus, followed by altostratus/altocumulus and a thickening into nimbostratus, which will produce precipitation that reaches the surface. Closer to the surface, the rain falling through the very damp layer below the nimbostratus cloud will evaporate a little, cooling the air slightly as a result. Sometimes, this process leads to condensation in the damp air, creating "scud" or fractostratus, clouds. These are the ragged low clouds that fly across the sky during conditions of strong winds and moderate or heavy rain. The

leading edge of the warm frontal rain can occur some 120-180 mi (200-300 km) ahead of the surface front and cause a few hours of precipitation before the arrival of the warm sector air. Precipitation rates in this region would be something like a few millimeters an hour, although radar observations reveal that rain bands often occur, with heavier, localized bursts.



1. During the lifecycle of frontal systems, occlusions naturally evolve, An occluded front is a front with warm air lifted off the surface, with cool or cold air at lower levels. Because a cold front travels faster, it tends to scoop the warm air up away from the surface when it catches up with the warm front. This "occlusion" grows in length with time until a low, in its dying stages, is fully occluded. At the same time, deep layers of warm, moist air ascend continuously over the gently inclined warm and cold fronts, to produce very extensive condensation in the form of cloud. Frontal systems have characteristic large-scale currents of air that move in an organized fashion. The major cloud-producing flow is called the arm conveyor belt, which streams through the warm sector ahead of the cold front. It ascends gradually from a mile or so above the ground surface, eventually flowing over the warm front up to 3 or 4 mi (5 or 6 km) above the surface. This feature is called a conveyor belt because it transports most of the all-important heat and moisture associated with frontal depressions. The very large thermal difference between the tropics and extratropics drives the atmosphere and ocean to act in such a way that they propel the warmer fluid poleward and cooler fluid equatorwards. This is, therefore, an expression of the "requirement" that the air and the sea act in a real sense and convectors, transporting heat toward high latitudes within their bodily motion. The warm conveyor belt is closely related to the massive region of cloud within the warm sector and above the warm front. This cloud is the "signature" of huge volumes of tropical maritime air that flow poleward and upward within the

frontal system. Both movements act to cool the air.

2. There is also a cold conveyor belt, which consists of air that actually approaches the warm front from ahead and sinks to move parallel to the front, undercutting the higher warm conveyor belt. Then, it ascends into the occluded front. A third current flows through the middle troposphere overrunning the travelling low as a cold, dry stream of air. Behind the cold front, a huge volume of cool relatively dry polar air streams across the surface. Over the ocean areas that are commonly downstream of air bowing off cold wintertime continents, a great deal of heat and moisture is pumped up into the atmosphere when it flows across the generally warmer sea. Here, the depression is transporting cold, dry air equator-wards, and air that flows toward the equator tends to sink, becoming compressed. As a result, it is warmed by two processes; convection, and compression warming of the air that sinks between the convective clouds. This action is visible as a region of widespread, scattered convective cumulus clouds that rise essentially as bubbles from over the sea. They often produce showers, separated by bright spells, caused by the sinking air.

3. The region between a warm and cold front is known as the warm sector. Quite often, it is characterized by extensive layer cloud that can produce persistently miserable conditions on exposed coasts, but may break up into pleasantly sunny condition to the lee of hills. The relative warmth, dampness and cloudiness of a warm sector are an expression of the air's origin in oceanic regions of much lower latitudes. Precipitation within this sector is generally widespread; many frontal depression exhibit a band of enhanced activity ahead of, and parallel to, the surface cold front. Visibility is often poor to moderate, and hill fog can be a problem in upland areas where the extensive low cloud has a base that is below the tops of hilly areas. The passage of a cold front, usually produces a drop in temperature and dewpoint. This leads to cooler and drier conditions, in terms of absolute humidity or the amount of water vapor in the air. The polar air that streams across the surface behind a cold front generally provides better visibility because it is often unstable turning over in great depth and becoming well mixed. This instability also produces showery weather, with short-lived precipitation falling from deep cumulus clouds. These characteristic are common over middle and high latitude oceans, but not over continental areas like North America. There, cold air that sweeps southward from Canada in the winter does not experience significant surface heating over the cold land surface, and tends not to generate deep convective cloud. In general, as a cold front passes, the wind veers from southwesterly to westerly or northwesterly in the northern hemisphere, in the southern hemisphere, it tends to shift from northwesterly to southwesterly.

## **§22 Precipitation**

A. For precipitation to occur, there must be a means by which cloud droplets or ice crystals can grow larger and heavy enough to fall as drizzle, rain, snow or hail. Clouds with tops warmer than 5°F (-15°C) are composed of cloud droplets of varying size, which collide as they settle. The larger drops fall faster and sweep up smaller drops by a process known as coalescence. The number of raindrops that form within these clouds depends on the liquid water content, the range of droplet sizes, the strength of the updraft within the cloud - which determines the time available for the droplet to grow - and even the electrical charge carried by the droplets. If, by some process, cloud drops grow large enough to attain a fallspeed greater than the ascending air speed, they will fall as rain. A borderline cloud/drizzledrop has a diameter of about 0.02 cm (0.2 mm), while a typical raindrop has a diameter of about 0.7707 in (2 mm); a raindrop of this size falls at up to 21 ft/sec (6.5 m/sec). Drizzle is formed of drops with a diameter of between 0.02 to 0.05 cm (0.2 and 0.5 mm). Drizzle falls from shallow stratus,

within which weak up-currents of some 4 in/sec (20 c/sec) occur, while vigorous tropical cumulus cloud will generate updrafts of many meters a second to produce raindrops of up to 0.2 in (5 mm) in diameter. Even when drops do become large enough to fall out of the cloud, they suffer some evaporation in the subcloud layer, between the cloud-base and the surface. If the air in this layer is dry and the raindrops small, they may completely evaporate on their way down. Sometimes it is possible to observe this evaporation when shaft of rain or snow can be seen falling from clouds. The shaft will narrow toward the ground surface, vanishing above it. Such features are called virgae or fall-streaks.

1. The global pattern of annual precipitation is strongly related to those of pressure and wind. In middle latitudes, widespread (spanning hundreds of kilometers) precipitation is generated by the ascent of warm, moist air over fronts that sweep across the oceans and adjacent continents. Frontal rain and snow move with the frontal depressions that create them. In many of the regions in the middle latitudes these traveling disturbances provide much of the rain and snow. The areas of activity vary seasonally: they tend to shift toward the pole in the summer months. These systems are responsible for a good deal of the precipitation along the extreme western flank of North America from the Gulf of Mexico to the Maritime Provinces of Canada and also across most of Europe including the Mediterranean in the fall and winter. They also affect regions from China and Japan to Kamchatka in Russia, as well as over and to the west of the southern Andes, as well as southeastern South America in the fall and winter to the southern flanks of southern Africa. Australia and New Zealand are affected during their cooler season. These depressions produce widespread precipitation over the middle-latitude oceans as well. During the summer, over middle-latitude continents, strong surface heating leads to significant showery rain. This tends to be shorter-lived and heavier than the frontal types. 20-80 in (500-2,000 mm) of precipitation falls across Europe in a typical year. The largest amounts occur in mountainous regions, especially those that abut the Atlantic Ocean and provide the first landfall for the traveling frontal systems. Broadly similar totals occur across western North America with heavier falls concentrated along the relatively narrow mountainous coastal zone from central California northward. The steep rain/snowfall gradient across this trip reflects the impact these massive coastal ranges have on frontal precipitation and the rain-shadow region to the east, where totals are below 0 in (250 mm). These mountainous regions also face the onslaught of winter depressions and suffer the snowiest conditions.

2. The pattern of dry areas (with less than 20 inches - 500 mm in a year, for example) can be related to a number of causes. At the highest of northern latitudes, low precipitation values are due, in part, to the low temperatures that prevail in those regions, because the amount of water vapor contained in cold air is very small. Even if the atmosphere provides a means of lifting the air to cool it enough for the water vapor to condense into clouds, little rain or snow is produced. The aridity of the middle-latitude continental interiors is partly due to a rain-shadow effect: for example, the high plains of the United States, and the dry region of western Argentina, in the lee of the Andes. Other areas, such as Siberia in Russia, which is east of the Urals and north of the Himalayas, are generally arid because, in winter, the massive anticyclone suppresses any ascent and is very cold. In summer, surface heating will spark off scattered showery precipitation, but the region's remoteness from the sea means that very humid air rarely reaches it. In contrast the interior of the United States is exposed to very large incursions of moist air from the Gulf of Mexico. During the summer, these provide the essential ingredient of the torrential, thundery downpours that can be linked to severe phenomena like large hailstones or even tornadoes. The marked aridity of the Sahara, Arabia and the Thar Desert of northwest India is essentially an expression of the sinking portion of the Hadley cell. The same is true of the Australian and Kalahari Deserts, and indeed the regions of scant rainfall that stretch across the eastern tropical/subtropical oceans. Another group of arid land areas runs down western South America and

Southern Africa These are affected by the presence of cold ocean currents that flow toward the equator along the coasts The Atacama and Namib Deserts are here, because the cold water suppresses any rain-producing ascent but lies under extensive layer cloud just offshore In fact, at Calama in northern Chile, no rainfall at all was reported in a 400-year period up to 1971.

3. With the very high humidity levels within the oceanic tropics, and the intense surface heating there, it is no surprise that the world's rainfall records are held by the region. The largest rainfall total for any 12 month period was recorded in Cherrapunji in the Indian tea-growing region of Assam. It returned an accumulation of 86.2 ft (26.27 m) from August 1860 to July 1861. The same station also holds the wettest month record: 9.6 ft (2.93 m) in July 1861. The largest 24 hour fall comes from the island of Reunion in the western Indian Ocean, where an unbelievable 6.1 ft (1.87 m) was recorded during 15-16 March 1952. Sometimes hurricanes and typhoons are created within the regime of the Trade Winds, producing widespread heavy rain as well as their notoriously dangerous winds. Places where 80-120 in (2,000-3,000 mm) are observed are regions where the ITCZ is active, where mountainous coasts face onshore flow, where hurricanes, typhoons or cyclones run across land areas, and where mountainous islands like Indonesia trigger locally heavy showers. Much of the heavy rainfall that falls across Southeast Asia and West Africa is monsoonal, while some of the large amounts over the Caribbean, Central America, the Phillipines, Vietnam northward to Japan, and Madagascar are produced by intense tropical cyclones. These traveling rotating storms tend to be embedded in the larger-scale northeast and southeast Trades. Often, they are born on the eastern flanks of oceans and make landfall on their western flanks. This annual pattern masks the seasonal migration of the ITCZ, so the heavy rainfall over Southeast Asia occurs during the summer monsoon. Conditions during the winter monsoon are mainly dry.

B. Under normal conditions, water freezes at 32°F (0°C). However, in the atmosphere, where water particles exist as extremely small cloud droplets, this is far from the case. Even at high altitudes within the troposphere, many cloud particles remain liquid in what is termed a supercooled state. Except at very low temperatures, liquid water will not freeze unless minute impurities are present. These are much less likely to occur in the very small droplets that form clouds than in substantial bodies of water where freezing occurs at 32°F(0°C) (Therefore, it is better to define 32°F (0°C) as the melting point of ice). In the atmosphere, only one cloud droplet in a million is frozen at 14°F(-10°C), a couple of hundred or so in a million are frozen at -22°F(-30°C) and only at -40°F(-40°C) and below will they all be ice crystals. Ice crystals that grow from vapor alone take on different characteristic shapes depending on the temperature range within which they are created. As they descend through progressively warmer layers, they become more complex in shape. Similarly complex form changes can occur if they ascend on updrafts into cooler regions of a cloud. The freezing of supercooled water on to ice crystals is a second mechanism of growth. It is known as riming, which is essentially the same process that causes the deposit of rime as a frost. The most effective surface to freeze water upon is an ice crystal, so if supercooled droplets touch one, they freeze instantly. This means that in clouds where both supercooled droplets and ice crystals are present, the crystals grow rapidly. Crystals may grow at varying rates depending on how much supercooled water freezes on to them, and larger ones can capture others as they fall at higher speeds. The icy particles formed in this manner are known as graupel, which fall and fracture when they crash into cloud droplets. Such splinters can grow into new graupel, which may fragment again to produce a chain reaction, forming very large numbers of ice crystals. As these descend, they often stick together to produce snowflakes. In fact, most of the rain in middle and higher latitudes starts life as snow, even in the summertime. Perhaps surprisingly, the heaviest snowfalls do not occur in the coldest air. Deep accumulations anywhere in the world are

associated with moisture-rich air that has usually come across relatively warm seas. This is because the air must be relatively warm in order to contain large amounts of water vapor. In middle and high latitude areas, the most common mechanism for producing substantial snowfalls is the frontal low - across the Rockies, the Andes and the European and New Zealand Alps, for example. Widespread, deep accumulations are often associated with air that streams through a depression's warm sector, although temperatures must be subzero right down to the surface.

2. Sleet is generally defined as snow that is melting as it settles on the surface although in the USA the term is used for very cold raindrops that freeze into small ice pellets if they fall through a fairly deep layer of air just above the surface. Freezing rain occurs when raindrops fall from a higher, above-freezing region of air into a shallow subzero layer at the surface. The rain freezes on impact with all sorts of surfaces. During an ice storm, the accumulations of frozen rain (sometimes termed glaze) are so large that telephone lines come down, tree branches snap off and walking and driving are treacherous. An accumulation of a few cm of ice is fairly common in susceptible regions - over northeastern USA for example. They can reach some 12 in (30 cm) in extreme cases. Hail comprises of large pieces of ice that form within, and fall from, a cumulonimbus cloud. Such deep convective clouds are characterized by strong updrafts and downdrafts. The hailstones grow from graupel (ice crystals), which act as a nucleus, becoming larger due to the accumulation of supercooled water droplets as they are borne upward on the rapidly ascending air. It is not uncommon for golfball-size hail to occur in the United States during the summer. Such hailstones probably will have been up and down through the same cloud a few times - over the course of ten minutes or so - before they acquire sufficient layers of ice to be heavy enough to fall out of the cloud and on to the surface. It is possible to count the number of ice layers in a large hailstone and thus gain an idea of the number of ascents it has made in the water-rich updraft. It may seem paradoxical that we see such cold, icy objects in the warmest season; it's because convective clouds reach their greatest (and coldest) elevations when the surface is most strongly heated (in the summer), and they are most moisture-laden when evaporation rates are highest (also in the summer).

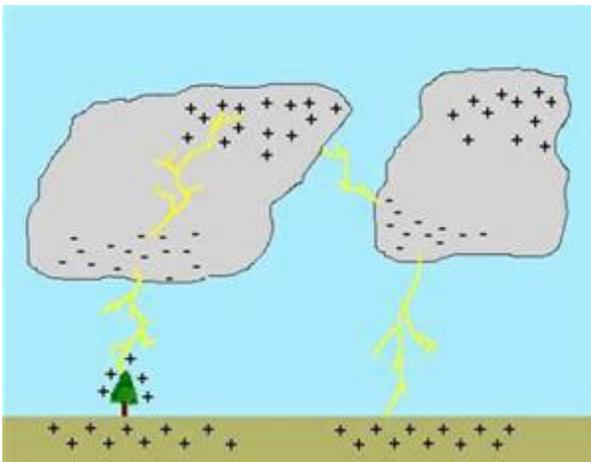
D. Dew forms by the direct condensation of water vapor on to the ground, most noticeably on the grass. Dew will occur under conditions that favor the generation of radiation fog. It is deposited before such fog develops, but is often observed when there is no fog at all. On these occasions, the cooling is sufficient to produce a dewfall, but is not intense enough to affect condensation within the lowest layers of the atmosphere. In regions where precipitation is generally sparse, dew can provide an important source of water for both plants and animals. The most common form of frost is hoar frost it is the equivalent of dew, but the water vapor is deposited as ice crystals in the form of scales, needles, feathers, etc. on blades of grass, bushes and other surfaces. Like dew, hoar frost develops under clear, calm conditions. The temperature to which the air must cool to produce frost is not the dewpoint, but the frost-point. This is defined as the temperature to which the air must be cooled (at fixed pressure) to saturate it with respect to an ice surface, rather than a liquid water surface. A less common form of frost, which often produces dramatic forms, is rime. This occurs when supercooled cloud and fog droplets come into contact with cold surface to form masses of white ice crystals. Rime is most commonly found in upland areas during winter. Sometimes, amazing shapes may be observed because the crystals are deposited while the supercooled cloud or hill fog is in motion. The frost formation grows downstream of the object in which the deposit was first made. Visible frost does not always occur when the air temperature falls below 32°F (0°C). Sometimes the air is so dry that overnight chilling is not intense enough to squeeze any water out of the air as a deposit of frost. Nevertheless, if the surface temperature reaches or falls below 32°F (0°C), ground frost is reported.

1. Fog is defined as a condition where the horizontal visibility is 3,300 ft (1,000 m) or less because of the presence of water droplets suspended in the atmosphere. Thick fog is defined as having visibility of c. 300 ft (100 m) or less. Impaired visibility of more than 3,000 ft (1,000 m) is defined as mist. In land on a cloudless, calm night when the air has low humidity, there will be a large flow of radiation from the Earth surface and atmosphere out into space. If cloud is present, its water vapor, water droplets and ice crystals will absorb some of this outgoing energy and radiate some of it back down to the surface and lower levels of the atmosphere. Therefore, cloud -especially layer cloud -acts like an insulator. If the sky is cloud-free, but the air is humid, the water vapor present will also absorb some of the outgoing radiation and, like a cloud layer, will radiate some of it back to the surface and lower layers, keeping them warmer than they would be otherwise. If however, the air has very low humidity, much of the heat will escape to space, and the surface will be much chillier. Once the Sun is low in the sky and the air begins to cool it does so most strongly at the surface. Thus the chilling tends to be most marked at and near the ground, notably on calm nights. This means that a temperature inversion will form above the surface, in which the temperature increases with height. If the conditions are calm, or near calm, the air adjacent to the surface may cool until it reaches its dewpoint. Light, subtle movements will spread the cooling through the surface layer; any stronger motion - if the wind picks up -will mix the warmer air above and the chilly layer below, destroying the conditions that favor fog formation.

2. Calm, cloud-free conditions can produce radiation fog. The word "radiation" expresses the means by which the air is cooled to its dewpoint temperature - the Earth and the atmosphere lose heat rapidly by radiating it to space. Once the fog develops and grows vertically, the effective radiating surface is no longer the ground, but the top of the fog. The temperature inversion is found at the top, too, often many feet above the ground. Radiation fog is most common when chilling is strongest, during the fall and winter, and it is confined to land areas. Its frequency depends on the distance from the sea and the local lie of the land. Such fog tends to occur more frequently across-low-lying areas, like valleys, into which cool air drains slowly during the hours of darkness. The sea cools only marginally at night - considerably less than the land surface does. In fact, marine cooling is so minimal that it does not lead to radiation fog. Another frequent type of fog is hill fog, which occurs when layer cloud intersects a range of hills, reducing visibility in those portions of the hills within the cloud to half a mile (1 km) or less. Hill fog often occurs in moist warm sectors of frontal depressions, where the cloud base is low.

3. Arctic sea smoke, occurs, occasionally, when cold air spills over much warmer water, the extreme temperature gradient through the air just above the water triggers very localized rapid ascent of bubbles of air, within which the water vapor condenses as narrow plumes. These plume features are known as Arctic sea smoke or steam fog. They can occur over open water in the Arctic and over lakes in middle latitudes in the winter. Cooling of the air can also occur when a warm air mass flows across a colder surface, in which case heat is transferred downward from the air. This can reduce the air temperature to its dewpoint, producing saturation, then advection fog. The critical difference between advection fog and radiation fog is the role played by air movement in its formation. The term "advection" is used almost exclusively in meteorology and oceanography, normally referring to horizontal motion that transports some property of the fluid. For example, "thermal advection" refers to the amount of heat transported by the wind or ocean currents. Advection fog is commonly found in areas of poleward moving tropical maritime air that is cooled by contact with the sea's surface. Thus, it is also known as sea fog. It occurs most often in the spring and early summer, when the sea's surface temperature is at, or recovering from its lowest.

4. Persistently cool areas of ocean witness more frequent advection fog, although it is not very common within the tropics. Among these regions are the Grand Banks, off Newfoundland, where, in July, advection fog occurs on four out of ten day over the cool waters of the Labrador current. It is as common over the cool Oya Shio and Kamchatka waters in the northwest Pacific, and in the Bering Strait. In higher latitudes, sea fog is frequently found over the pack ice and open waters of the summertime Arctic Ocean and Canadian archipelago, and to some extent over the pack ice and open waters around Antarctica. Coastal advection fog often occurs where unusually cold sea water flows parallel to subtropical western continents. Strong cooling of the low-level air leads to fog along the coast of northwest Africa (over the canaries Current) south west Africa (the Benguela Current), Chile (the Humboldt Current) and, perhaps most famously, the central and northern California coast. In the seas around Britain, especially to the southwest from where the tropical maritime air most often approaches, advection fog is also common. On Britain's east coast, too, the cooling of moist onshore flow leads to the development of the "fret" along the Northumbrian coast and "haar" across the coast of eastern Scotland. By definition, advection fog moves. This means that even with winds of 30 knots over the sea, thick fog may still be present. However, with strengthening wind, the fog often lifts to form extensive stratiform cloud. Although advection fog is most common over the sea, it can occur over land when warm, moist air passes across a snow-covered surface or one that has recently been frosty.



E. Lightning is a massive electrical discharge between one cloud and another, from a cloud into the air, or between a cloud and the ground, and thunder is the audible component of the process. These two always go hand in hand. Meteorologists do not agree on the way in which electric charge becomes separated within thunderclouds. The leading theory is that when hail and graupel fall through a layer of supercooled water and ice crystals that form the cloud, there is a transfer of positive charge from the slightly warmer hail to the colder cloud particles. The larger hail becomes negatively charged, accumulating such charge in the lower layers of the cloud. Conversely, the water and ice

crystals gain positive charge and tend to accumulate in the upper reaches of the cloud on the updraft. As the lower negative charge grows with the evolution of the cloud, it induces a region of positive charge below it on the surface, which moves along beneath the drifting cloud. This positive charge tends to be concentrated on objects that protrude from the surface and that are relatively isolated.

1. Although dry air is quite a good electrical insulator, the potential difference that will grow under the right conditions is so enormous that a massive discharge is unavoidable. A difference of about 300,000 volts/ft (1,000,000 volts/m) is typical and will lead to a current of up to 100,000 amperes. Lightning that reaches the ground first develops within the cloud, where electrons move rapidly down toward the base of the cloud, but in a stepped fashion. Every discharge runs for 330 ft (100 m) or so, then halts for about 50 millionths of a second before continuing downward. This process is continued as an invisible stepped "leader" until near the ground, the potential gradient is so large that an upward positive current leaves the surface from tall objects such as trees and buildings. Once these two currents meet, electrons flow down to establish a channel that is used by a larger return stroke. This massive, brilliant

upcurrent is what we see, and it lasts typically for about one ten-thousandths of a second.

2. Only about one in five lightning strokes are from cloud to ground. Each instantly heats the channel of air through which it flows by about 54,000°F (30,000° C). This means that the air expands incredibly quickly and very dramatically to produce a shock wave, which travels away from the lightning stroke at the speed of sound. The light from lightning reaches our eyes instantaneously, but the sound of thunder emanates from it at about 1,000 ft/sec (330 m/sec). This forms the basis for a rule that we can use to estimate our distance from the ground stroke. Count the seconds between the flash and the thunder - every second indicates a distance of about 1,000 ft (330m). therefore, a pause of three seconds means that the lightning is about 0.6 mi (1 km) away. This rule holds good for distances of up to 3 mi (5 km), beyond that, we do not often hear thunder, because the sound is absorbed and refracted by the air.

F. Sometimes when the weather is showery, we see rainbows. These are visible when the Sun shines upon the falling drops - and it must be shining from behind us as we look toward the shower. This means broadly, that in the morning, rainbows will be visible in the west, and in the afternoon, in the east. When sunlight enters a raindrop, some of it passes straight through, while the remainder is reflected back by the rear surface of the drop. The angle at which this occurs is about 42 degrees; as the light enters the raindrop, each ray is refracted slightly differently, as is each ray leaving the drop. When combined with the internal reflection, this double refraction splits the "white" sunlight that shines on to a drop into its component colors, the same way that a prism splits white light into the colors of the spectrum. When this happens within a mass of falling raindrops, we see a rainbow. Refracted red light enters our eyes from higher drops, and violet light from lower drops. As a result, the brilliant rainbow we see is red at its top and violet at its bottom. Occasionally, there may be fainter, but noticeable, secondary rainbow. This forms when sunlight enters the raindrops at such an angle that a double internal reflection occurs. As a result, the light that finally leaves such drops is fainter and the colors weaker.

#### **Art. 4 Arson within the Special Maritime and Territorial Jurisdiction**

##### **§23 Forest and Grassland Fires**

A. Fire 36CFR §261.5 prohibits the following: (a) Carelessly or negligently throwing or placing any ignited substance or other substance that may cause a fire. (b) Firing any tracer bullet or incendiary ammunition. (c) Causing timber, trees, slash, brush or grass to burn except as authorized by permit. (d) Leaving a fire without completely extinguishing it. (e) Causing and failing to maintain control of a fire that is not a prescribed fire that damages the National Forest System. (f) Building, attending, maintaining, or using a campfire without removing all flammable material from around the campfire adequate to prevent its escape. (g) Negligently failing to maintain control of a prescribed fire on Non-National Forest System lands that damages the National Forest System. A moratorium on slashing trees has been effective at protecting the environment in China. Whoever unlawfully cuts, or wantonly injures or destroys any tree growing, standing, or being upon any land of the United States shall be fined under this title or imprisoned not more than one year, or both under 18USC§1853. Whoever, willfully and without authority, sets on fire any timber, underbrush, or grass or other inflammable material upon the public domain...or for the acquisition of which condemnation proceedings have been instituted shall be fined under this title or imprisoned not more than five years, or both under 18USC§1855. Arson within special maritime and territorial jurisdiction occurs when; Whoever, within

the special maritime and territorial jurisdiction of the United States, willfully and maliciously sets fire to or burns any building, structure or vessel, any machinery or building materials or supplies, military or naval stores, munitions of war, or any structural aids or appliances for navigation or shipping, or attempts or conspires to do such an act, shall be imprisoned for not more than 25 years, fined the greater of the fine under this title or the cost of repairing or replacing any property that is damaged or destroyed, or both. If the building be a dwelling or if the life of any person be placed in jeopardy, he shall be fined under this title or imprisoned for any term of years or for life, or both” under 18USC§81.

1. Fire Management Assistance Declarations by the Federal Emergency Management Administration (FEMA) began in 1970 when two were authorized. Prior to 2003 Fire Management Assistance Declarations were called Fire Suppression Authorizations. There were never more than ten authorizations until there were 20 in 1994. Since 1998 there have been more or less than 50 fire management assistance declarations annually with a high of 114 in 2011. In 2016 there were 49. There are of course far more major forest fires than there are fire management declarations and must be regionally consolidated. Most of the past century’s wildfire activity has been seasonal in nature. However, recent years have proven otherwise, and the United States has experienced fire activity in every month of the calendar year. Firefighters are successful in extinguishing 97% of these 100,000 fires and containing them to less than 10 acres in size. No other country comes close to this benchmark of success. Costs average about \$4.7 billion per year for federal, state and local governments for suppression of these wildland fires that escape initial action. In the 1960s the U.S. lost on average about 209 structures per year, each subsequent decade shows growing numbers in this escalating trend and between 2000 to 2010 38,601 structures burned. There are 56,000 wildland firefighters within the federal and state government; this includes all employees utilized for firefighting, even if it is not their primary job. In the Fire Service, there are about 1.1 million structural firefighters, roughly 825,000 volunteer and 275,000-paid career. It is estimated that about 100,000 are involved with wildland firefighting to some degree or another. Between 2001-2012, over 200 on-duty Wildfire Fighter fatalities occurred. That comes to about 20 deaths per 100,000 workers, or 20 deaths per year.

**Major Disaster, Emergency and Fire Management Declarations 1970- 2015**

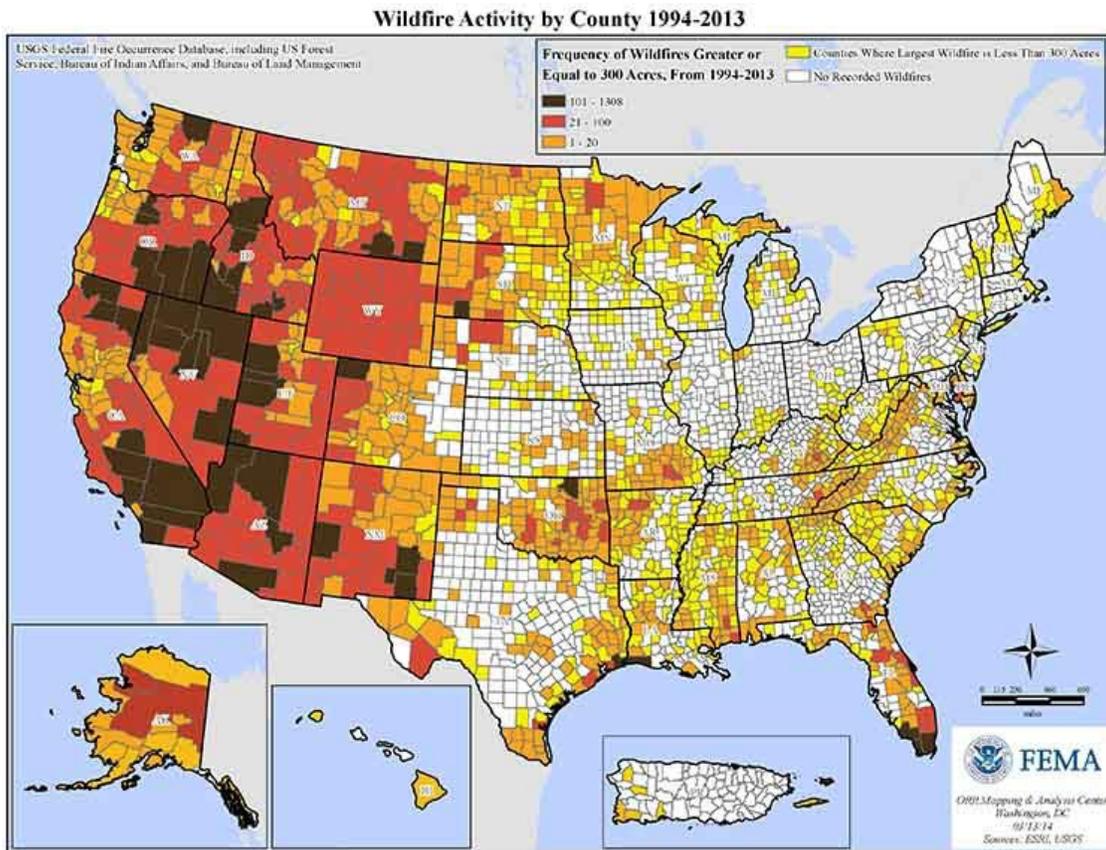
Year	Major Disaster Declarations	Emergency Declarations	Fire Management Assistance Declarations (Prior to 2003: Fire Suppression Authorizations)	Total
2016	45	7	49	101
2015	35	1	27	63
2014	45	6	33	84
2013	62	5	28	95
2012	47	16	49	112
2011	99	29	114	242
2010	81	9	18	108
2009	59	7	49	115

Year	Major Disaster Declarations	Emergency Declarations	Fire Management Assistance Declarations (Prior to 2003: Fire Suppression Authorizations)	Total
2008	75	17	51	143
2007	63	13	60	136
2006	52	5	86	143
2005	48	68	39	155
2004	68	7	43	118
2003	56	19	48	123
2002	49	0	70	119
2001	45	11	44	100
2000	45	6	63	114
1999	50	20	40	110
1998	65	9	54	128
1997	44	0	3	47
1996	75	8	75	158
1995	32	2	4	38
1994	36	1	20	57
1993	32	19	7	58
1992	45	2	6	53
1991	43	0	2	45
1990	38	0	5	43
1989	31	0	1	32
1988	11	0	5	16
1987	23	1	7	31
1986	28	0	1	29
1985	27	0	9	36
1984	34	4	4	42
1983	21	1	2	24
1982	24	3	0	27
1981	15	0	3	18
1980	23	6	2	31
1979	42	10	7	59
1978	25	14	2	41
1977	22	34	5	61

Year	Major Disaster Declarations	Emergency Declarations	Fire Management Assistance Declarations (Prior to 2003: Fire Suppression Authorizations)	Total
1976	30	8	7	45
1975	38	6	1	45
1974	46	5	2	53
1973	46	0	9	55
1972	48	0	0	48
1971	17	0	3	20
1970	17	0	2	19
1953	13	0	0	13

Source: FEMA

2. In 2017 summer fire season, it was estimated that with an average annual wildfire risk of 1.2%, Forest Service land was 60 times more likely to burn than the 0.07% average risk of all National Resource Lands, including National Forests, and 0.02% average annual wildfire risk of national parks and monuments of scientific significance. The abolition of the Forest Service increases the number of acres of public land held by the Interior Department from 341 million acres to 420 million acres. Recently, there has been a surge of extremely destructive fires ever closer to buildings and cities with corresponding social disruptions and substantial economic costs. The Forest Service and affiliated slash and burn forest labor, flea, tic and rabies contractors are due immediate disability retirement under 5USC§8337 and Sec. 223 of the Social Security Act under 42USC§423 to prevent arson within special maritime and territorial jurisdiction under 18USC§81 a crime of both harbor and concealment of terrorists under 18USC§2339 and provision of material support for terrorists under 18USC§2339A.



3. Taking into consideration the local and regional fluctuations of air temperatures in the vicinity of large summer fires and their melting effect on the opposite pole, noted by the Antarctic Conservation Act of 1978, forest fires are through to be the second leading cause of global warming, after hydrocarbon heating pumps. Regionally, forest fires are the absolute leading cause of triple digit heat. Locally the intensity of forest fires that have crowned and spread like wildfire can exceed 1,000 C° or F° with flames of crown fires as high as 300 ft (100 m). Wildfires can be extremely hazardous to life, particularly in Mediterranean climates, if the underbrush is negligently slashed for burning by pyromaniacs, near defenseless populated or urban areas protected against unlawful occupations under the Fourth Geneva Convention of 1949, or inaccessible regions are ignited by iron dust, instead of silver iodide or other cloud seeding of summer storms, intentionally causing lightning, often with the ground support of extensive nails in trees and even obvious golf club in slash pile, intentional permitted arson by lightning. The occurrence of drought can have serious consequences on forest vegetation and drought conditions favor large-scale fires and increase incidence of lightning-caused fires. It has long been held by forestry literature, that there is a distinct increase in wildfires, after commercial logging operations, and more certainly due to negligent backed-up slashing and piling of multiple slash piles, with the intention to burn them, getting closer and closer to buildings and cities as baby boomer total knee replacements, tempers and ability to try the 80% cure rate of dextrose prolotherapy, cave in to unnecessary forestry operations, conflicting pain with curative trails of <5° grade, flammable debris, ignition and *S. pyogenes*. In 2017 the Forest Service was discovered to seed summer storms with electrically conductive dust, probably iron, to create lightning, after fire fighters extinguished their out of control square mile burn and left another square mile in slash piles. Wildfires are started by lightning or accidentally by people, or intentionally by arsons, fired for abuse of immunity to Fire

**Manzanita Thicket Killer: Piled and Chucked**



Source: Forest Service Style Slash Pile. Astronomy Camp Oct. 1, 2017



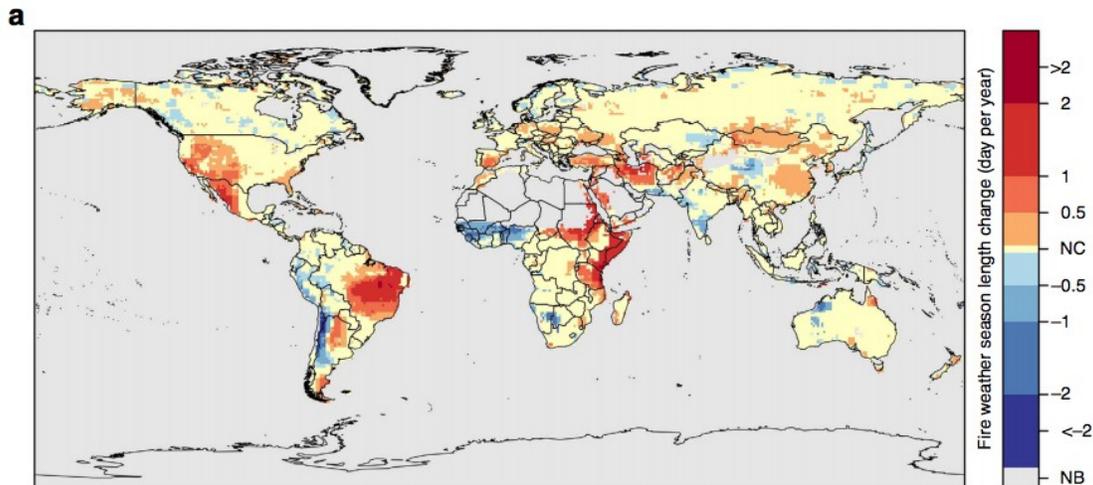
4. The Forest Service evicted wildfire fighters appearing to the Chetco Bar Fire, while the fire was only 14 acres and could have been easily contained, before becoming a disability retirement claim to largest forest service fire in the nation, at nearly 200,000 of 495,000 acres of 1.8 million acre Rogue River Siskiyou National Forest burned. Slash piles are condemned by Parks and Recreation to be chipped roadside and in urban areas and chucked to reduce potential flame height and crowning potential from >8 ft. (3 m) to < 3 feet (1 m). California and all states with Mediterranean climates must be

particularly careful not to slash thickets of the shrubs that grow in those regions. Mediterranean climate shrubbery piles up so thickly, it is not adequate to chuck them. Chucking is usually effective at eliminating additional fire hazard posed by the negligent piling of slash in almost all other slashed forest types. A chipper or responsibly contained and extinguished winter campfire are wanted to eliminate flammable debris wherever Mediterranean climate shrubbery, defined as unlawful cutting and/or piling, occurred, and pyromania must be prevented. Three times more forest was burned in southern Europe during the 2017 fire season than average. Ask not what your national park can do for you under Pub. L. 113–287, §6(e), Dec. 19, 2014, 128 Stat. 3272, codified Title 54, National Park Service and Related Programs, but how much wood, could your county park, chuck and chip, if a wood chuck, could chuck and chip, wood?

B. Backyard burners use controlled fires to manage farmland and pasture and clear natural vegetation for farmland, that must not be emulated on a large scale, involving multiple piles, in forested regions by arsoners, who slash a lot of innocent humans, with the edible trees, shrubs and understory, but rarely set the fires themselves, after once becoming infected with and going untreated with any antibiotic for endocarditis caused by *Streptococcus pyogenes*. Untreated *S. pyogenes* causes a 25% chance of dying from a heart attack within 10 years. The excruciating pain of toxic shock syndrome results when a patient is infected by both *S. pyogenes* and hospital acquired methicillin resistant *Staphylococcus aureus*

(MRSA). Due to antibiotic resistance MRSA can only be treated with doxycycline, the once a day antibiotic, for tissue infections such as bubonic plague, Lyme, and *Staph*, but is usually unsuccessful at curing, if environmental exposure to these deadly bacterial infections, is not effectively cleansed with one cup chlorine bleach or two cups of salt dissolved per five gallons of water. *Staph* heart attacks admitted to hospitals have a 50% chance of dying. Slashing is obviously much healthier than burning, no wonder so many piles are left by white terrorists for the white teenager. Chucking wood is hard work for the knees on treacherous mountain slopes with unhealthy consequences from falls, carpal tunnel of the hands, all cured by trail time stolen by piles. Chipping is an industrial hazard with brakes and 3 in. diameter limitations on their utilization on mountain-slopes.

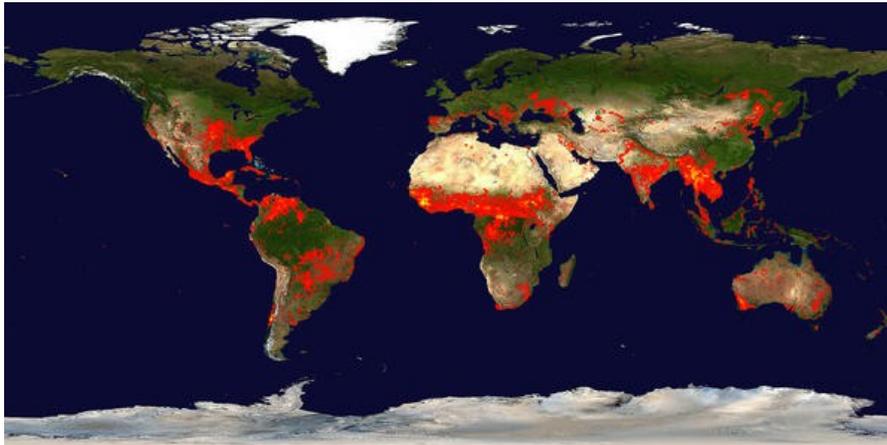
### Wildfire Risk by Fire Season Length Change Over Time



1. There are no annually compiled world statistics on how many acres are burned by wildfires. Fires can generate large amounts of smoke pollution, release greenhouse gases, and unintentionally degrade ecosystems; campfires should be small and contained in the wet season. Global annual burned area estimates approach 350 MHa (869 million acres) per year, and annual pyrogenic CO<sub>2</sub> emissions can exceed 50% of fossil fuel combustion emissions. Global annual burned area estimates approach 350 MHa (869 million acres) per year. The fire maps show the locations of actively burning fires around the world on a monthly basis, based on observations from the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Terra satellite. The colors are based on a count of the number (not size) of fires observed within a 1,000-square-kilometer area. White pixels show the high end of the count — as many as 30 fires in a 1,000-square-kilometer area per day. Orange pixels show as many as 10 fires, while red areas show as few as 1 fire per day. The fire map is not believed to be an accurate depiction of U.S. West Coast fires due to the large size of these fires of tens to hundreds of thousands of acres, the fact that there is only one pixel per fire and custom forbids campfires in affected areas. More work is needed to routinely express global wildfire activity and smoke with satellite imaging; not how many cooking fires. During 1998-2015 a study of satellite data found that burned area declined about 24 percent, with much of the decrease occurring in the world's grasslands and savannas. They found that precipitation had little influence on the long-term decline in global burned area — but human activity, and particularly agriculture, was a strong driver. In some places, particularly tropical forest landscapes, the researchers found that agricultural activity was actually associated with an increase in fires, probably as a result of agricultural waste burning or deforestation to make room for cropland. But these increases were outweighed by the areas where agriculture was associated with a

reduction in burned area, mainly in grassland and savanna landscapes, where there's less biomass available to burn and where fire may be less abused as a land-clearing or management tool.

### Global Wildfires September 2017

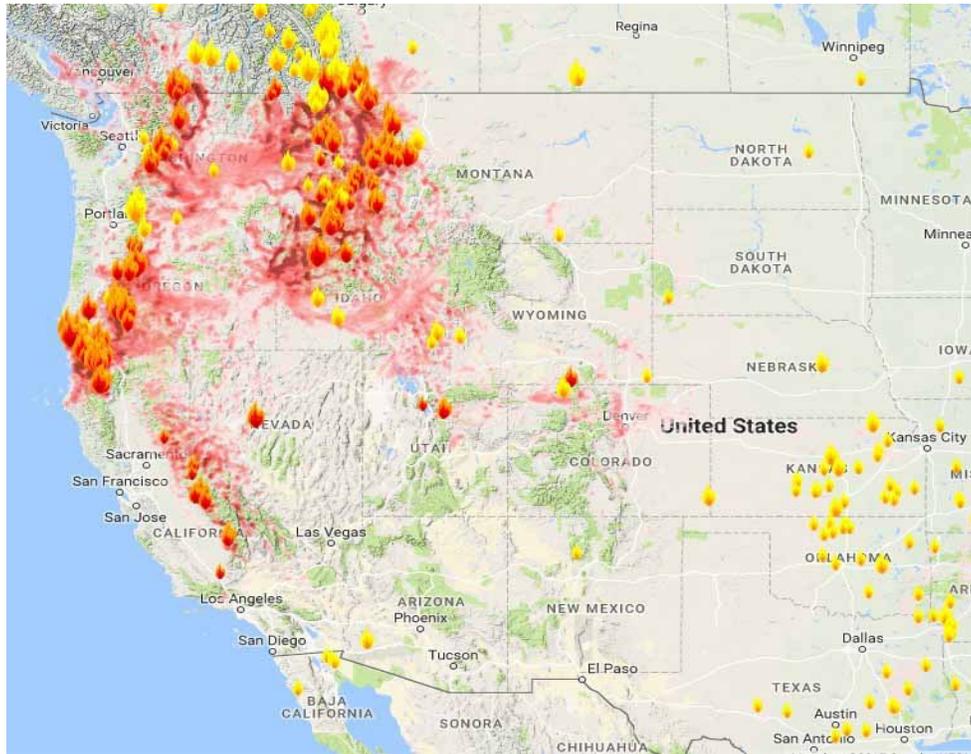


Source: NASA September 2017

2. In developing countries charcoal manufacturing for urban cooking fires, is a significant controlled cause of industrial timber depletion, involving the use of fire. The major error of NASA satellite world forest fire map is that it omits and underestimates wildfires in the Pacific Northwestern United States, Canada, Greenland and Australia, at that time, and overestimating the fires in the southern hemisphere and south east asia where government rainmaking and commercial logging moratorium are thought to be winning the firefight as Cambodia finishes demining. NASA satellite world fire map errors are attributed to depicting the same number of pixels per acre for hypothetical contained industrial charcoal fires and uncontained wildfires that consume many acres and the result of depicting. Although not on the NASA fire map, in 2017 there were forest fires in Greenland. In southern Europe along the Mediterranean, the total area burned is already roughly three times the normal amount of summer wildfires. Back in June, 60 people died over the course of one weekend in Portugal due to wildfires. Thirty people were killed when the fires reached roads on evacuation routes. Those fires don't seem to be abating, in part because of the hotter, drier temperatures, warmer temperatures have extended the regions fire season, potentially making weather like this increasingly the region's new normal.

3. Earlier in spring of 2017, Ireland, an island perhaps most synonymous with dampness battled fires primed, in part, by 75-percent less rainfall. Wildfires are also plaguing Siberia in Russia. Over 1.6 million hectares (3.95 million acres) of Russia are on fire. Back in June, South Africa was ablaze, and in New Zealand in February (during their summer) the city of Christchurch called a state of emergency after a wildfire sent thousands running from their homes and destroyed homes, and killed a pilot. In January, Chile, for whom like New Zealand January is summer, battled a similar unusual number of wildfires due to a combination of drought and high temperatures. ual number of wildfires due to a combination of drought and high temperatures. After some trouble with agricultural fires a few years ago South Asians have led the world to adopt a rainmaking policy to extinguish open burns. Her Majesty Queen Sirikit of Thailand instituted an effective saw moratorium on commercial logging; the return of elephants to newly protected forests was documented in the movie Return to the Forest (2012).

## Fires in the Western United States September 2017



Source: National Interagency Fire Center

C. Over the last decade, annual wildfire cost to US federal lands exceeded \$1.7B US dollars and \$1B US dollars in Canada not including economic losses. In Australia in 2005, total wildfire costs were estimated at nearly \$9.4B US dollars or 1.3% of their Gross Domestic Product. In the United States the Forest Service is reporting that 2017 is shaping up to be a worse than average fire year based on acres of federal, private and state land burned. So far, 5.6 million acres of land has burned this year, or 1.8 million acres more than the ten year average of 3.8 million acres burned by this time. Some states like Nevada are saying that 2017 is the worst fire season in 15 years, while Montana has already used up much of its firefighting budget, even as much of the state remains in drought conditions according to the US Drought Monitor. The state may have to tap into reserve and federal funding, but that isn't the only cost. Brent M. Witham, a 29-year-old firefighter from Mentone, California, was killed cutting down a tree while working on the Lolo Peak Fire. According to the Union of Concerned Scientists (UCS), every state in the western US has experienced an increase in the average annual number of large wildfires over past decades. Extensive studies have found that large forest fires in the western US have been occurring nearly five times more often since the 1970s and 80s. Such fires are burning more than six times the land area as before, and lasting almost five times longer. Wildfire season - meaning seasons with higher wildfire potential - has universally become longer over the past 40 years.

### Fires Contained 2007-2017

2017 (1/1/17 - 9/26/17)	Fires: 49,032	Acres: 8,446,055
2016 (1/1/16 - 9/26/16)	Fires: 44,572	Acres: 4,859,566

2015 (1/1/15 - 9/26/15)	Fires: 48,879	Acres: 9,021,293
2014 (1/1/14 - 9/26/14)	Fires: 40,529	Acres: 3,043,381
2013 (1/1/13 - 9/26/13)	Fires: 38,632	Acres: 4,085,566
2012 (1/1/12 - 9/26/12)	Fires: 47,725	Acres: 8,701,094
2011 (1/1/11 - 9/26/11)	Fires: 59,978	Acres: 7,704,930
2010 (1/1/10 - 9/26/10)	Fires: 49,316	Acres: 2,777,798
2009 (1/1/09 - 9/26/09)	Fires: 70,790	Acres: 5,586,778
2008 (1/1/08 - 9/26/08)	Fires: 67,586	Acres: 4,728,614
2007 (1/1/07 - 9/26/07)	Fires: 71,798	Acres: 8,137,624
<b>Annual average prior 10 years</b>		
2006-2016	Fires: 53,885	Acres: 5,860,611

Source: National Interagency Fire Center 2017

1. Intensive study of historical fires has failed to document any cases wherein fire killed a forest by burning through treetops in the ponderosa pine forests of the American Southwest prior to 1900 there was not the fuel to set timber afire under 18USC§1855. In contrast, numerous fires since 1950 exceeding 5,000 acres (2,025 hectares) have burned forests more intensively than earlier fires. A 1910 article in Sunset Magazine recommended to the fledgling Forest Service that it use the indigenous method of setting “cool fires” in the spring and autumn to keep the forests open, consume accumulated fuel and in so doing protect the forest from catastrophic fire. Ironically, that recommendation came the same year that, in the space of two days fires raced across 3 million acres (1,210,000 hectares) in Idaho and Montana and killed eighty-five firefighters in what is called the “Big Blowup”. It would be ten years after the Big Blowup before many fires in western forests and grasslands were effectively controlled. For decades thereafter, the U.S. Forest Service was dedicated to putting all fires out. By 1926, the objective was to control all fires before they grew to 10 acres in size. A decade later the policy was to stop all fires by 10 am on the second day. In 2000 the nation experienced its most severe fire season in decades when some 8.4 million acres burned in 122,000 fires. In 2001, however, only 3.6 million acres burned - far below the national average for the previous eighty years (about fourteen million acres). The size of the acreage burned in 2000, while unusually large relative to the average acreage burned during the previous decade (3.8 million acres), was less than the average annual acreages burned in the four decades from 1919-1959 (24.4 million acres). Similarly, while the 6.9 million acres that burned in 2002 was substantially above the annual average during the preceding ten years (4.2 million acres), it was not unusual: fire seasons in which acreages similar to the 2002 total also burned had occurred as recently as 1996 (6.7 million acres) and 1988 (7.4 million acres). The number of fires in 2002 was less than the average number of fires occurring in every decade from the 1920s through the 1990s. These averages ranged from a low average rate of 97,599 fires per year from 1899-1929, to a high average rate of 163,329 fires per year from 1980-1989. During the 1990s, fewer acres burned annually on average than during the 1920s-1960s, and again through the 1980s. Nonetheless, with only 248,000 acres of FS land logged in 2003 ten times more is arsoned than logged.

### Un-contained Fires, United States Totals by Agency and State 2017

By Agency	Acres Burned
National Parks	19,556
National Scenic Area	47,320

State	484,137
National Forests	2,232,800
United States	2,783,813
By State	Acres Burned
Alaska	69,814
Arizona	214,334
California	333,386
Colorado	14,428
Idaho	376,185
Montana	753,850
Nevada	82,438
New Mexico	37,331
North Dakota	5,000
Oregon	628,148
South Dakota	7,438
Utah	11,067
Washington	242,599
Wyoming	7,795
United States	2,783,813

Source: National Wildfire Coordination Group 2017

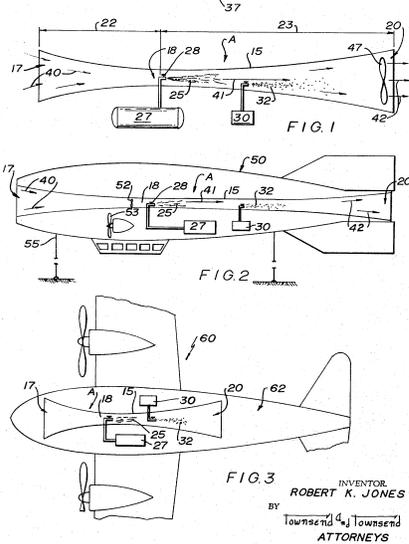
2. In the 2017 fire season 195 forest fires that were not contained within 24 hours burned 2,783,813 acres in the United States. In Montana 753,850 acres burned, 287,295 acres in Lolo National Forest. Oregon burned 628,148 acres, 287,074 acres in Rogue River Siskiyou National Forest. California burned 333,386 acres, 171,798 acres in Klamath National Forest, near the Oregon border. All told 458,869 acres, 25% of 1.8 million acre Rogue-River Siskiyou National Forest burned in 2017. A total of 2,232,800 acres of National Forests were burned in the 2017 fire season. In 2017 the Forest Service burned more than 2.2 million acres, 1.2% of their 183 million acres of National Forests and Grasslands, 0.7% of 314 million acres of National Resource Lands, to cause 80% of total acres burned in the United States. The 334 units of the U.S. national park system, encompass 89 million acres of which 66,876 acres, 0.07% burned. The forty-eight national parks cover about 47 million acres of which 19,556 acres, 0.02% burned. The difference is explained by 47,320 acres burned in Columbia River Gorge National Scenic Area. 484,137 acres were burned on public land held by State forestry, agencies, and field offices. 4,161 acres burned in one un-contained forest fire under county jurisdiction. The hills of Los Angeles were in flames and the smoke was unbearable in Portland. To estimate damages caused by abusive agricultural practices uncut forests cost \$200,000 an acre, parkland with trails and flat stumps for picnicking \$175,000, commercially thinned forests \$150,000, organic irrigated agricultural land \$100,000, burned or organophosphate poisoned land \$50,000.

## §24 Rainmaking

A. Cloud seeding, a form of weather modification, is the attempt to change the amount or type of precipitation that falls from clouds, by dispersing substances into the air that serve as cloud condensation or ice nuclei, which alter the microphysical processes within the cloud. The most common chemicals used for cloud seeding include silver iodide and dry ice (frozen carbon dioxide). The expansion of liquid propane into a gas has also been used and can produce ice crystals at higher temperatures than silver iodide. The use of hygroscopic materials, such as salt, is increasing in popularity because of some promising research results. Seeding of clouds requires that they contain super-cooled liquid water—that is, liquid water colder than zero degrees Celsius. Introduction of a substance such as silver iodide, which has a crystalline structure similar to that of ice, will induce freezing nucleation. Dry ice or propane expansion cools the air to such an extent that ice crystals can nucleate spontaneously from the vapor phase. Seeding of warm-season or tropical cumulonimbus (convective) clouds seeks to exploit the latent heat released by freezing. This strategy of "dynamic" seeding assumes that the additional latent heat adds buoyancy, strengthens updrafts, ensures more low-level convergence, and ultimately causes rapid growth of properly selected clouds. Cloud seeding chemicals may be dispersed by aircraft or by dispersion by anti-aircraft guns or rockets located on the ground. For release by aircraft, silver iodide flares are ignited and dispersed as an aircraft flies through the inflow of a cloud. When released by devices on the ground, the fine particles are carried downwind and upwards by air currents after release. Cloud seeding is under-regulated by local weather modification boards established under state statute. Cloud seeding must be disclosed to the public.

1. Vincent Schaefer (1906–1993) discovered the principle of cloud seeding using dry ice in July 1946. Within the month, Schaefer's colleague, the noted atmospheric scientist Dr. Bernard Vonnegut (brother of novelist Kurt Vonnegut) is credited with discovering another method for "seeding" supercooled cloud water using silver iodide. The first attempt to modify natural clouds in the field through "cloud seeding" began during a flight that began in upstate New York on 13 November 1946. Schaefer was able to cause snow to fall near Mount Greylock in western Massachusetts, after he dumped six pounds of dry ice into the target cloud from a plane after a 60 mile easterly chase from the Schenectady County Airport. From March 1967 until July 1972, the U.S. military's Operation Popeye cloud-seeded silver iodide to extend the monsoon season over North Vietnam, specifically the Ho Chi Minh Trail. The operation resulted in the targeted areas seeing an extension of the monsoon period an average of 30 to 45 days. The 54th Weather Reconnaissance Squadron carried out the operation to "make mud, not war". In 1969 at the Woodstock Festival, various people claimed to have witnessed clouds being seeded by the U.S. military. This was said to be the cause of the rain which lasted throughout most of the festival. An attempt by the United States military to modify hurricanes in the Atlantic basin using cloud seeding in the 1960s was called Project Stormfury was discontinued. The U.S. Bureau of Reclamation of the Department of Interior sponsored several cloud seeding research projects under the umbrella of Project Skywater from 1964 to 1988, and NOAA conducted the Atmospheric Modification Program from 1979 to 1993. The sponsored projects were carried out in several states and two countries (Thailand and Morocco), studying both winter and summer cloud seeding. Reclamation sponsored a small cooperative research program with six Western states called the Weather Damage Modification Program, from 2002–2006.

Feb. 25, 1969  
 R. K. JONES  
 RAINMAKER  
 Filed July 25, 1966  
 3,429,507



2. About 24 countries currently practice weather modification operationally. The largest cloud seeding system in the world is that of the People's Republic of China, which believes that it increases the amount of rain over several increasingly arid regions, including its capital city, Beijing, by firing silver iodide rockets into the sky where rain is desired. There is even political strife caused by neighboring regions which accuse each other of "stealing rain" using cloud seeding. In Australia, CSIRO conducted major trials between 1947 and the early 1960s: in the Snowy Mountains, on the Cape York Peninsula in Queensland, in the New England district of New South Wales, and in the Warragamba catchment area west of Sydney. Only the trial conducted in the Snowy Mountains produced statistically significant rainfall increases over the entire experiment. In Tasmania seeding resulted in increased rainfall by 30% in autumn and seeding has continued ever since. Russian military pilots seeded clouds over Belarus after the Chernobyl disaster to remove radioactive particles from clouds heading toward Moscow. The Russian Airforce tried seeding clouds with bags of cement on June 17, 2008, one of the bags did not

pulverize and went through the roof of a house. In October 2009, the Mayor of Moscow promised a "winter without snow" for the city after revealing efforts by the Russian Air Force to seed the clouds upwind from Moscow throughout the winter. In India, Cloud seeding operations were conducted during the years 2003 and 2004 through U.S. based Weather Modification Inc. in state of Maharashtra. In 2008, there are plans for 12 districts of state of Andhra Pradesh.

B. In Rainmaker US 3429507 A published Feb. 25, 1969 held that artificial cooling by relatively high intensity injection into the large volumes of passing atmosphere creates a substantial temperature reduction below ambient air temperature. A plurality of catalytic condensation inducing particles, such as Dry Ice, silver iodide crystals, electrically charged sand particles and the like, are injected into the passing atmosphere. The United States Forest Service was found to have abused electrically charged metal conducting dust released by missile and/or mountaintop winds, to cause lightning strikes with which to ignite inaccessible steep mountain forests, littered with nails in trees and golf clubs and other metal conductive metal objects strategically placed in slash piles, in the 2017 western summer fire season. Silver iodide was therefore specifically called for in rainmaking preparations and this has offended restrictions on use of human subjects for testing of biological or chemical agents under 50USC§1520a. Weather modification by royal rainmaking technology US 20050056705 A1 published March 17, 2005 and Warm cloud catalyst, preparation method thereof and application thereof CN 104322334 A published February 4, 2015 describe these chemical rainmaking preparations heavily reliant upon airport fog reducing surfactants. Rainmakers are sought to test fire-fighting water cargo airplane or helicopter cloud seeding delivery of frozen H<sub>2</sub>O particles with snow machines. International regional news media jurisdictions must respect the lawful scientific competition to chill ambient air temperature in regions affected by global warming (Harvard arson within forests and oceans under 18USC§81 and) Hail suppression and rain enhancement rocket projectile based on warm cloud catalyst CN106839900 A published by European Patent Office on July 13, 2017.

1. Weather modification by royal rainmaking technology US 20050056705 A1 provides the process of rainmaking and moving cloud using 'Royal Rainmaking Technology' is described for weather modification by means of chemical seeding comprises steps of "Triggering", to activate cloud formation; "Fattening", to promote cloud growth; "Moving", to move cloud to a designated area, and "Attacking" to initiate rainfall from cloud. Attacking can be done by at least 3 different techniques; by 'Sandwich Seeding Technique' for 'warm cloud', by 'Glaciogenic Seeding Technique' for 'cool cloud', or by 'Super Sandwich Seeding Technique' for mixed phase cloud. 'Enhancing' is for enhancing amount of rainfall and prolonging raining duration including increasing area coverage. Weather modification extends to dispersion of cloud into clear flight path, prevention of hail formation, and inducing rainfall from stratiform clouds onto a valley or any catchment area. Seeding may be performed inside or outside a cloud or to the top or underneath of any isolated cloud or cloud band. Experiments have been done by dispersing a hygroscopic substance such as sea salt powder from an airplane to catch the humidity in the air and then followed by a cold substance (for instance, dry ice) to condense the humidity to form cloud. Yet problem exists, without enough dry ice the clouds soon dissolves back to the blue sky right after a cloud is formed. If too much dry ice is used, the cloud becomes 'exploded' and thus also is destroyed; where at this stage even spraying the sea water does not help initiate rainfall as the sky remains blue. In general, sea salt and dry ice are still in use while some other chemicals have been discontinued. Many other formulas have later been introduced in the 'Royal Rainmaking Technology', i.e. urea (moderately cold-formula 4), calcium chloride (warm—formula 6), and calcium carbide (very warm—formula 9). The latter formula 9 has now been discontinued as it is rather dangerous. At the first time when calcium chloride was used in the experiment, the prediction was that after building up a cloud with sea salt (formula 1), had calcium chloride (formula 6) been dispersed into the cloud, the cloud would become bigger and rise to a much higher altitude. When the experiment has been done, the result was a heavy rain of 40 mm.

2. Treatment of atmospheric conditions has long been attempted to increase rain, prevent or suppress hail, and disperse fog. Examples of surfactants useful in practicing the present invention include nonionic surfactants such as alkyl phenyl ether of polyethylene glycol; trimethyl nonyl ether of polyethylene glycol; and alkyl ether of polyalkylene glycols and ionic surfactants such as C I-I CHKC H )C H,CH(SO Na) zm m floz; 4 Q 2 s) zI2 4; 4 9 2 H C H CH(SO.,Na)CH CI-I(CH C H CH(C H )CH SO Na and C I-I CH C(C I-I :CHSO ONa The surfactants can also be incorporated as components of synthetic detergents which include mixtures of surface-active agents with inorganic salts, such as: sodium tripolyphosphates, pryophosphates and sodium sulfates. One commercial synthetic detergent useful in practicing the present invention includes a mixture of sodium tripolyphosphate and sodium lauryl sulfate. RETEN 210, a polyelectrolyte manufactured by Hercules Powder Company and a polyelectrolyte manufactured by Calgon Catalogued as 823-C have been found suitable for practicing the present invention. One example of a commercially available mixture of water-soluble polyelectrolytes and surfactants useful with the present invention is Ultra-Blend 100 manufactured by The Witco Company. A method for increasing rainfall according to the present invention includes passing under a cloud and checking for precipitation. This may be accomplished visually by a pilot or passenger in a plane, and it has been found that a great percentage of clouds have small amounts of precipitation emitted therefrom although there is no indication of precipitation at ground level. The presence of precipitation indicates an unstable or weak point in the cloud; that is, a spot where water droplets are beginning to coalesce. Once precipitation has been detected, the plane makes a pass over the cloud seeding at the unstable spot; that is, the spot where coalescence has commenced as evidenced by precipitation. Either surfactants, water-soluble polyelectrolytes or mixtures thereof are used in

seeding the cloud, and these materials cause coalescence of the water droplets in the cloud which causes the forming of large drops of water which fall to the ground. The instability caused by the seeding of the cloud will spread causing coalescence and thereby rain throughout the entire cloud; however, this effect is enhanced by seeding the entire cloud with the materials. If no unstable point can be detected in the cloud, the cloud should be seeded with the materials in a pattern so as to cover the entire cloud.

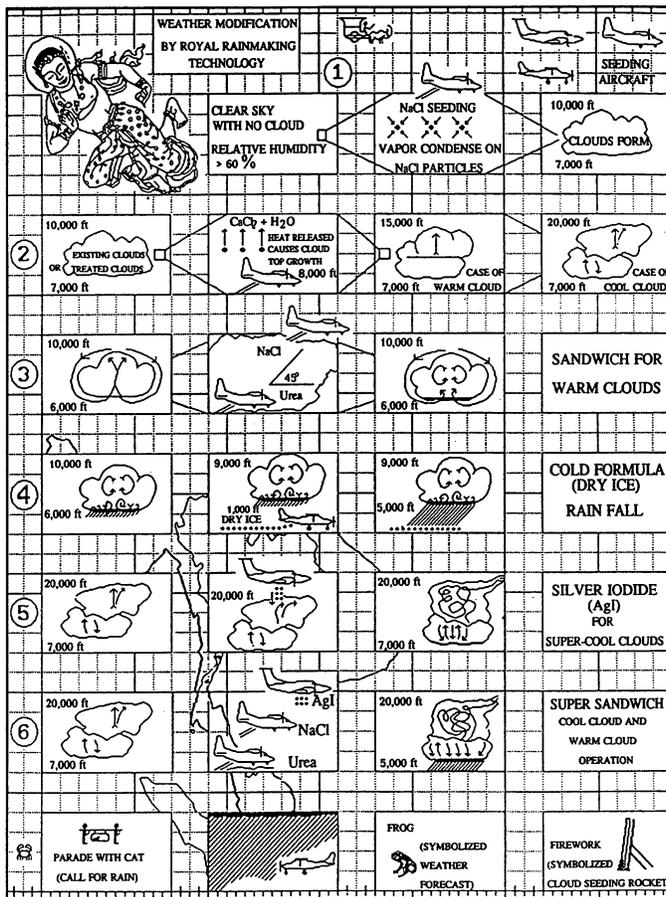
3. Essentially, the same method as explained above may be used with hail suppression; however, the desired end result is not precipitation itself but the effect of stopping the vertical development of a cumulous cloud by causing water droplets therein to fall to the ground due to coalescence caused by either surfactants, polyelectrolytes or mixtures thereof thereby preventing water droplets from traveling in vertical cycles to build up the cloud in layers and preventing hail. Materials according to the present invention may be dispensed into the atmosphere from the ground by the use of a unit called fog-sweep manufactured by the John Bean Division of FMC Corporation. This unit includes a large air fan and a long flexible tube mounted on a trailer and is capable of dispensing liquid and powder materials more than 200 feet into the air. The unit can rotate on the trailer as the trailer is towed through a specified area to provide a good range of operation. Due to the high molecular weight of the water-soluble polyelectrolytes for use in the present invention, it is desirable to dilute liquid polyelectrolytes with water, the proportions not being critical, in order to facilitate dispensing thereof. in liquid form one-half pint to 1 gallon of the materials per mile is sufficient and in powder form the materials may be dispensed in the range of one-half of a pound to pounds per mile with the maximum amount of material usually being determined by an economic factor.

4. In Warm cloud catalyst, preparation method thereof and application thereof CN 104322334 A published February 4, 2015 the warm cloud catalyst comprises the following components in parts by weight: plant powder/plant ash/plant carbon powder 80-120 parts; surfactant dry powder 0.5-5 parts or a surfactant solution 15-32 parts; and a thickening agent 2-10 parts. The catalyst of the present invention to provide such a warm cloud, according to in parts by weight, the raw material component comprising: ash / vegetation carbon powder 80-120 parts, 15-32 parts of surfactant solution; wherein said surface active agent solution, the concentration of solute is 0.5%. Optionally, the ash / vegetation carbon powder particle size 0. 5-120 microns. Optionally, the surfactant solution, the surfactant including the ability to make the surface tension of water decreased by 20% -85% of all surface-active substances. Alternatively, in the surfactant solution, the surfactant includes a fluorine-containing or silicon-containing surfactant. Alternatively, the surfactant solution, the solute comprising: sodium dodecyl benzene sulfonate, alkyl amine salts of high molecular weight copolymers, polyether-modified organosiloxane, polyether-modified dimethyl siloxane, perfluoroalkyl ester solution of one or more; solvents include: water or ethanol. Alternatively, the solution of the surface active agent: 20 mass ratio of the solute to: sodium dodecyl benzene sulfonate and a high molecular weight copolymer of an alkyl amine salt; the solvent is water. Alternatively, the solution of the surface active agent: solute weight ratio of 6: 1 polyether-modified organosiloxane copolymer and a high molecular weight alkyl amine salt; the solvent is water. Optionally, the surfactant solution: solute weight ratio of 15: 4 of the polyether modified polydimethylsiloxane copolymer and a high molecular weight alkyl amine salt; the solvent is water. Chinese use of missiles was tested by India to improve the chance of rain to 60% from 40% for airplane cloud seeding. The Chinese regularly seed clouds with large truck borne missiles in times of drought and Hail suppression and rain enhancement rocket projectile based on warm cloud catalyst CN106839900 (A). Why not seed clouds with clean H2O water cargo firefighting airplane and mountaintop borne snow machine?



C. Cloud making requires better study because clouds are necessary to make rain and there are usually no clouds during the times of drought and forest fire when cloud seeding is justified and airport fog dispersing surfactants seem to have been abused to make rain to clean the air. Contrails left by jet aircraft engines create small clouds in a clear sky. Contrails are condensation trails that happen when hot engine exhaust momentarily condenses ice crystals into pencil-thin vapor trails that quickly vanish like the wave behind a boat, like breath on a cold day. Contrails are formed when hot humid air from the engines mixes

with the colder surrounding air. The rate at which contrails dissipate is entirely dependent on weather conditions and altitude. If the atmosphere is near saturation, the contrail may exist for some time. Conversely, if the atmosphere is dry, the contrail will dissipate quickly. Chemtrails, is a conspiracy theory regarding contrails that linger for hours and will spread out to form large areas of “cloud” cover. Chemtrails have returned positive for aluminum, barium, bacteria, virus, human blood, and molds. Aircraft engines emit water vapor, carbon dioxide (CO<sub>2</sub>), small amounts of nitrogen oxides (NO<sub>x</sub>), hydrocarbons, carbon monoxide, sulfur gases, and soot and metal particles formed by the high-temperature combustion of jet fuel during flight. Weather modification by royal rainmaking technology US 20050056705 A1 published March 17, 2005 describes the process of cloud-making as comprising the steps of ‘Triggering’ which is a technique to activate cloud formation using fine powder of hygroscopic materials such as sodium chloride; ‘Fattening’ which is a technique to encourage or promote cloud growth by dispersing giant nuclei of exothermic-hygroscopic materials such as calcium chloride to cause updraft by exothermic reaction and thereby activate collision and coalescence of the cloud droplets; ‘Moving’ which is a technique to move cloud mass to a designated target area; and ‘Attacking’ which is a technique to initiate rainfall from the cloud.



1. Cloud formation, condensation process and enrichment of newborn clouds is done by upgrading the Cloud Condensation Nuclei (CCN) property and broadening its spectrum in the convective air plumes. Cloud making begins when the sky is clear or only a few cumulus clouds have just formed in the morning and the average relative humidity up to an altitude of 7,000 feet is not less than 60% in the locality. This step is done by dispersing tons of powder of various size spectrum of low critical relative humidity and hygroscopic chemicals, sodium chloride in this case, into the volume of air at or a few thousand feet above the level of cloud formation or convective condensation level (CCL), at a distance upwind of the designated target area and at a time before

natural cloud forming. “Fattening” increases raindrop formation and builds up cloud volume by promoting Collision and Coalescence Process of the cloud droplets (i.e. to cause broadening of cloud droplet spectrum) and increasing in-clouds updraft due to the energy released from the exothermic reaction. This step begins when the cloud tops of the cumulus clouds formed from Step I reach 10,000 feet. This step is done by dispersing tons of powder of a few hundred microns of exothermic-hygroscopic chemicals, calcium chloride ( $\text{CaCl}_2$ ), into the updraft portion of clouds at a level of about 8,000 feet. After seeding, the rate of cloud growth increases due to increasing of the updraft and inducing of moist air into the cloud base. The numbers of big raindrops increase continuously due to active collision and coalescence of cloud droplets. Clouds grow from this step can be classified into two categories depends on the temperature of the cloud top and the rain producing mechanisms. The two categories of clouds are the ‘warm cloud’ and the ‘cool cloud’. In brief, if the top of the cloud reaches above freezing level in the sky (higher than about 18,000 feet), it is defined as ‘cool cloud’, otherwise, it is ‘warm cloud’.

2. The aim of “Moving” is to move cloud from one area to cause rainfall in any designated target area far away. Moving a cloud from a plain area to a neighboring designated target area downwind is done by dispersing exothermic-hygroscopic chemicals, such as calcium chloride from a dense cloud mass formed by “Fattening” located upwind to a target area at a level not less than 1,000 feet above said cloud base. This causes lifting up and the cloud mass starts moving along the wind to a target locality, then the “Sandwich Technique” is applied, while simultaneously super-cool chemical such as dry ice is dispersed at a level about 1,000 feet below the cloud base to enhance rainfall. Causing rainfall can be caused to expand against direction of wind onto a designated target area in an area in need of water, from a dense cloud resting on the windward side of a mountain, in an area in need of water, where a cloud forms but is blown away yet is stuck on the other side of a mountain. To retain such cloud and cause it to fall back as rain onto the locality is possible by fattening cluster of small clouds upwind from the designated target area, to the dense cloud mass to cause merging of growing small cloud masses into the dense cloud mass and attacking the growing small cloud masses using ‘Sandwich Technique’ to initiate rainfall in the locality and thus cause drawing the dense cloud mass to expand back and fall as rain against direction of the wind onto the designated target area.

3. The aim of the third step of rainmaking, is to initiate rainfall from warm clouds by cloud seeding technique called ‘Sandwich Technique’. This is the case for warm cloud seeding. The aim of this technique is to initiate rainfall by promoting the giant raindrops to increase in-cloud loading factor and cooling the cloud base due to endothermic reaction. This step begins when cumulus clouds have formed and move along the wind approaching the target area and the cloud tops reach 10,000 feet or higher but can not grow further to reach the freezing level or about 18,000 feet (i.e. the ‘warm cloud’ type). The sandwich technique is done by dispersing tons of hygroscopic chemicals at two levels, at the cloud top and at the cloud base, at the same time. Powder of the cloud condensation nuclei which is sodium chloride and powder of endothermic-hygroscopic chemicals which is urea in this case are dispersed into the clouds at the top and the base, respectively and simultaneous. The two seeding aircraft fly on the opposite side of the clouds making an angle of 45 degrees to each other. After seeding, the height of the treated cloud base levels down by about 1,000 feet due to the cooling of cloud base temperature and heavy loading of bigger raindrops of the cloud volume. The cloud becomes mature and starts to fall as rain.

4. The aims of the fourth step, 'Enhancing' are to maintain attacking and to enhance rainfall onto the ground, and in addition, to prolong raining duration by cooling the sub-cloud base air mass resulting in

cut off buoyancy, increase the downdraft, increase the relative humidity and reducing the evaporation of the raindrops. This step can be applied after treated clouds move along the wind to cover the target area. Enhancing is done by dropping dry ice flakes at about 1,000 feet below the cloud base. The rainfall rate increases gradually, much greater number of giant raindrops reach the ground, strong downdraft increases and feeds back the moisture into the neighboring cloud bases and causes the continuation of rainfall, resulting rain enhancement in terms of the amount, rain duration and area coverage.

5. A cool cloud seeding aircraft must have the internal pressure control thus capable of operating at an altitude of 30,000 ft. and must be equipped with all the scientific instruments necessary for measuring and recording the meteorological data. The seeding criteria are that when the cumulus clouds move along the wind approaching a target area and the cloud tops grow above the freezing level and reach 20,000 feet. The qualified clouds must have  $0.5 \text{ gm/m}^3$  of super-cool liquid water content or higher and 5 m/sec in updraft or higher at the level of 21,500 feet. Initiating rainfall from cool clouds is done by supplying the artificial ice nuclei into a cool-cloud top to produce rapid glaciation of the super-cool cloud liquid water content (SLWC) in the updraft by freezing the super-cool droplets so they can rime the rest of the cloud water into graupels. Freezing of droplets enhances the release of latent heat, increases cloud buoyancy, increases the updraft, and induces more moist air into the cloud base. Those seeding-induced graupels grow much faster than raindrops of the same mass so that a larger fraction of the cloud water is converted into ice precipitation before falling through the freezing level and finally melt to be raindrops. The cool cloud process is done by ejecting 5 to 15 flares each of 20-gram of silver iodide into the cloud top at the seeding flight altitude of normally about 21,500 feet. Each flares normally burns for about 40 seconds and falls 1 to 1.5 kilometers in the cloud and produces a lot of silver iodide particles to cause freezing of the super-cooled droplets.

6. Attacking Mixed (warm and cool) cloud by cloud seeding technique is called 'Super Sandwich Technique'. The AgI Seeding or so-called Glaciogenic Seeding Technique, preferentially freezes the larger super-cool drops so they can rime the rest of the cloud water into graupel much faster. This faster conversion of cloud water into ice precipitation enhances release of latent heat, thus increases cloud buoyancy, increases the updraft, and induces more moist air into the cloud base. A larger fraction of the cloud water is then converted into ice precipitation before falling through the freezing level and finally melts as rain. Thus, this step is done by combining warm and cool cloud attacking techniques together simultaneously; in this case by dispersing the endothermic-hygroscopic chemicals such as sodium chloride particles at the mid-cloud level (about 10,000 feet), and urea particles at the cloud base level (Sandwich), ejecting 5 to 15 of 20-gram flares of Silver Iodide into the cloud top at the altitude of about 21,500 feet, and dry ice seeding at 1,000 ft below the cloud base of the same treated clouds, simultaneously. The qualified clouds must have  $1.0 \text{ gm/m}^3$  or higher of super-cool liquid water content and 8 m/sec or higher in updraft at the level of 21,500 feet. After seeding by the Super Sandwich Attacking Technique, the treated clouds, in most cases, start to rain right after or shortly after seeding onto the designated target area.

7. The 'Royal Rainmaking Technology can be further applied to prevent hail formation. By applying the 'Super Sandwich Technique' to cause rainfall at a time point before hail starts to form. Such operation can suppress hail formation and alleviate the damage to life or properties and especially the agriculture crops. Furthermore, to provide clear view of the flight path for aviation safety, over-seeding is done by dispersing excess amount of exothermic-hygroscopic chemicals, such as powder of calcium

chloride into a cloud mass. The dense cloud mass will separate into a clear flight path. More work is needed to encourage water condensation and cloud formation with oceanic cooling pumps near the coast and blown in the right direction by winds generated by the high pressure system created by another, parallel row of heating pumps farther out to sea. The best example of this strategy was abused to cause severe winter storms in the Eastern and Midwestern United States in the winter of All clouds are formed by the cooling of moist air down to its dewpoint temperature. Further cooling causes the water vapor to condense gradually out of the air as myriad cloud droplets. The amount of water vapor contained in saturated air depends on the air temperature. Cold air is capable of holding small amounts while very warm air can contain much more. All cloud droplets have a nucleus around which they have condensed - known as the cloud condensation nucleus (CCN). These microscopic particles have a variety of sources, including blowing soil, volcanic eruptions, industry (e.g. smoke) and the spray from breaking waves. Their number varies from ocean to continent, and with height within the troposphere, but a typical value at sea level is around 100-200 million in every 35 cubic feet (or every cubic meter). For precipitation to occur, there must be a means by which cloud droplets or ice crystals can grow larger and heavy enough to fall as drizzle, rain, snow or hail. Clouds with tops warmer than 5°F (-15°C) are composed of cloud droplets of varying size, which collide as they settle. The larger drops fall faster and sweep up smaller drops by a process known as coalescence. The number of raindrops that form within these clouds depends on the liquid water content, the range of droplet sizes, the strength of the updraft within the cloud - which determines the time available for the droplet to grow - and even the electrical charge carried by the droplets. If, by some process, cloud drops grow large enough to attain a fall-speed greater than the ascending air speed, they will fall as rain. A borderline cloud/drizzle-drop has a diameter of about 0.02 cm (0.2 mm), while a typical raindrop has a diameter of about 0.7707 in (2 mm); a raindrop of this size falls at up to 21 ft/sec (6.5 m/sec). Drizzle is formed of drops with a diameter of between 0.02 to 0.05 cm (0.2 and 0.5 mm). Drizzle falls from shallow stratus, within which weak up-currents of some 4 in/sec (20 c/sec) occur, while vigorous tropical cumulus cloud will generate updrafts of many meters a second to produce raindrops of up to 0.2 in (5 mm) in diameter. It is therefore proposed to adapt rainmaking techniques to use mountaintop and fire fighting water cargo airplane and helicopter borne snow machines to seed clouds without the use of any chemicals but artificially frozen H<sub>2</sub>O snow, that would be well received near the target area.

## **§27 Flood**

A. Floods are the most common and costly natural disaster in the United States. Fortunately, property owners who live in 20,300 communities participating in the NFIP can purchase affordable protection to insure against flood losses. Since 1969, the National Flood Insurance Program (NFIP) has paid over \$30 billion dollars in flood insurance claims that have helped hundreds of thousands of families and businesses recover from flood events. The NFIP is self-supporting for the average historical year with claims being financed through collected premiums. Catastrophic losses, primarily from Hurricane Katrina and other storms in 2005 and Superstorm Sandy in 2012 required the NFIP to rely on its borrowing authority from the U.S. Department of the Treasury. In January 2017, the NFIP had to borrow an additional \$1.6 billion to cover losses from 2016, bringing its total debt to almost \$25 billion. Regardless of whether the NFIP is able to repay this debt, its borrowing authority will automatically drop down to \$1.5 billion after Sept. 30, 2017, unless it is reauthorized by Congress, leaving the program, as well as its 5 million policyholders, vulnerable in the event of a major catastrophe.

1. To participate in the NFIP, a community must adopt and enforce floodplain management ordinances

that meet or exceed the minimum requirements of the Program. The specific requirements that a community must adopt depend on the type of flood hazard faced by the community. Flooding has been reported to be the most frequent natural disaster, but may be second to the forest fires, rainmakers are clandestinely attempting to extinguish. Rainmaking efforts are liable for flooding and rain theft. In arid regions that are denuded of vegetation flooding is most severe. Flooding is a natural disturbance to which species have become well adapted. The magnitude of flooding or period of occurrence may be so long, that the event is destructive. Silt deposited by extreme flooding events can adversely affect the understory vegetation. Having already, in temperate climates, drained swamps into waterways, it is necessary that fallen trees are removed from waterways to prevent obstruction from causing a flood event to spill over the banks.

B. In the usually dry arroyos of Northeast Thailand a system of dams was constructed at every turn, primarily to drain waterways and prevent flooding in the rainy season, also in auspicious locations to grow rice and store irrigation and drinking water. Heavy cutting in mountainous areas caused flooding downstream in a province of northern China bordering with Russia. A torrential rain in 1998 that would have been buffered by undisturbed forests quickly exceeded the capacity of rivers, causing widespread flooding of croplands. Millions died that year of famine in a tragedy that was unreported to the western world, triggered by poor forestry and bad agricultural practices. After the devastating floods of 1998, forestry officials in China were demoted from the ministry level to that of an agency, and the People's Republic of China – placed a moratorium on harvesting in natural forest. The confirmed death toll from the Washington landslide was at least 27 people from the Oso, Washington mudslide, that destroyed 31 houses. After more than a week of intensive searching by as many as 500 rescuers and workers, a "significantly" smaller contingent has been tasked with continuing to scour the disaster area, where some debris was piled 60 to 75 feet high. In 1999 the U.S. Army Corps of Engineers warned of the potential for a "large catastrophic failure" in the vicinity of the collapsed hillside, and additional slides in the area were likely. Nobody should be living there. It would be okay to do something like a park, but there should not be houses down there.

1. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Debris flows, sometimes referred to as mudslides, mudflows, lahars, or debris avalanches, are common types of fast-moving landslides. These flows generally occur during periods of intense rainfall or rapid snowmelt. They usually start on steep hillsides as shallow landslides that liquefy and accelerate to speeds that are typically about 10 mph, but can exceed 35 mph. The consistency of debris flows ranges from watery mud to thick, rocky mud that can carry large items such as boulders, trees, and cars. Fast-moving flows of mud and rock, called debris flows or mudslides, are among the most numerous and dangerous types of landslides in the world. They are particularly dangerous to life and property because of their high speeds and the sheer destructive force of their flow. These flows are capable of destroying homes, washing out roads and bridges, sweeping away vehicles, knocking down trees, and obstructing streams and roadways with thick deposits of mud and rocks. Debris flows are typically associated with periods of heavy rainfall or rapid snowmelt and tend to worsen the effects of flooding that often accompanies these events. Finally, in areas that have been logged or burned by forest and brush fires, a lower threshold of precipitation may initiate debris flows.

2. Highly destructive debris flows occur in many areas across the United States. Hilly areas subject to prolonged, intense rainfall are particularly susceptible. Areas throughout southern California are frequently beset by debris-flow problems, and public agencies have expended vast resources on

massive debris-protection systems for more than 65 years. The San Francisco Bay region also has experienced damaging debris-flow episodes throughout this century. El Niño, the ocean-warming phenomenon that can produce heavier-than-usual rainfall in certain areas of the United States, was associated with countless debris flows in Utah, when El Niño's increased rainfall effects were felt during the early 1980's. Hilly areas of Hawaii experience much destruction from debris flows, as do areas of extreme northern California, Idaho, Oregon, and Washington. The mountains of Colorado and the Sierra Nevada of California have also experienced debris flows in areas receiving high rates of rainfall, rapid snowmelt, or a combination of these. Debris flows are not limited to areas of the Western United States. Many debrisflow disasters have also occurred in hilly and mountainous regions of the Central and Eastern United States, particularly in the Appalachian Mountains. Thousands of debris flows in several eastern States were caused by heavy rainfall from hurricane Camille as it moved inland from the Atlantic Ocean in 1969. During an intense storm on June 27, 1995 in Madison County, Virginia, 30 inches of rain fell in 16 hours. Hundreds of debris flows occurred in the mountainous areas of the county amid widespread flooding. The combined flood and debris-flow devastation prompted a Federal disaster declaration for the county.

3. Debris flows start on steep slopes—slopes steep enough to make walking difficult. Once started, however, debris flows can travel even over gently sloping ground. The most hazardous areas are canyon bottoms, stream channels, areas near the outlets of canyons, and slopes excavated for buildings and roads. Wildfires can also lead to destructive debris-flow activity. In July 1994, a severe wildfire swept Storm King Mountain west of Glenwood Springs, Colorado, denuding the slopes of vegetation. Heavy rains on the mountain in September resulted in numerous debris flows, one of which blocked Interstate 70 and threatened to dam the Colorado River. Among the most destructive types of debris flows are those that accompany volcanic eruptions. A spectacular example in the United States was a massive debris flow resulting from the 1980 eruptions of Mount St. Helens, Washington. Areas near the bases of many volcanoes in the Cascade Mountain Range of California, Oregon, and Washington are at risk from the same types of flows during future volcanic eruptions. In areas with vulnerable populations, such as the valleys near Mt. Rainier in Washington, scientists are producing hazard maps that delineate debris-flow dangers. Buildings should be located away from steep slopes, streams and rivers, intermittent-stream channels, and the mouths of mountain channels.

## **§26 Global Warming**

A. Annual economic losses from weather-related disasters, worldwide in 1980 were \$2.8 billion, annual average 1980-1984 \$6.5 billion, 1985 \$7.2 billion, annual average 1985-1989 \$9.2 billion, 1990 \$18 billion, annual average 1990-1994 \$27.6 billion, 1995 \$40.3 billion, 1995-1999 \$58.5 billion, 1999 \$67.1 billion. Forest fires are a primary cause of global warming locally, regionally and on winter poles during opposite summer fire seasons, recognized by the Antarctic Conservation Act of 1978 16USC§2403. The primary driver of human causes global warming for the past forty years, is believed, on the rational basis of published periodic NOAA Sea Surface Temperature (SST) maps, to be submersible Styrene heating pump railcars. Styrene railcars are believed to be currently thermally polluting the Atlantic East coast even more than North Korea's recent ballistic missile tests in the East Pacific. An Oregon recycling shipment to China was terminated in 2017, due to the labor cost of higher sorting standards, with suspicion regarding the Basel Convention on the Control of Transboundary Movement of Hazardous Waste and Their Disposal under the Law of the Sea and through the straits of Japan. Winter rainy season monsoon mitigating, but tropical hurricane intensifying, oceanic warming in the East Pacific and North Atlantic threaten to pollute 40°N equally

with the narrow heating belt that nearly circumnavigates 40° S. The waters between New Zealand and Australia are unlawfully warm December 2017, after successfully chilling the Coral Sea and ceasing thermal pollution of the Indian Ocean, the thermal pollution source must be extinguished. Oceanic heating pumps generate high pressure areas that blow hot dry winds to cooler, lower pressure areas. Long term use of heating pumps causes drought, which cause forest fires, tropical storms, and global warming in violation of the Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques (ENMOD) of 1978.

1. Because of its harmful and long abused effects, lawful use of oceanic heating pumps, is far more restricted than oceanic cooling pumps that likewise require a "turn off when not in use mitigating global warming" appended to Mitigating global warming by otec-induced ocean upwelling WO 2016160735 A1 published October 6, 2016. Oceanic heating pump use is very limited to creating high pressure winds that blow in the direction of cool clouds producing low pressure system, and the Russo-Svalbardian maritime practice of melting the Arctic ice that questions the icebreaker standards by the Polar Code of January 1, 2017. Styrene UN2055 railcar heating pumps have been distinguished from other fuels, that might be used in oceanic heating pumps that must be turned off within one hour that they cease to lawfully control the weather, under Art. 1 and extinguished styrene heating pumps from circulation in the north atlantic by magnet and cable to oil tanker or warship under Art. 5 of the Hague Convention VIII Relative to the Laying of Automatic Submarine Contract Mines because after the TBC wears out in 3 months the railcars self-ignite, if they were not remotely ignited, and whereas thousands of Americans have died because of man-made global warming weather conditions, presumeably caused by the clandestine use of said submersible styrene railcar heating pumps and other oceanic heating pumps that require chemical intervention to prevent self-ignition, are distinguished from more stable fuels as a war crime under 18USC§2441(c)(4) of a person in relation to an armed conflict and contrary to Protocol (II) on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices as amended at Geneva on 3 May 1996 as styrene railcar oceanic heating pumps apply to the termination of unlawful occupation at sea under the Fourth Geneva Convention on the Protection of the Civilian Population and the Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques (ENMOD) of 1978. To extinguish global warming theories it is necessary to articulate arson within the special maritime and territorial jurisdiction under 18USC§81. By posing such a high bar for the common crime of arson, Congress has defended Forest Service arson, at sea, since the Big Blowout Fire of 1910 that is creeping closer and closer to cities and buildings. Congress is advised to repeal the 'special maritime and territorial jurisdiction' from the caption of the section and first clause, and append it to the end of the first sentence with reference to 18USC§7 as indicated in parenthesis:

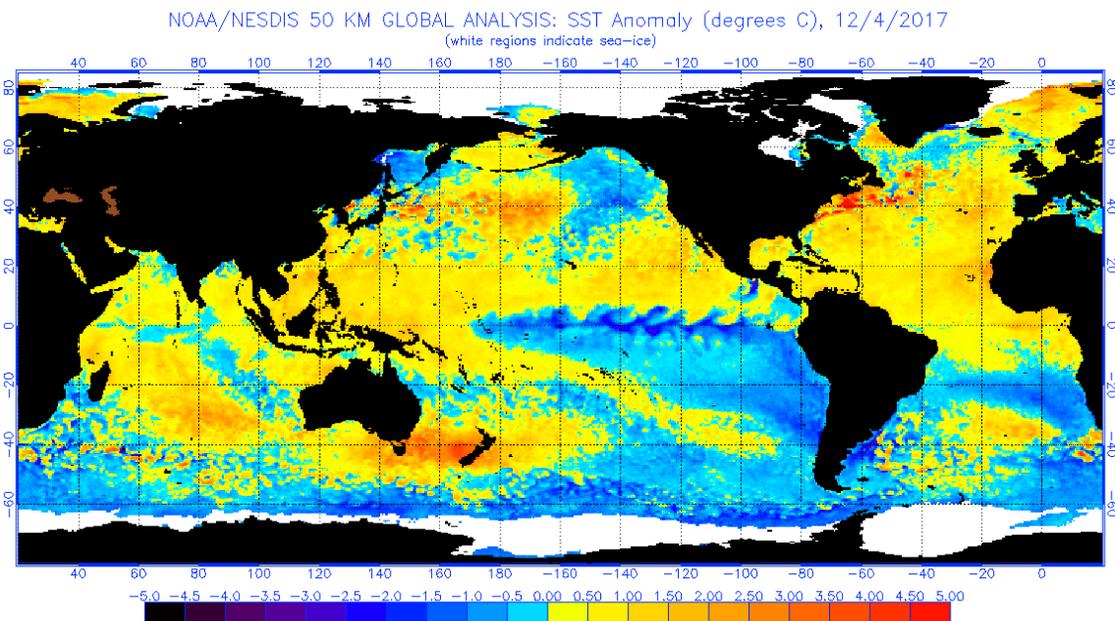
2. §81. Arson (within special maritime and territorial jurisdiction)

Whoever, (within the special maritime and territorial jurisdiction of the United States,) willfully and maliciously sets fire to or burns any building, structure or vessel, any machinery or building materials or supplies, military or naval stores, munitions of war, or any structural aids or appliances for navigation or shipping, or attempts or conspires to do such an act, shall be imprisoned for not more than 25 years, fined the greater of the fine under this title or the cost of repairing or replacing any property (, within special maritime and territorial jurisdiction under section 7 of this title), that is damaged or destroyed, or both.

If the building be a dwelling or if the life of any person be placed in jeopardy, he shall be fined under

this title or imprisoned for any term of years or for life, or both. (June 25, 1948, ch. 645, 62 Stat. 688 ; Pub. L. 103-322, title XXXIII, §330016(1)(H), (K), Sept. 13, 1994, 108 Stat. 2147 ; Pub. L. 104-132, title VII, §708(b), Apr. 24, 1996, 110 Stat. 1296 ; Pub. L. 107-56, title VIII, §§810(a), 811(a), Oct. 26, 2001, 115 Stat. 380 , 381.)

3. Since the Industrial Revolution brought an end to the Little Ice Age (1200-1700 A.D.) it has become necessary to identify the causes of global warming. Cities, war and agriculture were all invented at about the same time in the beginning of the Holocene Era 9,700 B.C. - present. The food forests were badly burned, and typically no longer provide enough food for any number of humans. Livestock was slaughtered to feed starving invading armies. Fast agricultural food, that produces enough vegetable matter, in only one season, was callously invented and marketed by cities. Skeletal records indicates that since the concurrent inventions of agriculture, cities and war humans became shorter before empires arose to secure trade routes and livestock. As a rule, city corporations (watersheds) must not be permitted to slash and burn the forest or go to sea because, they tend to commit genocide (arson) when out of their civil and political jurisdiction. There is county, state, national and international jurisdiction for all rural (park) land and navigable water under 54USC§302904.



B. The December 2017 global weather report is that artificially warming the north atlantic Gulf Stream from the Potomac to Nova Scotia causes international cold water upwelling defenses to remain on in the winter to mitigate drought and potential winter forest fires, in the Great Plains, and is obviously a previously undetected intensifier of the north Pacific source of the curly east to west Santa Anna winds of southern California and low ski resort revenues nation-wide. The heating pumps off the east coast of the United States and Nova Scotia need to be extinguished so that they can be removed under the Hague Convention VIII Relative to the Laying of Automatic Submarine Contract Mines. The Australian Coral Sea, Florida and the Bahamas, are thought to be protecting coral polyps from bleaching hot water temperatures with Methods and apparatus for reducing the intensity of hurricanes at sea by deep water upwelling are described in US 20090272817 A1. Although the warm waters on the East Coast might moderate winter weather conditions in the Philippines, a volcano is erupting in Indonesia and ski resort revenues are lower than they would be if subversive heat storage language had

not introduced into by the cold water upwelling Methods of and Means for Weather Modification US Patent 4470544 A granted to Geophysical Engineering Co. on September 11, 1984.



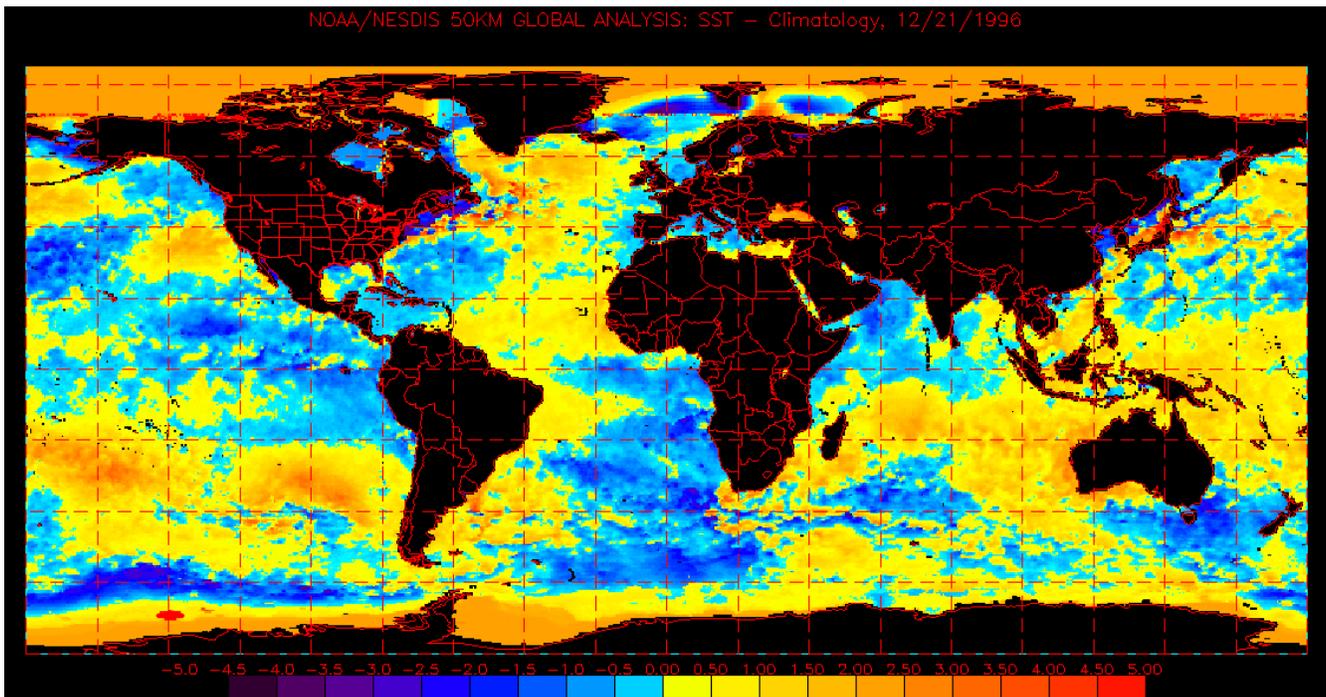
1. Mitigating global warming by (ocean thermal energy conversion) otec-induced ocean upwelling WO 2016160735 A1 was published October 6, 2016. OTEC cool water upwelling ships with AS Trust Holding hydrocarbon refrigeration modifications for enhanced control of cloud making, with non-toxic salt or fresh water snow machine cloud seeding of clouds to precipitate the city Ventura in Los Angeles County, might only make the winds fueling the fires stronger, creating a new low pressure zone and east to west breeze towards the forest fire. What is believed to be a Canadian OTEC cold water upwelling system off the west coast of British Columbia, acting under auspice of successful forest fire extinguishment and normalization of Hudson Bay water temperature, must be turned off to reduce the intensity of the Santa Anna winds, under the Hague Convention VIII Relative to the Laying of Automatic Submarine Contract Mines and Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques (ENMOD) of 1978. After fire season 2017 Santa Anna winds have continued to cause city destroying

wildfires in Northern California and now within 65 miles of Los Angeles due to 60-70 m/p/h winds and probably extensive chapparel slash piled on mountain slopes that are inaccessible to firefighters. Electrical and ammonia revenues from otec-induced ocean upwelling challenge Canada and Chile to a "turn off cold water upwelling when not in use mitigating global warming" clause. This clause is needed for a (fleet) of cold water upwelling ship(s) to be granted one quick pass for news meteorology, with radiation insurance through the East Pacific to the straights of Japan and then between New Zealand and Australia for the rest of the southern summer.

B. Roughly forty years ago, a small group of scientists and policy makers began to realize that humanity was on a dramatic collision course, as the rapidly growing world economy and population threatened to collide with the planet's finite resources and fragile ecosystems. The danger was first highlighted globally at the 1972 UN Conference on the Human Environment in Stockholm. What was not clearly appreciated back in 1972 was that the real limits were not the minerals, but rather the functioning of the Earth's ecosystems, the biodiversity, and the ability of the atmosphere to absorb greenhouse gases (GHGs) emitted by humanity from fossil fuels and other agricultural and industrial processes. Climate change is a global crisis. The hot air about climate change seems to come from the fact that the United States is party to the UN Framework Convention on Climate Change (UNFCCC) signed at the Rio Earth Summit in 1992, but not to the Convention on Biological Diversity, nor its aptly named Biosafety and Liability Protocols or the Law of the Sea, and this damages the English language of arsons.

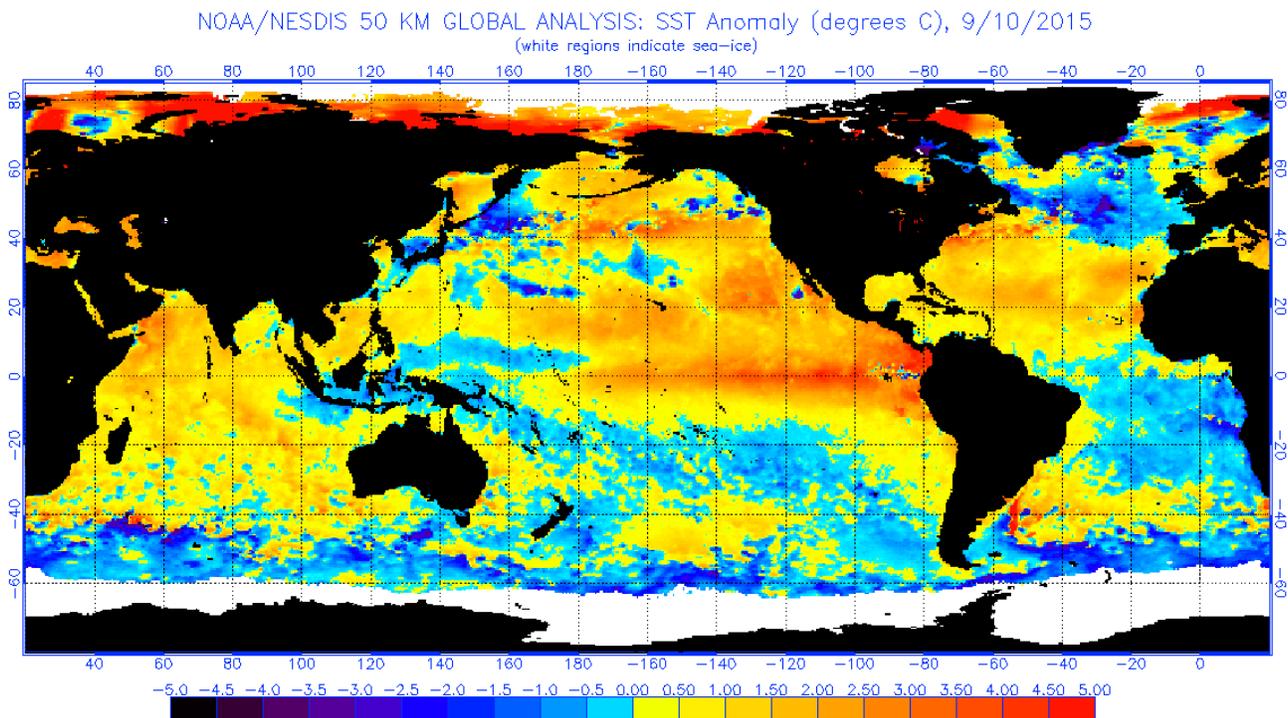
1. 2013 was the 37th consecutive year of above average global temperatures. Using official data provided by the National Climatic Data Center (NCDC), combined land and ocean temperatures for the earth in 2013 averaged 0.62°C (1.11°F) above the long-term mean, making 2013 the fourth warmest

year ever recorded since official data on global temperatures began being kept back in 1880. The year 2010 remains the warmest on record, when the combined land/ocean global temperature was nearly 0.66°C (1.19°F) above NCDC's 20th century average (1901-2000). The last below-average year for the globe occurred in 1976, when global temperatures registered 0.08°C (0.14°F) under the long-term average. The models of the Intergovernmental Panel on Climate Change (IPCC) have predicted a continuous rise in Earth's temperature as CO<sub>2</sub> levels increase, while, in fact, global temperatures have been falling since 2001. Thermal and polar vessel de-icer pollution must be recognized as forms of pollution for the purposes of the Federal Water Pollution Control Act of 1972 and 1982 Law of the Sea. In the last 35 years of the twentieth century the Arctic Ocean ice thinned by 40 percent. In 2000, the polar ice at the top of the world melted for the first time in human memory. Many scientists believe there had not been so much open water in the polar region in 50 million years. Other scientists predicted that summer ice in the Arctic Ocean could disappear entirely by 2035. In 2000 it was announced that of the 25 hottest years that had occurred since Earth temperature record keeping began in 1866, 23 of them had occurred after 1975. Every one of the past 40 years has been warmer than the 20th century average. 2014, 2015 and 2016 were the hottest years on record, 2017 second. The 13 warmest years on record have all occurred since 1998 despite improved NOAA Sea Surface temperature SST anomaly map records beginning in 1996.



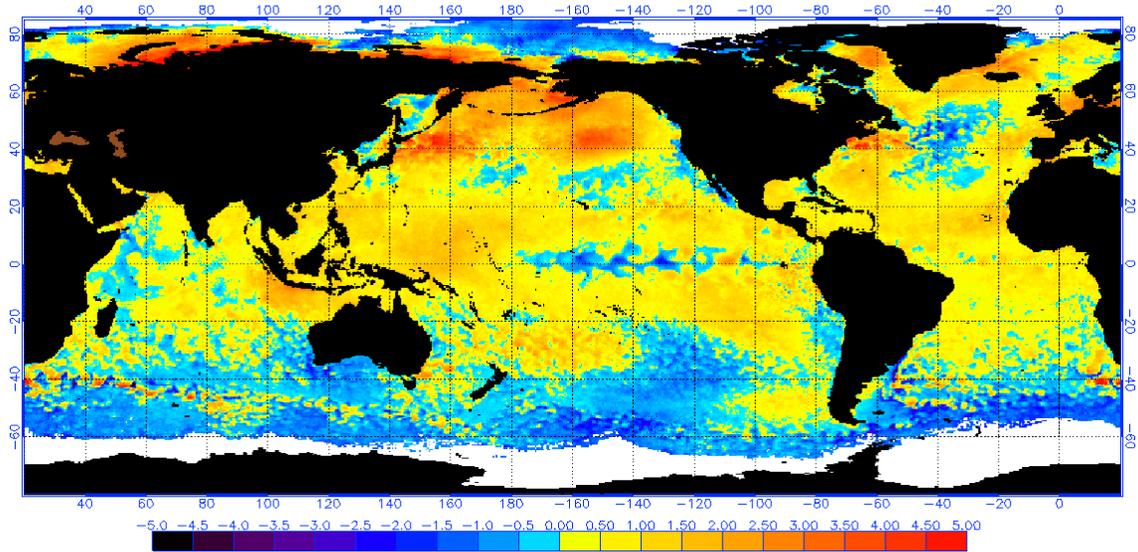
2. The most direct manifestation of human-induced climate change has been the rise in temperatures. For many locations 2014 and 2015 were the hottest in history. Every one of the past 40 years has been warmer than the 20th century average. 2014, 2015 and 2016 were the hottest years on record. The 12 warmest years on record have all occurred since 1998. Globally, the average surface temperature has increased more than one degree Fahrenheit since the late 1800s. Most of that increase has occurred over just the past three decades. The global seas have risen an average of 7 to 8 inches (17.8 to 20.3 centimeters) since 1900, with nearly half of that (3 inches, or 7.6 cm) occurring since 1993. Annual average temperatures over the contiguous United States increased by 1.8 degrees Fahrenheit (1 degree Celsius) between 1901 and 2016. And over the next few decades, scientists predict those temperatures

will rise by about 2.5 degrees F (1.3 degrees C) relative to the period of 1976 to 2005. In office, Trump said that the U.S. would withdraw from the Paris Climate Accord, an international agreement that aims to limit global warming to below 3.6 degrees F (2 degrees C) above preindustrial temperatures.



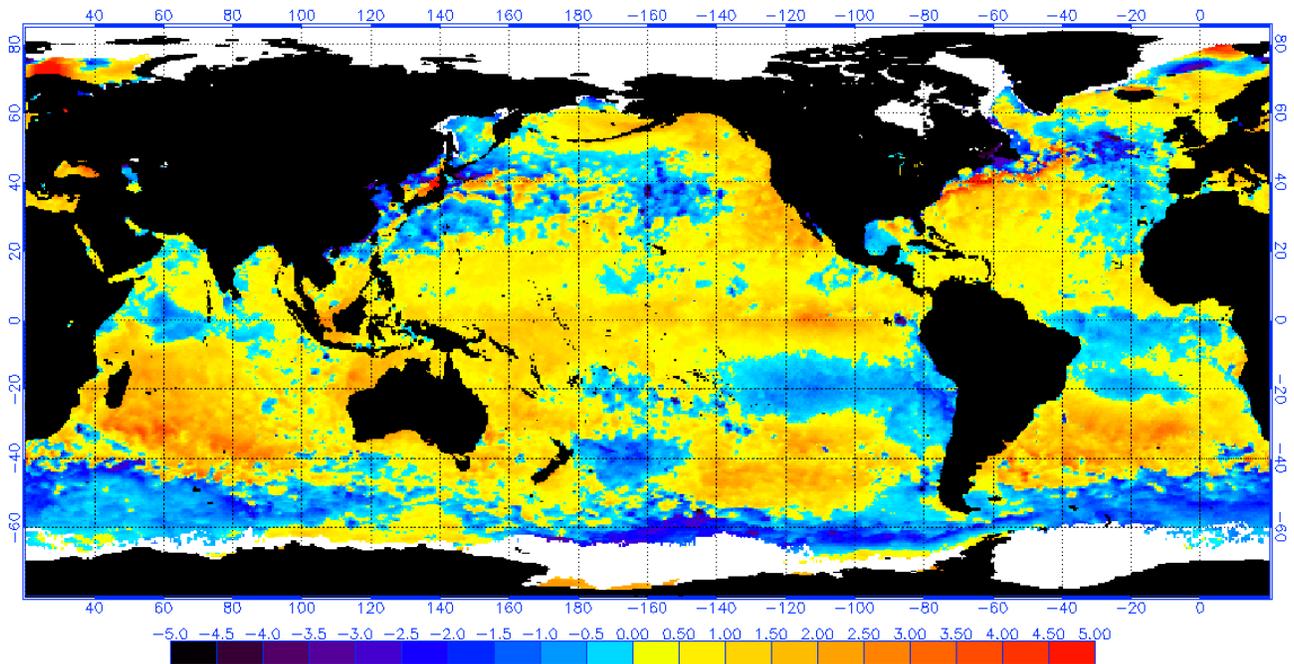
3. In a world map prepared by NASA satellites and the National Oceanic and Atmospheric Administration (NOAA) one can see that the average temperature in 2013 in each location on Earth compared with the average temperature of the location during 1951-1980. There are spots in the northern hemisphere that are 5°C hotter and spots in the southern hemisphere have gone from 2.5°C cooler to 4°C cooler since widespread use of hydrocarbon cooling pump technology by Japan and Hawaii in the Pacific and Canada and Western Europe in the North Atlantic. 2015 may have been the hottest year on record in the Americas, both North and South, and to a lesser extent Africa and South East Asia, but does not seem to be badly affecting Europe or East-Asia and the Antarctic is getting colder than ever, 4°C cooler, nearly as cool as the 5° C warming in the Arctic. The melting of the Arctic ice has been making Antarctica slightly colder, and now heating pumps compete with cooling pump technology even in the Arctic, and Antarctica is 2°C cooler than the previous year. The red spots on the world map indicate occurrences of extreme heat waves. Extreme heat waves have occurred in the Arctic ocean and southward through the middle of Russia. Extreme heat events that only occurred or two times per 1,000 days in the 1950s are now occurring at a frequency of 50-100 times per 1,000 days' time. There is a persistent oceanic warming, as persistent and nearly as anomalously hot as the Arctic Ocean, to the southwest of Alaska that is suspected of causing the Santa Anna winds that are drying out California. Another, more recent warming event has become a semi-permanent part of the Columbian civil war that extends westward more than halfway across the Pacific along the equator and north to waters as far north as Baja California. Since the extraordinary wet on the west coast winter of 2016, when drought stricken California recouped its aquifers, Chile seems to have successfully neutralized the artificial warming from Columbia with some sort of cold water upwelling system that should probably be turned off when not in use.

NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 9/12/2016  
(white regions indicate sea-ice)

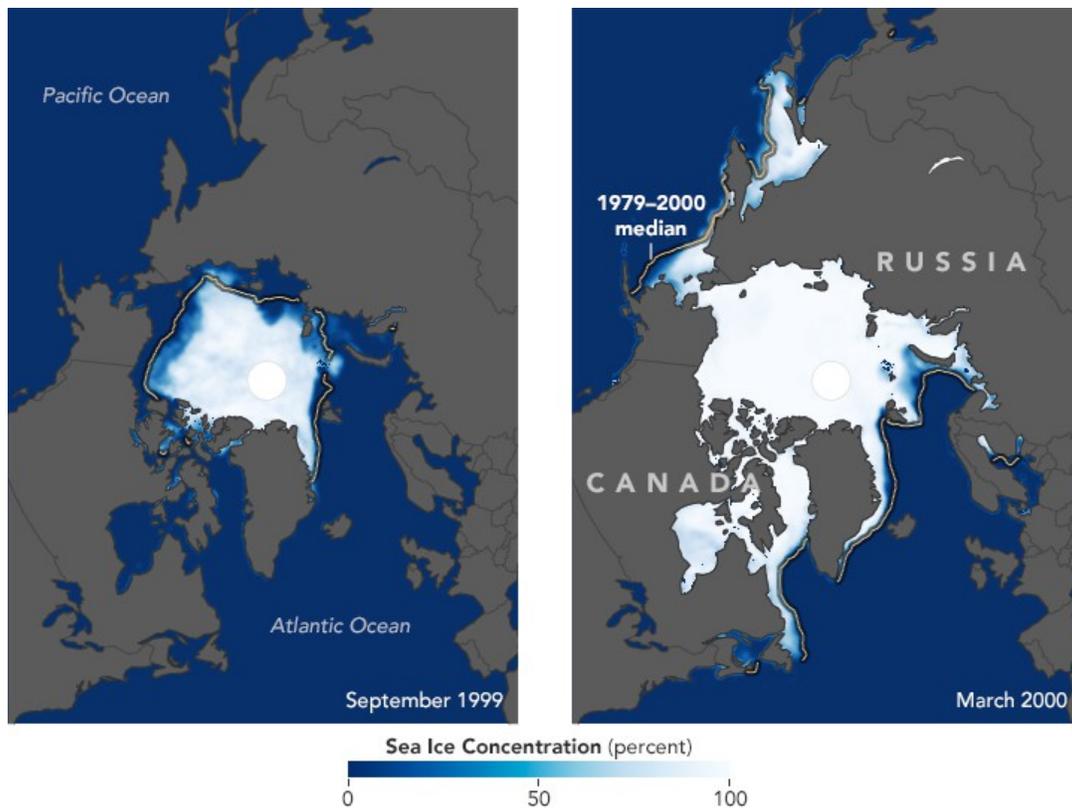


4. The New York City coast was extraordinarily warm during the climate change protest oriented World Summit 2014. The extremely snowy eastern winter of 2014 can be explained by a coastal cool belt and oceanic warm belt along the entire eastern seaboard. Ocean warming can have severe impacts in places where overfishing already has placed marine populations under stress. The Gulf of Maine is warming particularly quickly – faster than almost any other ocean waters. This rapid change, equivalent to about  $0.55^{\circ}\text{C}$  every two years over the past decade, is upending both marine ecosystems and the human communities that rely on them. The IPCC projects that a  $2^{\circ}\text{C}$  increase in global temperature by 2050 would result in annual losses of \$17-\$41 billion from commercial fisheries.

NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 12/29/2014  
(white regions indicate sea-ice)



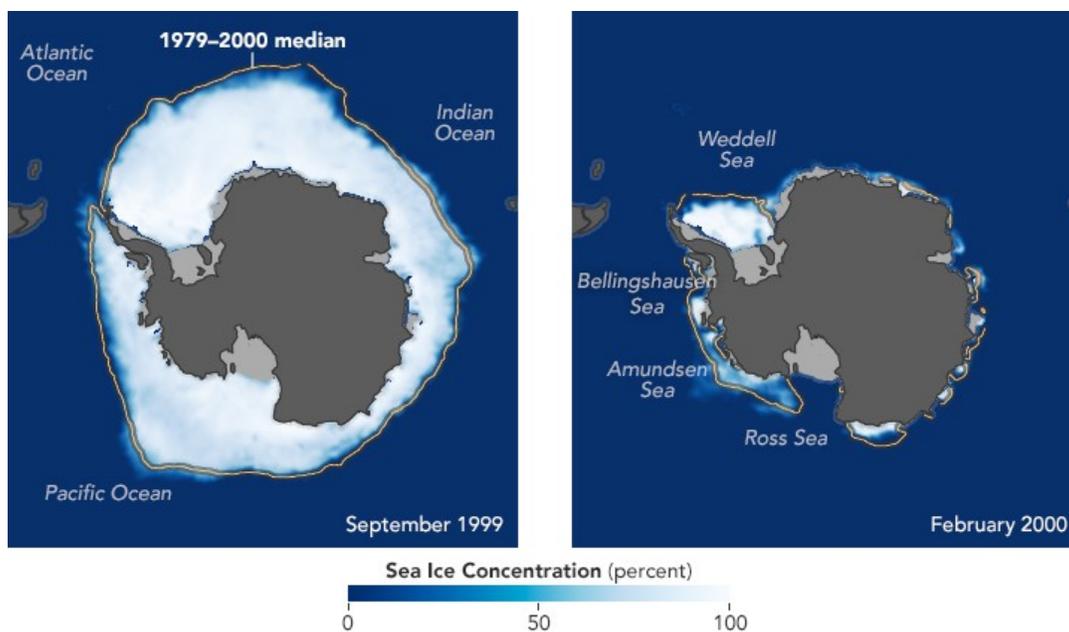
C. In the last 35 years of the twentieth century the Arctic Ocean ice thinned by 40 percent. In 2000, the polar ice at the top of the world melted for the first time in human memory. Many scientists believe there had not been so much open water in the polar region in 50 million years. Other scientists predicted that summer ice in the Arctic Ocean could disappear entirely by 2035. In 2000 it was announced that of the 25 hottest years that had occurred since Earth temperature record keeping began in 1866, 23 of them had occurred after 1975. The rapid changes occurring in the Arctic region in the past 10-20 year have become one of the biggest stories in climate change. Temperatures in the Arctic are rising higher than anywhere else on Earth – and more quickly as well. Sea ice has been melting in the summer season at an astonishing rate, and scientists are only beginning to understand the consequences of this thaw for global climate patterns, let alone its anthropogenic causes. Less sea ice ostensibly means more opportunities for shipping and resource extraction, and, troublingly for many, it could result in the opening of previously inaccessible offshore oil and gas fields in the Arctic Ocean and its outlying seas. In the first half of 2010, air temperatures in the Arctic were 4 degrees Celsius warmer than during the 1968-96 reference period while, over the past half century, much of the Arctic experienced warming of over 2 degrees Celsius, with relative warming increasing at higher latitudes.



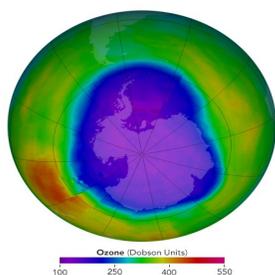
1. The most dramatic consequence of this warming trend has been the loss of summer sea ice, which reached a record low in 2012 of 3.6 million square kilometers, or 52 percent below the 1979-2000 average. Overall, summer ice minimum extent, which occurs every year in September, has declined 13.3 percent per decade relative to the 1981-2010 average. Trends show a loss of 2.6 percent per decade. The major treaties that apply to the Arctic are: the UN Convention on the Law of the Sea, the Basel Convention on the Control of Transboundary Movement of Hazardous Waste and Their Disposal, the UN Framework Convention on Climate Change, the UN Convention on Biological Diversity, its Biosafety and Liability Protocols, a broad range of conventions and other instruments

adopted by the International Maritime Organization (IMO), the London (dumping) Convention of 1972 and its 1996 Protocol, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Stockholm convention on Persistent Organic Pollutants, and the Ramsar Convention on Wetlands of International Importance.

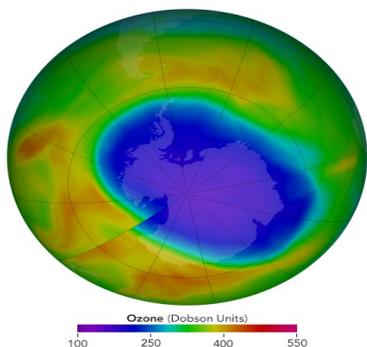
2. Unlike the Arctic—an ocean basin surrounded by land—the Antarctic is a large continent surrounded by an ocean. Because of this geography, sea ice has more room to expand in the winter. But that ice also stretches into warmer latitudes, leading to more melting in summer. Antarctic sea ice peaks in September (the end of Southern Hemisphere winter) and usually retreats to a minimum in February. Since the start of regular satellite observations in 1979, total Antarctic sea ice has increased by about 1 percent per decade. Whether the increase is a sign of meaningful change is uncertain because ice extents vary considerably from year to year around Antarctica. For three consecutive Septembers from 2012 to 2014, satellites observed new record highs for winter sea ice extent. These highs occurred while the Arctic was seeing record lows. Starting in 2016, prominent decreases in sea ice around Antarctica started to occur. It was too soon to say if the decline marked a shift in the behavior of Antarctic sea ice. Within Antarctic sea ice, there is great variation from place to place around the continent. The Ross Sea sector has had a significant positive trend, while sea ice extent has decreased in the Bellingshausen and Amundsen Seas. In short, Antarctic sea ice shows a small positive trend, but large-scale variations make the trend very noisy.



3. The stratospheric ozone layer protects life on Earth by absorbing ultraviolet light, which damages DNA in plants and animals (including humans) and leads to skin cancer. Prior to 1979, scientists had not observed concentrations below 220 Dobson Units. But in the early 1980s, through a combination of ground-based and satellite measurements, scientists began to realize that Earth’s natural sunscreen was thinning dramatically over the South Pole each spring. This large, thin spot in the ozone layer came to be known as the ozone hole. Scientists use the word hole as a metaphor for the area in which ozone concentrations drop below the historical threshold of 220 Dobson Units. Using this metaphor, they can describe the hole’s



size and depth. The series begins in 1979. The maximum depth of the hole that year was 194 Dobson Units (DU)—not far below the historical low. For several years, the minimum concentrations stayed in the 190s, but beginning in 1983, the minimums got deeper rapidly: 173 DU in 1982, 154 in 1983, 124 in 1985. In 1991, a new threshold was passed; ozone concentration fell below 100 DU for the first time. Since then, concentrations below 100 have been common. The deepest ozone hole occurred in 1994, in the image embedded in this paragraph, when concentrations fell to just 73 DU on September 30, 1994 in the image embedded in this paragraph. Records in depth and size haven't occurred during the same years (the largest ozone hole occurred in 2006), but the long-term trend in both characteristics is consistent: from 1980 through the early 1990s, the hole rapidly grew in size and depth. Since the mid-1990s, area and depth have roughly stabilized, but continue to dip to 100.

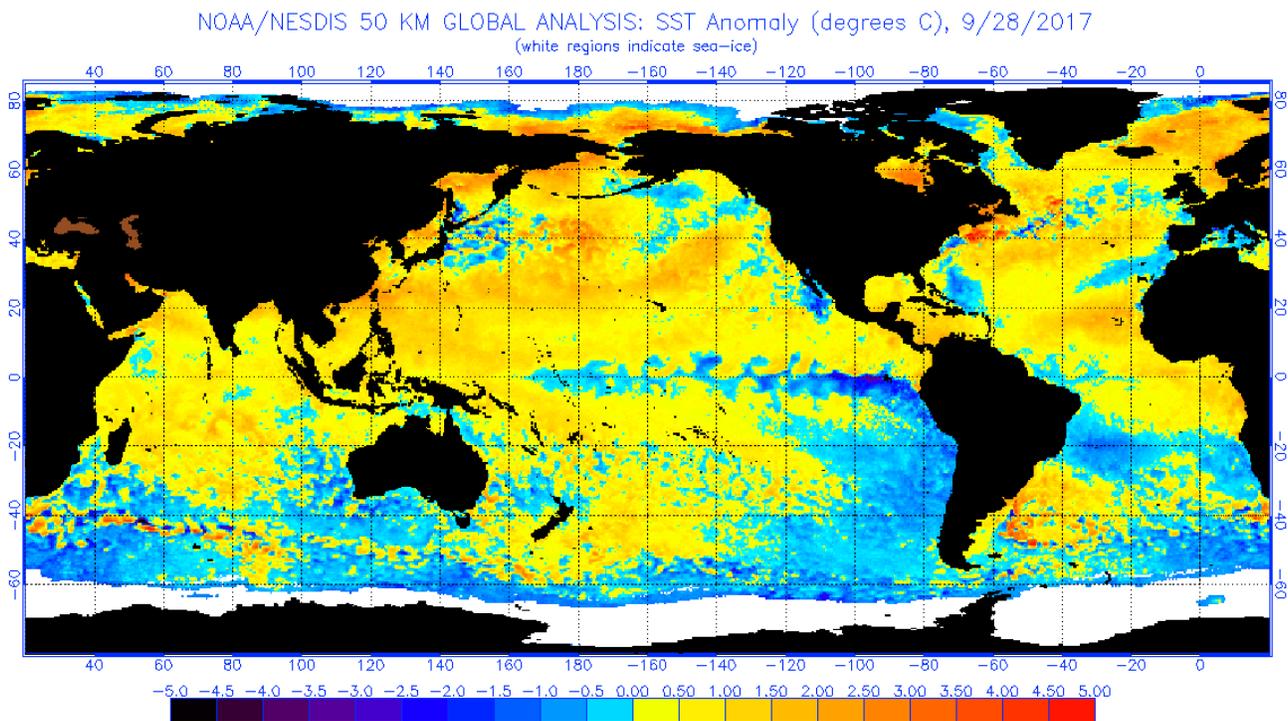


4. The ozone hole opened the world's eyes to the global effects of human activity on the atmosphere. It turned out that chlorofluorocarbons (CFCs)—long-lived chemicals that had been used in refrigerators and aerosol sprays since the 1930s—had a dark side. In the layer of the atmosphere closest to Earth (the troposphere), CFCs circulated for decades without degrading or reacting with other chemicals. When they reached the stratosphere, however, their behavior changed. In the upper stratosphere (beyond the

protection of the ozone layer), ultraviolet light caused CFCs to break apart, releasing chlorine, a very reactive atom that repeatedly catalyzes ozone destruction. The global recognition of CFCs' destructive potential led to the 1989 Montreal Protocol banning of the production of ozone-depleting chemicals. Scientists estimate that about 80 percent of the chlorine (and bromine, which has a similar ozone-depleting effect) in the stratosphere over Antarctica today is from human, not natural, sources. Models suggest that the concentration of chlorine and other ozone-depleting substances in the stratosphere will not return to pre-1980 levels until the middle decades of this century. These same models predict that the Antarctic ozone layer will recover around 2040.

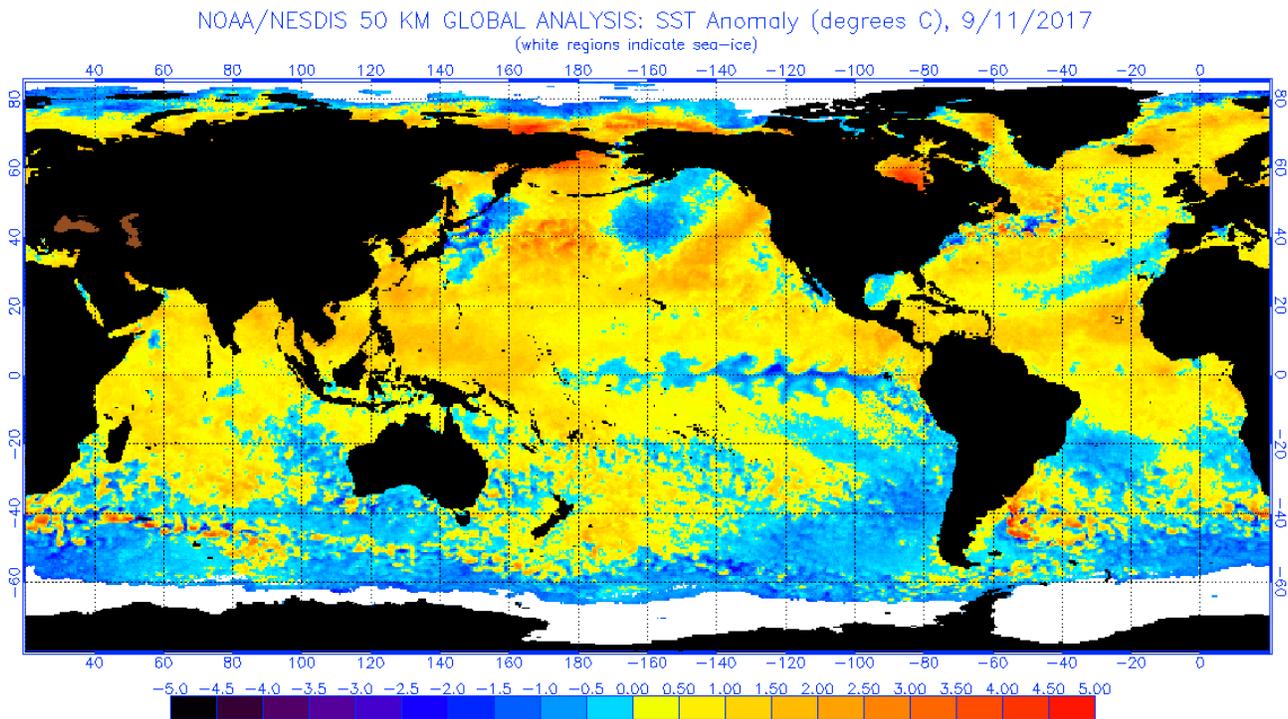
E. Patents for devices or methods for influencing weather conditions receive Cooperative Patent Classification A01G 15/00. To neutralize four decades of global warming these inventions require review under the Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques (ENMOD) of 1978 and Arson within the maritime and territorial jurisdiction under 18USC§81. Caucasian news meteorology, must stop making small Harvard hailstones and lightning, and learn to extinguish forest fires to chill ambient temperatures during prolonged summer droughts, by rainmaking with Weather modification by royal rainmaking technology US 20050056705 A1 published March 17, 2005 by Bhumibol Adulyadej His Majesty King of Thailand and reduce coastal temperatures to less than 78.8°F (26°C) with Methods and apparatus for reducing the intensity of hurricanes at sea by deep water upwelling US 20090272817 A1 published on November 5, 2009. The United States has long held that silver iodide and cloud seeding preparations in general, are urea for the prior restrictions on use of human subjects for testing of biological or chemical agents under 50USC§1520a. Texas needs to redress the recent spate of flooding, by prohibiting the use of snow machines on oil platforms and ships in the Gulf of Mexico as Processes and apparatus for reducing the intensity of tropical cyclones US 9736996 B2 published August 22, 2017 and US 9750202 B2 of September 15, 2017. Gulf Coast oil platforms are advised to sell the snow machines to ski resorts and use as their Methods and apparatus for reducing the intensity of hurricanes at sea by deep water

upwelling US 20090272817 A1 published on November 5, 2009 that eliminates ambiguity regarding heat storage from the otherwise chill language used in Methods of and Means for Weather Modification that was granted to Geophysical Engineering Co. US Patent 4470544 A published on September 11, 1984. US news meteorology needs to test the safety and effectiveness of (a) Hail suppression and rain enhancement rocket projectile based on warm cloud catalyst CN106839900 A published by European Patent Office on July 13, 2017 in comparison, with (b) the airplane delivery of similar chemicals exhibited in Weather modification by royal rainmaking technology US 20050056705 A1 and (c) mount snow machines to be deployed from mountaintops to make rain and support fire fighting water cargo airplane, helicopter, or ships delivering non-polluting frozen H<sub>2</sub>O snow machines, that accidentally caused so much flooding in Texas 2016-17 without being applied to Rainmaker US 3429507 A published Feb. 25, 1969.



1. Mitigating global warming by otec-induced ocean upwelling WO 2016160735 A1 published October 6, 2016. OTEC platform and ship borne upwelling, promises to mitigate global warming substantially by combining elements from two separate fields in a novel way, that require regulation to be turned off when not in use, and pass into the genre of non-fiction devices or methods for influencing weather conditions under Cooperative Patent Classification A01G 15/00. Evidence of global warming, is easily proven, that every one of the past 40 years has been warmer than the 20th century average. 2014, 2015 and 2016 were the hottest years on record and 2017 the second. The 13 warmest years on record have all occurred since 1998. The United States might benefit from Atlantic and Pacific fleets of OTEC ships or platforms, who agree to be turned off when in use as devices or methods for influencing weather conditions under Cooperative Patent Classification A01G 15/00. OTEC is based on the discovery that the volumetric rate of cold water upwelling that will result in a 1.08° C reduction in the Earth's Surface Air Temperature (SAT) is similar to the volumetric rate of cold water upwelling that would be produced by roughly 20,000 OTEC plant-ships of 400 MW size each. These can generate 7 terawatts of electric power converted to an ammonia energy carrier and shipped to on-land locations,

where it can be "cracked" and burned as CO<sub>2</sub>-free fuel for power plants. The large reduction in SAT enables proposal of an affordable financial strategy that would pay most of the costs of the system out of the revenue from CO<sub>2</sub> emission allowances granted by governing agencies for alternative energy systems that also cause a direct reduction in SAT. OTEC systems are viable anywhere surface water is warm. OTEC systems generate both electricity and ammonia. The fact that OTEC systems generate electricity and ammonia, that must be sold, may pollute and most of all creates such a conflict of interest that their money-making owners against have omitted a clause turning these climate cooling and cloud-making devices off when not in use, nor adequately citing weather control patents.



2. So as not to create an arms race to best recreate a natural climate in hostile negotiations with global warming terrorists, OTEC, and other sea surface cooling pumps, must be turned off when not being used to treat dangerous climatic conditions such as coral polyp bleaching, hurricanes, extended drought and forest fires causing extremely hot summer weather, within one-hour, just like hostile heating pumps under Art. 1 and (b) removal of said heating pumps from circulation in the north atlantic by magnet and cable to oil tanker or warship under Art. 5 of the Hague Convention VIII Relative to the Laying of Automatic Submarine Contract Mines under penalty for war crime under 18USC§2441(c)(4) of a person who, in relation to an armed conflict and contrary to Protocol (II) on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices as amended at Geneva on 3 May 1996. Acquisition of maritime territory for the operation of OTEC upwelling systems would not be legal, unless the patent or an internationally recognized law, made it clear that OTEC upwelling systems, whether fixed platform or mobile, would be turned off when not in use. It is essential that OTEC upwelling systems are turned off when not in lawful use of Patents for devices or methods for influencing weather conditions that receive Cooperative Patent Classification A01G 15/00, and this be included in the OTEC patent or international recognized agreement. The turn OTEC off when not in use clause is necessary to news meteorology, specifically to prevent flooding and winter storms, and in general to create a maritime system capable of achieving complete peace, defined as a natural climate,

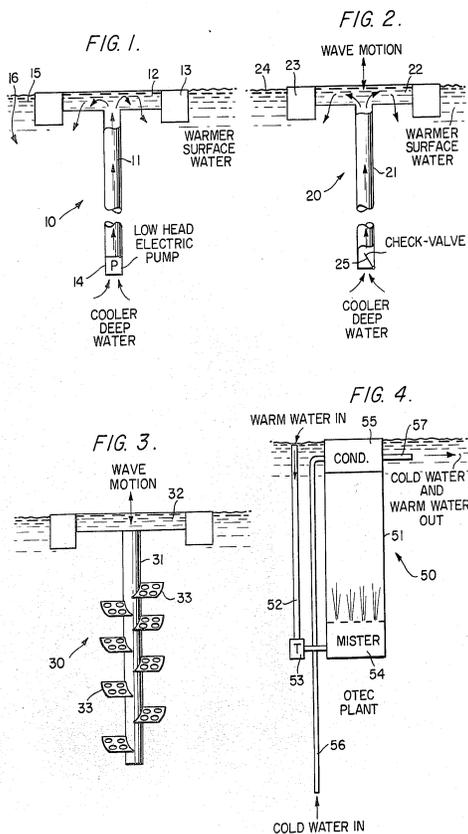
without any artificial weather modification to be regulated by the Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques (ENMOD) of 1978.

## §27 Oceanic Heating and Refrigeration

U.S. Patent

Sep. 11, 1984

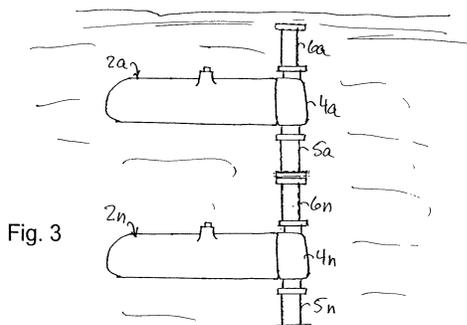
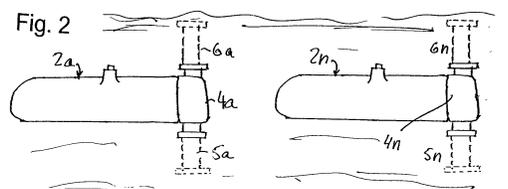
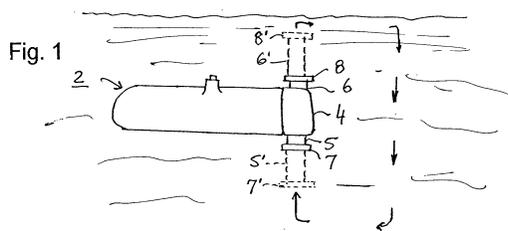
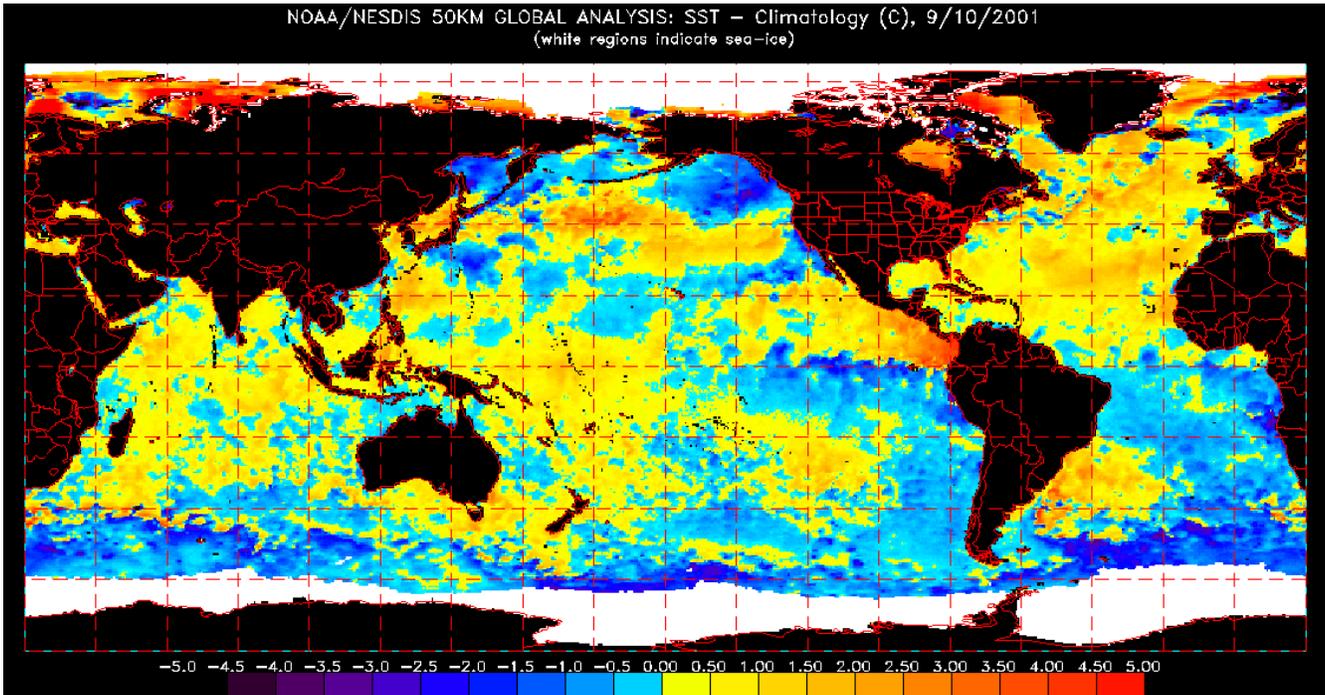
4,470,544



A. On September 11, 1984 US Patent 4470544 A Methods of and Means for Weather Modification was granted to Geophysical Engineering Co. It held, the presence of large bodies of water, such as oceans, seas or large lakes, affects the weather in adjacent westwardly located land masses due to prevailing westerly winds. The effect is illustrated by comparing winter weather conditions between Portland, Oregon, on the west coast of the North American continent and Halifax, Nova Scotia on the east coast; or between Bordeaux, France near the west coast of the European continent with Vladivostok, USSR on the east coast of the Asian continent. Each of these cities is located at approximately 45 degrees north latitude, but winter in the cities on the western coasts of continents is considerably milder than winter in cities on the eastern coasts of continents. The only flaw with US Patent 4470544 is that some language left heat storage open to interpretation by global warming citation. US Patent 4470544 provides a method for modifying the weather near continental arid zone by increasing the heat storage of the seas westwardly of said zone during the summertime. Reduction of the surface temperature of the sea near coastal areas in the summer will modify the weather in the coastal region because the summer air temperature over the sea follows the water temperature; and with this reduction in temperature, the summer air temperature in the coastal region will be reduced.

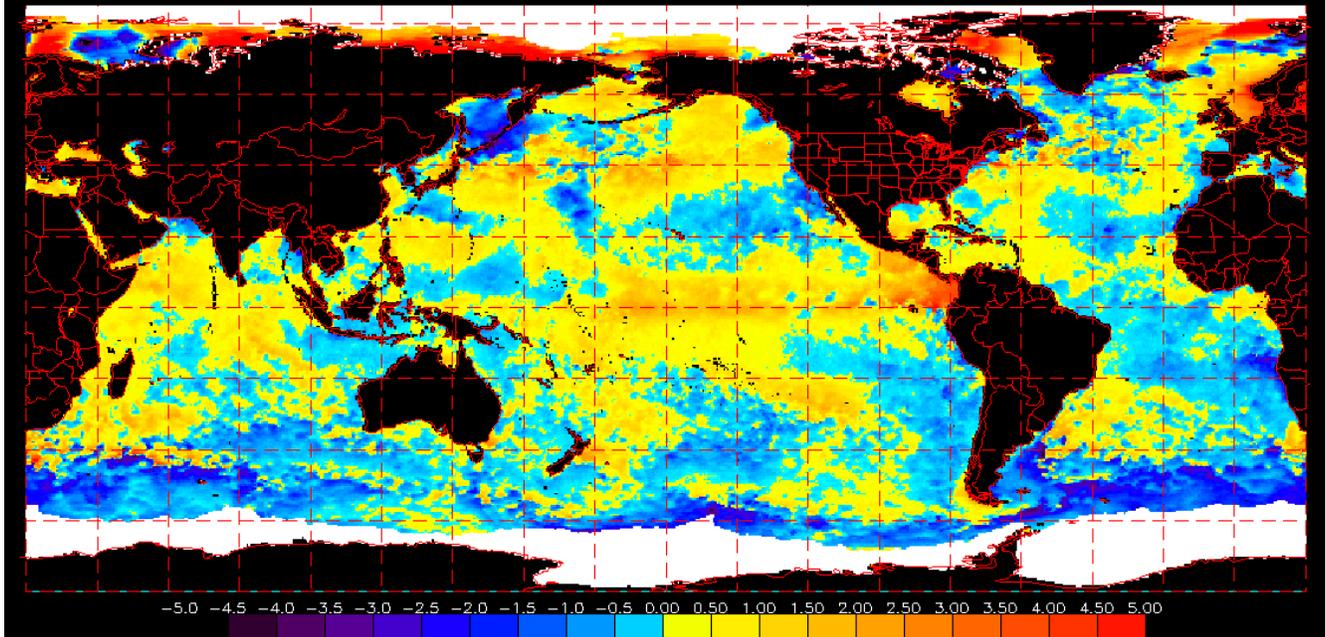
1. In order to cool the surface of the sea in the summertime, the present invention contemplates mixing surface water with cooler deep water, this being achieved by pumping water from a lower level of the sea to the upper level. Preferably, this is achieved by wave motion which permits two modes for the pumping operation. In one embodiment, the mixing is achieved by paddles that are operated by wave motion. In another embodiment, the wave motion is utilized as a pump for lifting deep water to the surface. Subsequently, a number of oceanic upwelling systems have been devised to reduce sea surface temperature, and they require comparative review of their effectiveness at cooling the climate and maritime pollution and safety. The thermal safety and effectiveness, and therefore possibly minimum amount of maritime chemical pollution by the accidental release of industrial chemicals, by any and all oceanic cooling systems, can be enhanced by adapting to A.S. Trust & Holdings blend of pure

hydrocarbon refrigerant, that was been designated R441A by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) in 2011.



2. Global warming is at the heart of the increase in hurricane intensity and frequency of recent years. The onset of hurricanes can be easily detected in real time by satellites. Method and System For Hurricane Control U.S. Patent Publication No. 2002 0008155 dated Jan. 24, 2002, proposes a method and system for inhibiting or weakening the formation of hurricanes, by detecting the onset of a hurricane in a region of open water and immediately cooling the surface water in the open water region. In the described preferred embodiments of that application, the surface water is cooled by using one or more nuclear-powered submarines to pump cooler water at a depth in the open water region to the surface of the open water region.” There is thus a present need to modestly decreasing upper ocean heat content over a large region in the path of a hurricane within 24 to 48 hours before landfall, and preferably, to avoid undue negative effects on ocean life from continuously cooling the upper ocean even when no hurricanes are evident, there is a need to enable the optimum number of pumps directly in the path of the hurricane for only a day or two before the hurricane passes across the region.

NOAA/NESDIS 50KM GLOBAL ANALYSIS: SST - Climatology (C), 9/14/2002  
(white regions indicate sea-ice)



3. The term “hurricane” as used in Method and apparatus for reducing the intensity of hurricanes at sea by deep-water upwelling US 20090272817A1 refers to any tropical storm system with a sustained wind speed of at least 74 miles per hour (equivalent to 64 knots, 119 km/hr, or 33 m/sec). Such tropical storms are variously referred to as “hurricanes” in the Atlantic Ocean, “typhoons” in the western Pacific Ocean, and “tropical cyclones” or simply “cyclones” in the Southern Hemisphere. Atlantic hurricanes are likely to bring greater amounts of precipitation on shore in a warming world and may increase in intensity, according to the report. Small tidal floods have already increased between five-fold and 10-fold since the 1960s in U.S. coastal cities, and the rate of these floods continues to increase in 25 cities along the U.S. Gulf and Atlantic Coasts. Because tropical storms draw their energy from the heat content of the upper ocean, it is generally accepted that a large area of cooled ocean surface can suppress hurricane intensity. Numerical modeling studies at the Massachusetts Institute of Technology suggests that reduction of sea surface temperature by 2.5° C. in the storm's central core would eliminate the thermodynamic conditions that sustain hurricanes. The physics of natural and artificial hurricane intensity control appear to be governed by sea surface temperature (SST) and the thermal structure (density stratification) of the upper ocean. These influences are combined into a single parameter, Hurricane Heat Potential (HHP), which is used by meteorologists to quantify the heat energy in the upper ocean that is available to fuel a tropical storm. Since SSTs less than 26° C. Typically cannot support hurricane development, HHP is defined as the heat content in excess of 26° C (78.8° F).

4. Methods and apparatus for reducing the intensity of hurricanes at sea by deep water upwelling are described in US 20090272817 A1 published on November 5, 2009. A method may include positioning a fleet of submersibles in an area of ocean through which at least a portion of a hurricane's central core will pass within a predetermined amount of time. The submersibles are maneuvered to a depth greater than a depth of a thermocline in this area of ocean. The submersibles maintain their station and depth for a finite amount of time, during which they may release a gas to form bubble plumes which rise toward the ocean's surface. The bubble plumes entrain and upwell cold sub-thermocline water toward

the surface of the ocean to cool the surface of the ocean. The cooled ocean surface reduces the intensity of the hurricane whose portion of central core passes through the cooled area. An apparatus to generate a bubble plume may include a gas source, a gas manifold to releasably collect gas from the gas source, and a cover having perforations of a predetermined shape, size, and spacing to produce a predetermined rate of upwelling of seawater. The apparatus may further include a duct to receive at least a portion of the generated bubble plume and channel the cold upwelled seawater toward the surface of the ocean.

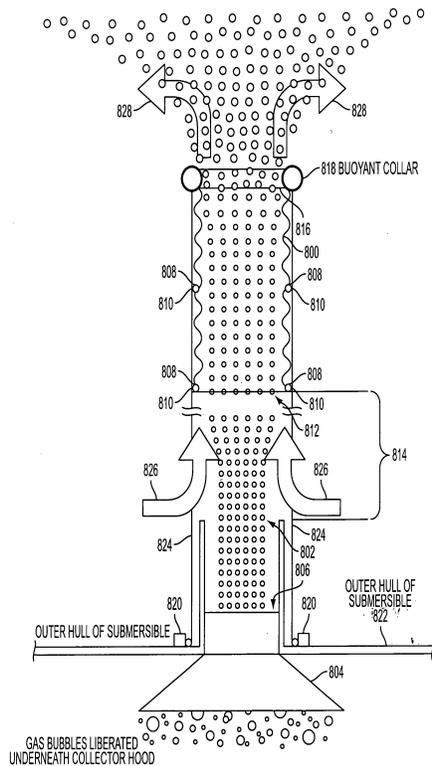


FIG. 8

B. At least three possible types of submersible payload delivery systems are disclosed to implement mobile interception strategies. These embodiments are: (1) An all-purpose submersible that comprises gas storage vessels, gas release mechanisms, manifold hoods, ballast tanks for buoyancy control, and a submersible maneuvering system, which includes: communications, power supply, propulsion mechanisms, and position/attitude control surfaces. (2) A carrier delivery system whereby a dedicated maneuvering submersible has fixed “wings” to carry gas storage and release vessels. The ballast system remains in the maneuvering submersible. (3) A towed delivery system whereby a dedicated maneuvering submersible tows a series of gas storage and release submersibles, which contain ballast tanks for buoyancy control as gas is released. Any one of the three submersible embodiments could incorporate the two artificial upwelling inventions described earlier, namely (1) a gas collector hood with bubble release manifold and (2) a hybrid free bubble plume with partial airlift duct. Additionally the partial airlift duct could be retracted during submersible maneuvering and then deployed once the submersible is in its upwelling position. Submersibles may be manned or unmanned. Liquid carbon dioxide (LCO<sub>2</sub>) is a preferred gas liberation source, since LCO<sub>2</sub> payloads may require the least

containment structure or insulation. This is because CO<sub>2</sub> exists naturally as a liquid at the pressures and temperatures found just below the operating depth of the bubble plumes. Thus, for example, when implementing a mobile hurricane interception method, the AUVs may deploy and maneuver in the depth range 500-600 m, where CO<sub>2</sub> exists naturally as a liquid. When in position and ready to start bubbling, the AUVs could simply rise a water depth of 200-300 m, where the drop in pressure and rise in temperature is sufficient to cause the LCO<sub>2</sub> to boil, thereby liberating bubbles into the collector hood. Note that the depth at which the AUV's or other submersibles generate bubble plumes may be referred to herein as the “operating depth,” regardless of the type of gas used to generate the bubble plumes.

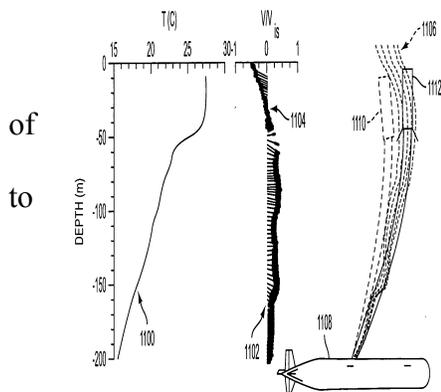
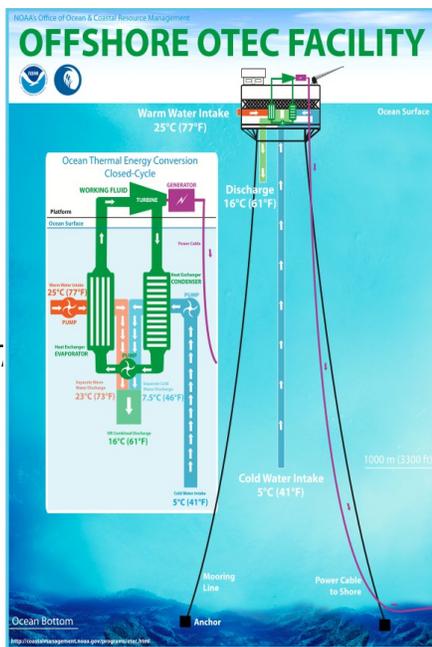


FIG. 11

C. In a stationary hurricane interception strategy, a sea surface area

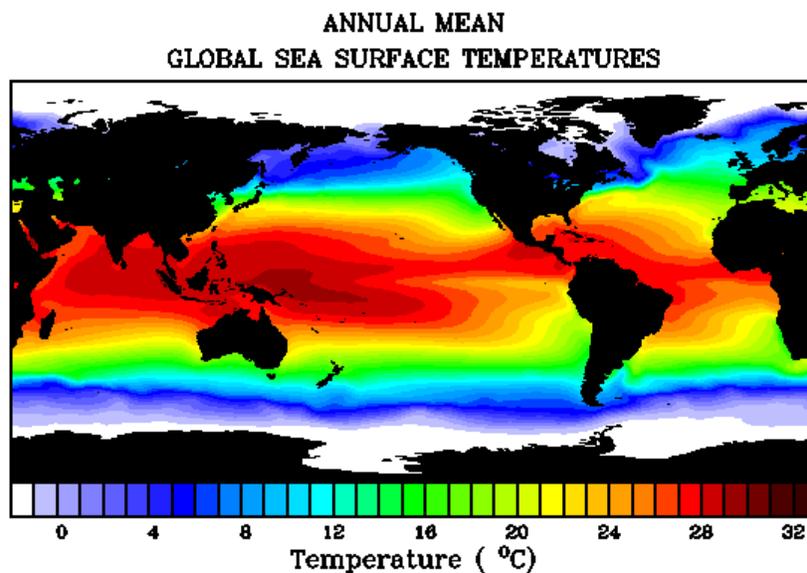
of about 180 by 540 km ( $9.72 \times 10^{10}$  m<sup>2</sup>) should be cooled to a depth of about 70 m, which gives a total volume of about  $6.80 \times 10^{12}$  cubic meters. Recall that although the E Fla area has a sea surface temperature of 28.8° C., winds and waves may be expected to fully mix this “skin” temperature to the depth of the 26° C. isotherm by the time the storm arrives. Therefore, upwelling calculations assume that the entire volume has an average temperature of 27.74° C. Estimate temperature of upwelling water: Numerical modeling results presented below show that the optimal cooling effect can be obtained by free bubble plumes originating at a depth of 300 m below the sea surface. As detailed in that section, the temperature at that depth in the design environment of the East Florida interception area is estimated to be 15° C. Since the rising bubble plumes entrain surrounding seawater from the depths through which they rise, the plume water warms to a temperature of 20.2° C. by the time it reaches the mixed layer above the 26° C. isotherm. The fraction,  $f$ , of the total interception area volume that must be replaced by upwelling water, in order to achieve a final layer temperature of 26° C. is given by the following equation:  $f \times 20.2 + (1-f) \times 27.74 = 26$  where 20.2 is the temperature of the upwelling water, 27.74 is the temperature of the water that it is replacing, and 26 is the desired final layer temperature, all in degrees Centigrade. Solving the above equation for  $f$  indicates that 23% of the total layer volume ( $6.80 \times 10^{12}$  m<sup>3</sup>) should be replaced by upwelling water, which amounts to a total upwelling plume volume of  $1.57 \times 10^{12}$  m<sup>3</sup> over a 24-hour period. This corresponds to a total upwelling rate of 18.2 million cubic meters per second.



D. Mitigating global warming by otec-induced ocean upwelling WO 2016160735 A1 published October 6, 2016, promises to make money generating electricity, ammonia and even potable water, while mitigating global warming substantially with cold-water upwelling. It is based on the discovery that the volumetric rate of cold water upwelling that will result in a 1.08 C reduction in the Earth's Surface Air Temperature (SAT) is similar to the volumetric rate of cold water upwelling that would be produced by roughly 20,000 OTEC plant-ships of 400 MW size each. These can generate terawatts of electric power converted to an ammonia energy carrier and shipped to on-land locations, where it can be "cracked" and burned as CO<sub>2</sub>-free fuel for power plants. The large reduction in SAT enables proposal of an affordable financial strategy that would pay most of the costs of the system out of the revenue from CO<sub>2</sub> emission allowances granted by governing agencies for alternative energy systems that also cause a direct reduction in SAT. OTEC systems are viable anywhere surface water is warm. OTEC systems generate both electricity and ammonia that must be sold and may

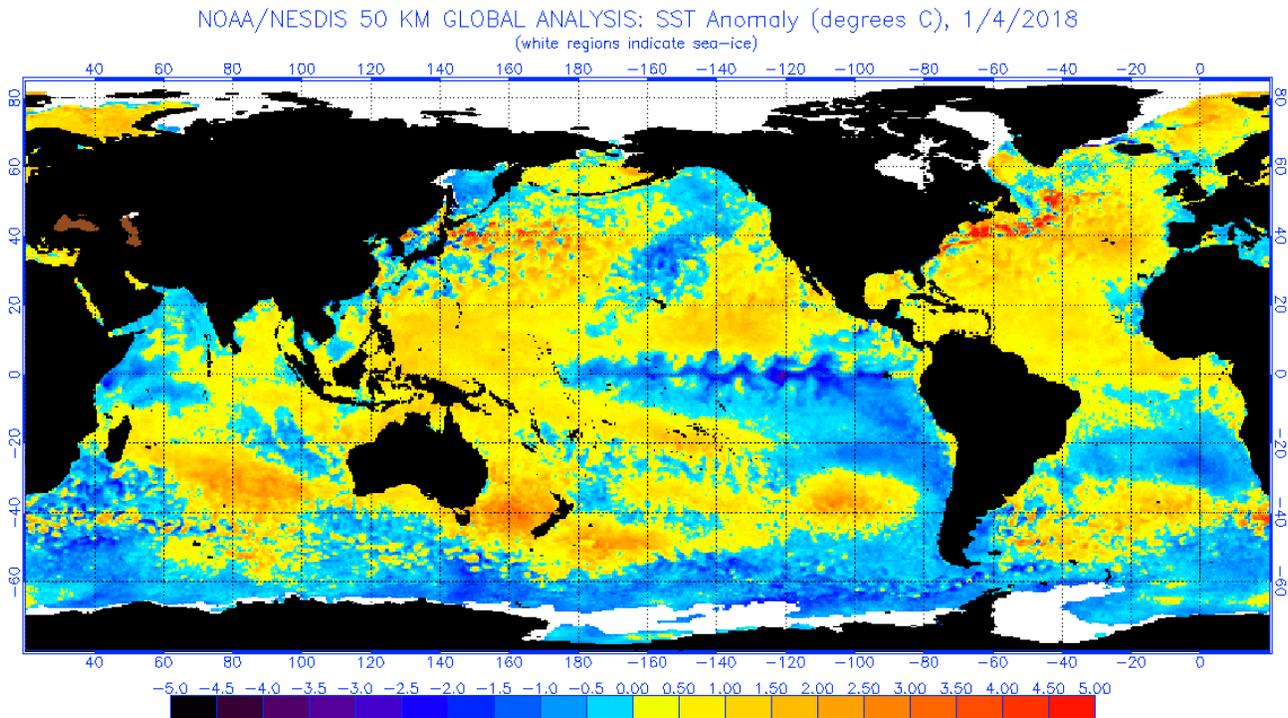
pollute and create a conflict of interest that might predispose their money-making owners against turning these climate cooling and cloud-making devices off when not being used to control dangerous climatic conditions such as hurricanes, extended drought and forest fires causing extremely hot summer weather, within one-hour under Art. 1 and (b) removal of said heating pumps from circulation in the north atlantic by magnet and cable to oil tanker or warship under Art. 5 of the Hague Convention VIII Relative to the Laying of Automatic Submarine Contract Mines under penalty for war crime under 18USC§2441(c)(4) of a person who, in relation to an armed conflict and contrary to Protocol (II) on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices as amended at Geneva on 3 May 1996.

1. Ocean thermal energy conversion (OTEC) makes use of the temperature differences between the deep cold and relatively warmer surface waters of the ocean to generate a constant, clean source of electricity. This constancy differs from the output of renewable resources such as wind and wave energy that sometimes produce intermittent electricity because of weather changes. The Ocean Thermal Energy Conversion Act (OTECA) of 1980 limits the ownership, construction and operation of offshore ocean thermal energy facilities and plantships to those licensed by the National Oceanic and Atmospheric Administration (NOAA). A project certified by the Department of Energy (DOE) as a demonstration project is exempt from being required to obtain an OTEC license from NOAA, pursuant to the Ocean Thermal Energy Conversion Research, Development, and Demonstration Act (42 U.S.C. 9001 et seq.). Any dredging or placement of structures in navigable waters of the United States that is associated with the construction and installation of an OTEC facility will have to comply with Section 10 of the Rivers and Harbors Act of 1899 as administered by the USACE.



2. The development of OTEC technology has promise in tropical areas, where year-round temperature differences between the deep cold and warm surface waters are greater than 20 degrees Celsius (36 degrees Fahrenheit). This energy technology also has the potential to generate potable water, hydrogen, and ammonia. In the waters of tropical and subtropical locales, including Hawaii, long days of intense sunlight result in significant heating of the upper 35 to 100 meters of the ocean, yielding comparatively warm (27 - 29°C) ocean surface waters. Below this warm surface layer the temperature decreases to an average of about 4.4°C. This temperature differential represents a significant amount of potential energy, which, if harnessed, is a renewable source of energy. One potential method of extracting this energy is ocean thermal energy conversion (OTEC). In a closed-cycle OTEC facility, both the warm and cold seawater pass through heat exchangers which transfer heat to and from seawater to a working fluid with a low boiling point (e.g., ammonia). After the seawater has passed through the heat exchanger it is discharged back into the ocean whereas the working fluid goes through cycles of vaporization and condensation which drives a turbine generator to produce electricity. In an open-cycle OTEC facility, warm surface seawater is placed in a low-pressure environment driving it to steam. The expanding steam then drives a low-pressure turbine generator to produce electricity. The steam can then be condensed into desalinated fresh water by exposure to the cold temperatures from deep-

seawater. It is estimated that 3-5 m<sup>3</sup>/sec of warm surface water and a roughly equivalent amount of cold deep ocean water are required for each megawatt (MW) of power generated. For a commercial-size facility (i.e., 100 MW) the total required flows for the warm and cold seawater would likely be between 600 – 1000 m<sup>3</sup>/sec, roughly 14 to 22 billion gallons per day, and would vary with facility design considerations.



E. The cold water upwelling Methods of and Means for Weather Modification US Patent 4470544 A granted to Geophysical Engineering Co. on September 11, 1984 should not be used in the east coasts at temperate latitudes and must be turned off when not in use mitigating global warming to minimize disturbance to weather systems. Cold water upwelling must be turned off if the low pressure causes adverse winds elsewhere. For instance, December 2017 Canada needs to turn of the cold water upwelling off the Coast of British Columbia, that successfully extinguished forest fires and chilled the unlawful warming of the Hudson Bay. The Santa Anna winds from the North Korean ballistic missile tests are enhancing the jet stream from the Gulf stream that is superheated from the Potomac to Nova Scotia. Styrene UN2055 railcar heating pumps have been distinguished from other fuels, that might be used in oceanic heating pumps that must be turned off within one hour that they cease to lawfully control the weather, under Art. 1 and extinguished styrene heating pumps from circulation in the north atlantic by magnet and cable to oil tanker or warship under Art. 5 of the Hague Convention VIII Relative to the Laying of Automatic Submarine Contract Mines because after the TBC wears out in 3 months the railcars self-ignite, if they were not remotely ignited, and whereas thousands of Americans have died because of man-made global warming weather conditions, presumably caused by the clandestine use of said submersible styrene railcar heating pumps and other oceanic heating pumps that require chemical intervention to prevent self-ignition, are distinguished from more stable fuels as a war crime under 18USC§2441(c)(4) of a person in relation to an armed conflict and contrary to Protocol (II) on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices as amended at Geneva on 3 May 1996 as styrene railcar oceanic heating pumps apply to the termination of the

unlawful occupation at sea under the Fourth Geneva Convention on the Protection of the Civilian Population and as it relates to weather systems, the Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques (ENMOD) of 1978. Electrical and ammonia revenues from otec-induced ocean upwelling challenge Canada and Chile to a "turn off cold water upwelling when not in use mitigating global warming" clause to Mitigating global warming by otec-induced ocean upwelling WO 2016/160735 A1, US 2016/0290701 A1 both published October 6, 2016. This clause is needed for a (fleet) of cold water upwelling ship(s) to be granted one quick pass for news meteorology, with radiation insurance through the East Pacific to the straights of Japan and then between New Zealand and Australia for the rest of the southern summer. A natural climate for United States East Coast. The SST Anomaly map is unchanged since the unsatisfactory finish to Hurricane season 2017.

## §28 Fuels

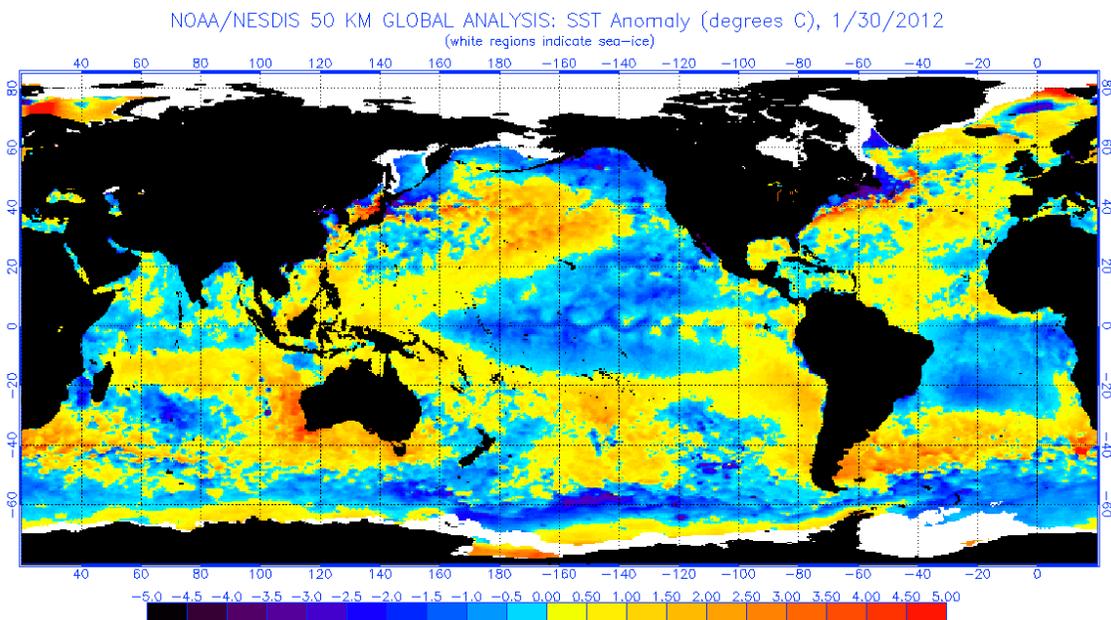
A. The energy sector is home to the world's most powerful companies. The large oil and gas companies are generally among the world's largest companies by revenues. Seven of the ten largest companies in the world in 2013, as ranked by Global Fortune 500 are in the energy sector: Royal Dutch Shell, Exxon Mobil, Sinopec Group, China National Petroleum, BP, China State Grid. By and large these companies hope, plan and lobby for the world to remain heavily dependent on oil and gas, despite the risks to ourselves and to future generations. These companies are able to win political support to stall the conversion to low-carbon energy through many tools: campaign financing, lobbying, and other means of persuasion. Some companies have gone so far as to promote antiscientific propaganda and to sow doubt in the public mind regarding well-known and mainstream science. With enough money, any big lie can be defended, at least for a while. In the United States, the wealthy Koch brothers, who own a major U.S. oil company among other interests, have financed an aggressive campaign against climate science and against measures to convert to low-carbon energy.

1. In response to the arrears the oil baron Secretary of State has proposed to the UN the International Court of Justice has been sought to impose a (3% = \$6 billion in 2015?) up to 6% US-UN tariff on US gas, oil, coal and electricity energy exports to punish the contempts of an oil baron to evade and defeat taxes under 26USC§7201 and Art. 19 of the UN Charter. To keep US coastal areas and weather free of oceanic hydrocarbon heating pumps, whose use is extremely limited to making wind in the direction of oceanic hydrocarbon cooling pumps for hurricane prevention and rainmaking to end drought and forest fires, that must be turned off when not in use fighting arson within the special maritime and territorial jurisdiction under 18USC§81. SIRC, the Styrene Information and Research Center, should be consulted for publication regarding the (a) non-polluting extinguishment of styrene railcar heating pumps with underwater application of TBC within one-hour under Art. 1 and (b) removal of said heating pumps from circulation in the north Atlantic by magnet and cable to oil tanker or warship under Art. 5 of the Hague Convention VIII Relative to the Laying of Automatic Submarine Contract Mines under penalty for war crime under 18USC§2441(c)(4) of a person who, in relation to an armed conflict and contrary to the provisions of the Protocol (II) on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices as amended at Geneva on 3 May 1996.

2. Processes and apparatus for reducing the intensity of tropical cyclones US 9736996 B2 published August 22, 2017 and US 9750202 B2 of September 15, 2017 are a procedure for moderating the intensity of a hurricane in regions of the seas that are host to the oil and gas industries to institute at least one line of defense against hurricanes utilizing oceanic oil platforms cold water upwelling and

snow machines. The snow machines must be prohibited to eliminate damages from unnatural flooding in Texas without extensive flood waterway and damn work. The coldwater upwelling is the one line of defense for the Gulf Coast, and may be off the western coast of North Africa, Caribbean. Another line of defense may be in the lands of the Western Hemisphere contiguous to These machines are carried on moving platforms that follow the hurricane and on fixed platforms that are located in the path of the hurricane. This invention takes advantage of the probability that some of those fixed platforms may be in the path of an oncoming hurricane, proposing accordingly to fit the fixed platforms with artificial snow-making devices, to supplement the efforts of the moving platforms wherever possible. The fixed platforms may each be fitted with means to pump cooler water from deep beneath the platform and use that water as feed to the snow making devices.

3. A hurricane that enters the Gulf of Mexico as a Category 1 or 2 storm may increase its intensity to as much as Category 3 or 4 before making landfall, owing to the presence of surface-water temperatures that are typically in excess of 80 degrees F, 78.8 ° to be precise. The US Government once supported aviation research into methods of hurricane modification in a project called “Stormfury”. Under this project, scientists seeded clouds with silver iodide in a number of hurricanes including: Esther (1961), Beulah (1963), Debbie (1969), and Ginger (1971), but these were determined to be ineffective and experiment discontinued. Ambient air temperature cooling to prevent hurricanes by snow machine fails because their deployment on oil platforms on the Gulf Coast is probable cause of unprecedented flooding in Texas in recent years. These snow machines need to be sold to ski resorts and legitimate maritime coldwater upwelling supporting rainmaking operations. Processes and apparatus for reducing the intensity of tropical cyclones US 9736996 B2 published August 22, 2017 and US 9750202 B2 of September 15, 2017 fail because snow machines required and cold water upwelling is optional. Methods and apparatus for reducing the intensity of hurricanes at sea by deep water upwelling US 20090272817 A1 published on November 5, 2009 wins the oil platform. The snow machine is a welcome non-toxic rainmaking solution for comparison for safety and effectiveness with the standard formulas used in Weather modification by royal rainmaking technology US 20050056705 A1 published March 17, 2005.



B. The most reliable method of cooling the ocean for hurricane prevention or rainmaking, has involved converting hydrocarbon heating pumps to A.S. Trust & Holdings blend of pure hydrocarbon refrigerant, that was designated R441A by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) in 2011. Following its development and approval, HCR188C/R441A has been widely used in retrofitted equipment to save costs and due to its use as a direct replacement for the refrigerants R12 and R134A, used in residential appliances, commercial refrigeration and auto-cooling systems. HCR188C/R441A was one of the first hydrocarbon refrigerants to be approved for sale by the U.S. Environmental Protection Agency under the Significant New Alternative Policy (SNAP) program for use in household refrigerators and freezers. MLT began testing it on a standard commercial 1.17m-wide, two-door unit in April 2015. The testing was done by substituting the original compressor, using HFC coolant R134a, which is currently being phased out worldwide due to its high global warming potential (GWP), with equal-capacity compressor running propane (R290). The compressor was then filled with the hydrocarbon blend HCR188C/R441A and has been running non-stop at rated temperatures. In comparison to R290, new data shows that the new NRC-2 system needs less of the HCR188C/R441A refrigerant and has achieved a 17% smaller charge and a 17% drop in energy consumption (test specifications: ambient temperature 23.8°C, relative humidity 45, interior temperature brought down to 3.3°C). Refineries are advised to convert, whatever hydrocarbons, can be salvaged from hydrocarbon heating pumps emanating from the District of Columbia to Nova Scotia, to HCR188C/R441A refrigerant.

1. Hydrocarbon refrigerants include a number of products including R290 (propane), R600a (isobutane), R1150 (ethene/ethylene), R1270 (propene/propylene), R170 (ethane) and various blends of these products. Hydrocarbon refrigerants have a wide range of applications. This includes commercial refrigeration, chill cabinets and vending machines, cold storage and food processing, industrial refrigeration, transport refrigeration, small air conditioning systems, large air conditioning and chiller systems, heat pumps and water heaters. Hydrocarbon refrigerants have some different chemical properties than fluorocarbon refrigerants; the primary difference are their classification as extremely flammable. A.S. Trust & Holdings has developed a line of refrigerants based on a ground-breaking blend of pure hydrocarbons. The unique formula of the initial product was designated R441A by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) since January 2011. R441A has been certified by independent testing laboratory Intertek (an) as having a very low Global Warming Potential (GWP) as well as a zero Ozone Depletion Potential (ODP). R441A is one of the first hydrocarbon refrigerants to be approved for sale in the United States by the U.S. Environmental Protection Agency under the Significant New Alternative Policy (SNAP) for use in household refrigerators and freezers. R441A operates with mineral oil and can be used as a direct replacement in residential appliances, commercial refrigeration units and automotive cooling systems designed for R12 and R134a. The company has also created a second formulation of blended pure hydrocarbons, designated as R443A by ASHRAE, which serves as a replacement for R22 in such applications as vending machines. Both formulas perform as refrigerants using smaller volumes than the traditional refrigerants they replace. While both R441A and R443A are flammable, the very small amount of these climate-friendly refrigerants required makes the risk assessment a non-factor. TEGA blends and distributes both HCR188C/R441A and HCR188C/R443A in Europe.

C. Heat pumps need a source of heat to transfer from, either the outside air, the ground, or a large body of water. Systems that transfer heat from the ground or water are called “geothermal heat pumps” and systems that transfer from the outside air are called “air-source heat pumps”. While any hydrocarbon may be used to cause heating and cooling of bodies of water using modern heat pump technology, its

dual use in fracking, drilling with expansive Styrofoam that further cracks the earth, styrene can cause earthquakes, and requires extra consideration in a national hazardous substance report on all hydrocarbons that could be diverted into oceanic heating and cooling. Styrene UN2055 and other chemicals that can undergo self-polymerization releasing heat are: Hydrogen cyanide, UN1051, Vinyl acetate, UN1301, Furfural or furfuraldehydes, UN1199, Propyleneimine, UN1921, and Ethyleneimine, UN1185, Ethylene oxide, UN1040, and Butadienes, UN1010. Any hydrocarbon can of course be used to create an industrial oceanic heating system, but railcar heating pumps, were determined to be fueled by Styrene polymer, and remotely ignited for Hurricane Katrina, that struck the Gulf Coast August 29, 2005, incidental to a military investigation of legislation similar to the State Department Strategic Climate Fund FY 18. The heat pumps were quickly extinguished and removed by magnet and cable by a Dutch warship. The NOAA SST Anomaly map does not clearly indicate their use in the Gulf at around the time of August 29, 2005.



1. Oceanic hydrocarbon heating pumps need to be detected by the Coast Guard, extinguished and removed by magnet and cable to an oil tanker or warship. Styrene has a flash point of 31 °C (88 °F) and an autoignition temperature of 490 °C (914 °F). Suitable extinguishing media are dry chemical carbon dioxide (CO<sub>2</sub>) and alcohol-resistant foam. High volume water jet is not sustainable extinguishing media. Do not allow run-off from fire fighting to enter drains or water courses. Styrene has a boiling point of 145 degrees Celsius and exists as a liquid under standard conditions. The vapor pressure is small at 5 hPa = 5 mbar at standard conditions. The flash point is at 31 degrees Celsius and a mixture with air is ignitable within 1 to 9 Vol %.

The increase in pressure due to heat generated within the tank can be attributed to polymerization of the styrene monomer within the tank.

2. Normally, a chemical inhibitor such as 15 parts per million of 4-tertiary-butyl-catechol (TBC) is added to the tank during transport to prevent polymerization, but this lasts only three months and tankers can idle longer. This inhibitor scavenges rust and other impurities within the tank that can act to initiate polymerization. Oxygen (about 10 ppm) is also required to be dissolved in the styrene monomer for the TBC to do its job. The TBC concentration decreases with time as it scavenges impurities; 15 ppm concentration would probably be mostly used up in possibly 3 months (even less time if ambient temperatures are warmer). Without the inhibitor, the styrene monomer can polymerize with oxygen to form a styrene-oxygen copolymer or benzaldehyde and/or formaldehyde and polymerize with the release of heat. The heat further accelerates the polymerization releasing more heat. Check temperature, inhibitor and polymer content at least once a week during warm weather. Increase monitoring frequency if stored at greater than 70°F for longer than 30 days. Minimize storage time. TBC seems to be SIRC's (Styrene Information and Research Center) secret ingredient for the chemical extinguishment of styrene fires on land and at sea.

3. SIRC, the Styrene Information and Research Center, should be consulted for publication regarding the (a) non-polluting extinguishment of styrene railcar heating pumps with underwater application of TBC within one-hour under Art. 1 and (b) removal of said heating pumps from circulation in the north Atlantic by magnet and cable to oil tanker or warship under Art. 5 of the Hague Convention VIII Relative to the Laying of Automatic Submarine Contract Mines under penalty for war crime under

18USC§2441(c)(4) of a person who, in relation to an armed conflict and contrary to the provisions of the Protocol (II) on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices as amended at Geneva on 3 May 1996.

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