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comments.
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CLOSE HOLDDocument No. 364381**WHITE HOUSE STAFFING MEMORANDUM**DATE: 11/24/92 ACTION/CONCURRENCE/COMMENT DUE BY: 12/07 10:00 a.m. MondaySUBJECT: ANNUAL ENVIRONMENTAL QUALITY REPORT

	ACTION	FYI		ACTION	FYI
VICE PRESIDENT	☐	☒	MCBRIDE	☐	☐
BAKER	☐	☒	MOORE	☐	☐
SCOWCROFT	☒	☐	MULLINS	☐	☒
DARMAN	☒	☐	PETERSMEYER	☐	☐
BATES	☐	☐	PORTER	☒	☐
BRADY	☐	☒	PROVOST	☐	☐
BROMLEY	☒	☐	ROSS	☐	☐
CALIO	☒	☐	SMITH	☐	☐
DEMAREST	☒	☐	TUTWILER	☐	☒
FITZWATER	☐	☒	ZOELLICK	☒	☐
GRAY	☒	☐	CLERK	☐	☒
HOLIDAY	☒	☐	CURTIS, Dale	☐	☒
HORNER	☐	☐	DELAND	☐	☒
			BOSKIN	☒	☒

REMARKS:

Please provide any comments directly to Dale Curtis, x5750, Rm. 156, with a copy of edited pages only to this office, NO LATER THAN 10:00 a.m., MONDAY, DECEMBER 7. Thanks.

RESPONSE:

OSTP
Concurs
Damar Hawkins
12/4/92

PHILLIP D. BRADY
Assistant to the President
and Staff Secretary
Ext. 2702



EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL ON ENVIRONMENTAL QUALITY
WASHINGTON, D.C. 20500

Michael R. Deland
Chairman

21.11.24 P10:27

(202) 395-5080

November 24, 1992

MEMORANDUM

TO: PHIL BRADY
FR: MIKE DELAND *Deland* for MRD
RE: ANNUAL ENVIRONMENTAL QUALITY REPORT

Enclosed is the review draft of the President's annual report to Congress on environmental quality, prepared by CEQ in concert with relevant federal agencies.

We would appreciate your assistance in circulating it to the appropriate White House officials for review and comments by **no later than 10 a.m. Monday, December 7.** We are on a timetable to send the report to the printer in January.

As reviewers look this over, they should have a few points in mind:

- The text will be very carefully edited for consistency of style, spelling, redundancy, etc. Reviewers should concern themselves primarily with factual clarifications.
- The current draft has been reviewed by all relevant federal departments and agencies. In each case, the most senior subcabinet official with policy oversight responsibilities was responsible for providing agency comments; some delegated the task to a senior aide.

The interagency review draft was also prepared with substantial agency input.

- An appendix that breaks down key environmental programs and highlights by state is nearly complete and will be circulated for review as soon as possible.
- The President's message to Congress and the Chairman's foreword will also be circulated for review at a future date.

Thank you.

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President's Message (to be prepared at a later date)

Chairman's Message (to be prepared at a later date)

PART I. ISSUE BRIEFS

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PART II. DATA AND TRENDS

A regular feature of the Environmental Quality report, this section contains over 100 tables and figures that provide additional detail about conditions and trends in the environment, prepared with the assistance of the Interagency Committee on Environmental Trends.

APPENDIX:

Federal Environmental Programs, By State.....
(under preparation, to be circulated at a later date)

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AGRICULTURE

Also see Forestry, Water, Wetlands, and related tables and figures in Part II.

U.S. agriculture is in the midst of a major transition motivated by economic factors, such as the budget deficit and international trade, as well as environmental concerns, such as water quality and quantity, topsoil erosion, and greater compatibility with the environment. In the midst of this change, U.S. agricultural policies seek to balance several objectives:

- An abundance of food and fiber at reasonable prices,
- Economic security for agricultural producers, and
- Conservation of natural resources.

Conditions and Trends

Between 1982 and 1987 U.S. cropland acreage increased by 1.4 million to 422.8 million acres, and nonfederal rangeland acreage decreased by 6 million to 401.7 million acres. Land use shifts can be complex. For example, the net increase in cropland reflected that 16.2 million acres of cropland were converted to other uses and 17.6 million acres in other uses were converted to cropland.

The environmental consequences of these land use shifts are also complex. Shifts of land from other uses to crop production

increase soil erosion and the risk of nutrient and pesticide contamination associated with current agricultural practices. Shifting land from crop production to other uses, on the other hand, increases environmental impacts from nonfarm uses, such as runoff of toxins from roadways and parking lots and vehicle emissions associated with urban development.

Since 1985 several hundred million acres of cropland have been idled as a result of conservation provisions in farm legislation. In 1987 alone 78 million acres out of a total cropland base of 328 million acres were idled under Farm Bill conservation and supply control provisions. In 1992 a total of 54 million acres were idled out of the 235 million acres of crop acreage base. This figure includes acreage enrolled in the Conservation Reserve Program.

Policies and Programs

Federal farm legislation in 1985 and 1990 linked farm program benefits and the conservation of natural resources. The Department of Agriculture (USDA) conducts conservation programs to reduce soil erosion, protect wetlands, maintain and enhance wildlife habitat, and improve water quality, while achieving supply-control and income-support objectives in a cost-effective manner.

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Conservation Compliance

The 1985 Farm Bill contained conservation compliance provisions that require farmers to develop and implement approved conservation plans on highly erodible cropland by 1995. Farmers who do not implement conservation plans lose USDA program benefits. As of 1992 field personnel of the USDA Soil Conservation Service had helped 1.3 million farmers develop compliance plans that will reduce erosion on 135 million acres of highly erodible cropland.

Compliance plans call for 215,000 miles of terraces, 1.3 million acres of grassed waterways, 4,200 miles of erosion-control diversions, cropland contour farming on 25 million acres, and cropland conservation tillage on 100 million acres. As of July 1992, farmers had implemented conservation plans on over half the acres requiring conservation practices.

To bolster conservation compliance, USDA supports alliances among agricultural businesses, commodity groups, grower associations, and the farm news media. These alliances encourage conservation practices such as leaving crop residue on the soil surface during critical erosion periods. Farmers have chosen some form of crop residue management on 75 percent of the highly erodible land in compliance plans. Working with the alliances, USDA provides technical information and assistance through demonstrations, direct mail, brochures, workshops, advertisements, and features in the farm-oriented media.

Conservation Reserve Program

The Conservation Reserve Program (CRP) offers farmers an incentive to remove highly erodible cropland and other environmentally sensitive land from production for at least ten years. Farmers who enroll in the program receive ten annual rental payments for idling the land and cost-share help in establishing a cover of grass or trees. Producers who plant hardwood trees or construct wildlife corridors, windbreaks, or shelterbelts may request contracts up to 15 years in length. As of August 1992, farmers had enrolled 36.5 million acres in the program, resulting in numerous environmental benefits. Average soil loss on CRP lands has declined to one-tenth of the former rate, from 21 to 2 tons per acre per year. Farmers are planting 2.4 million acres in trees; 31 million acres are in grass, predominantly in the prairie and Great Plains region; and another 2 million acres are in plantings beneficial to wildlife. In 1989 farmers entered 410,000 acres of farmed wetlands in the program. In the prairie pothole region of North and South Dakota, during one sign-up period alone, the program enrolled 150,000 acres of farmed wetlands. Under one program option, 13,000 acres of shallow-water wetlands are being restored. Eligibility now extends to saline lands and to cropland that contributes to water quality degradation. Incentives encourage the planting of hardwood trees in woodland, windbreaks, shelterbelts, and

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wildlife areas. A total of 23 U.S. watersheds, including the Chesapeake Bay and the Great Lakes, are designated Conservation Priority Areas and, as such, receive preference in program enrollments.

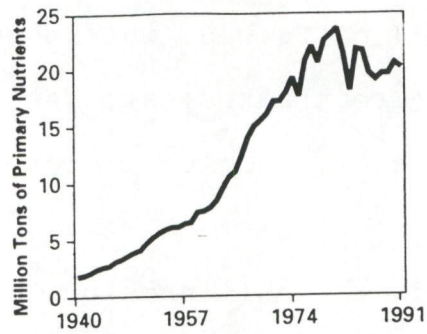
In addition to reducing soil erosion, CRP reduces pesticide use on land enrolled in the program by an estimated 30,000 tons annually and fertilizer use by an estimated 2.4 million tons annually. Because CRP may create an incentive to increase the intensity of fertilizer and pesticide use on remaining cropland, however, the net reduction in fertilizer and pesticide use may be smaller than these estimates suggest.

Swampbuster

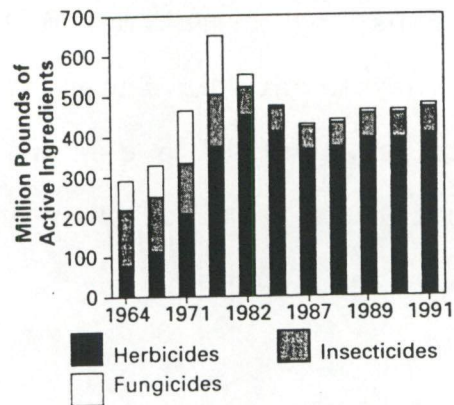
The 1985 Farm Bill took major steps to slow the loss of ecologically valuable wetlands in the United States. Producers who convert existing wetlands for crop production are disqualified from receiving USDA program benefits. The 1990 Farm Bill further refined wetlands provisions, making them easier to understand and enforce by changing the trigger for wetlands conversion from planting of an annual crop to the actual conversion of the wetlands. The legislation allows producers to mitigate wetlands loss through restoration of previously converted wetlands and also provides for graduated penalties. To date, the Soil Conservation Service has made 2 million determinations, delineating which areas are considered wetlands

Agricultural chemicals.

Fertilizer use.

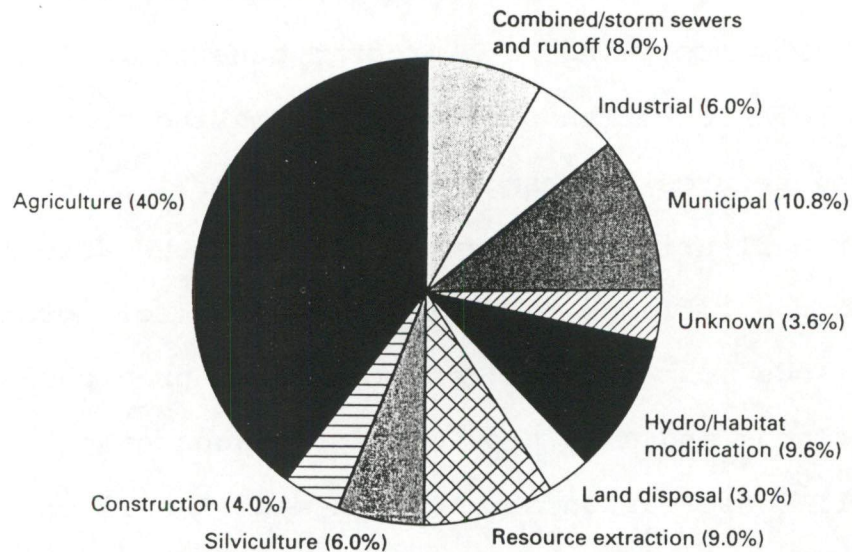


Pesticide use.



Source: See Part II, Table 53 and Table 54.

Sources of pollution in U.S. rivers.



Note: Based on river miles monitored in 1990, which represent 9.5 percent of total U.S. river miles.

Source: See Part II, Table 31.

To be updated.

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protected by the wetland conservation provisions of the 1985 Farm
Bill.

Wetlands Reserve Program

The Wetlands Reserve Program (WRP), created by the 1990 Farm Bill, is similar to CRP in that it offers landowners financial incentives to restore and protect wetlands on their property. Landowners who grant long-term easements to restore and maintain wetlands receive easement payments, technical assistance, and up to 75 percent of costs for work approved to restore the wetlands. Landowners are then responsible for protecting and maintaining wetlands within the boundaries of the easement. WRP does not allow cropping or other alterations harmful to wetlands.

The Bush administration proposed full funding for the Wetlands Reserve Program at nearly \$800 million through 1995 to restore and protect 1 million acres of wetlands. In fiscal 1992, with \$46 million appropriated to enroll 50,000 acres, WRP began as a pilot program in nine states. During a sign-up held in July 1992, landowners offered nearly 500,000 acres for enrollment in the pilot program.

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**Low-Impact Sustainable Agriculture
and Integrated Farm Management**

[text to come from USDA]

Water Quality Incentives

The Agricultural Water Quality Incentives Program provides payments and technical assistance to landowners who reduce the movement of contaminants from cropland to surface and subsurface waters. As part of this pilot effort, USDA conducts research to improve conservation technology. The Department has selected 16 demonstration areas to show how economically sound agricultural practices can improve water quality. During fiscal 1991 a total of 1,679 producers used such practices on 163,000 acres of cropland. For example, better nutrient management reduced the application of nitrogen to cropland by 675,000 pounds and phosphorous by 216,000 pounds.

In addition, USDA has selected 74 areas for intensive action against specific nonpoint contamination problems. In these areas, farmers apply both existing and newly developed conservation practices to eliminate water quality problems, including those that involve nitrogen, phosphorous, and pesticide use. In 1991 a total of 8,606 producers installed conservation practices on 390,000 acres of cropland with a resulting reduction of 1.8 million pounds of nitrogen and 1.5 million pounds of phosphorous. Cooperating agencies also assist with the improvement of pasture management in a number of these areas.

Windbreaks and Shelterbelts

Trees in windbreaks and shelterbelts protect agricultural crops, livestock, and rural farmsteads by reducing wind erosion, saving energy, and improving water quality. Assisted by federal, state, and local programs, farmers have established, to date, 200,000 miles of windbreaks and shelterbelts in the United States, with an annual increase of 3,500 miles.

Management System Evaluation Areas

A joint research initiative on Management System Evaluation Areas (MSEAs), begun in 1991 by the Agricultural Research Service and the Cooperative State Research Service, helps control and reduce the impacts of agricultural chemicals on water quality. The U.S. Geological Survey has contributed to the effort by conducting geohydrologic site characterizations and research on the transport of selected pesticides and nitrates into groundwater at five locations in the Midwest.

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Agriculture in Concert with the Environment

Agriculture in Concert with the Environment (ACE) is a grant program sponsored by the U.S. Department of Agriculture (USDA) and the Environmental Protection Agency (EPA) that funds research, education, and demonstration projects to foster environmentally sustainable agriculture. In 1992 ACE awarded \$2 million in grants for 27 projects. These ACE projects included the following objectives:

- Prevent groundwater pollution from nutrients and pesticides,
 - Prevent surface water pollution from livestock production operations, and
 - Promote non-chemical pest control.
-

AIR QUALITY

Also see Energy, International Issues, Transportation, and related tables and figures in Part II.

As a world leader in air pollution control, the United States is moving toward air quality goals through the use of advanced technologies and innovative policies. However, in some parts of the nation, air pollutants continue to threaten the environment and human health. The Clean Air Act Amendments of 1990, a major achievement for air quality protection, were designed to achieve goals in a more flexible and cost-effective manner than was traditionally the case in the past.

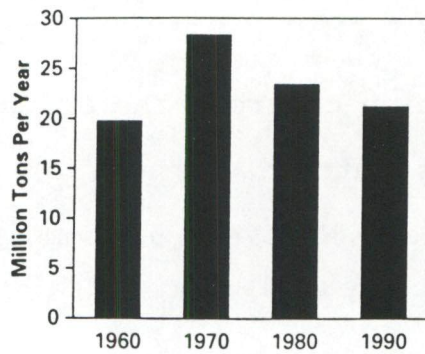
Conditions and Trends

The United States made substantial progress in improving air quality nationwide during the 1980s. Monitors showed reductions in levels of six common pollutants for which the U.S. Environmental Protection Agency (EPA) has set health-based national air quality standards.

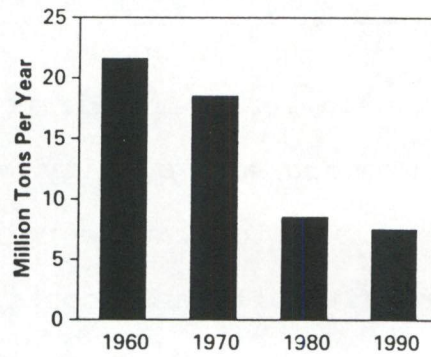
The biggest success story from 1982-1991 was an 89-percent reduction in lead levels in the air, resulting primarily from the removal of lead from most gasoline. In addition, the gradual phase-in of cleaner automobiles and powerplants caused atmospheric levels of carbon monoxide to fall by 30 percent, nitrogen oxides by 6 percent, ozone by 8 percent, and sulfur dioxide by 20 percent. Levels of fine particulate matter (PM-10, otherwise known as dust

U.S. air pollution trends.

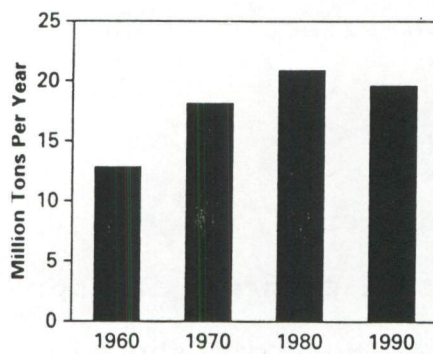
Sulfur dioxide emissions



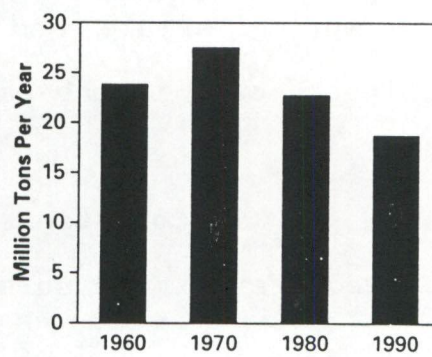
Total suspended particulates



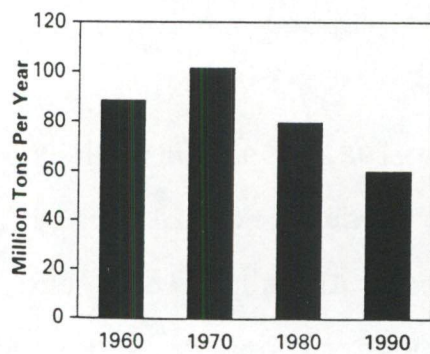
Nitrogen oxides emissions



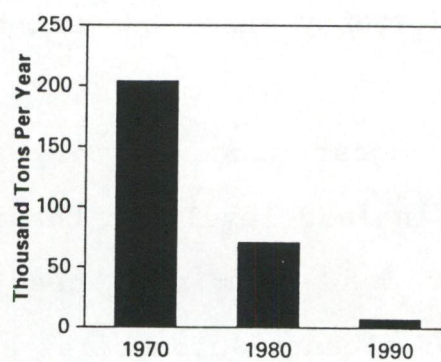
Volatile organic compounds



Carbon monoxide emissions



Lead emissions



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and soot) have dropped 10 percent since the PM-10 standard was set in 1987.

Despite this progress, 86 million people live in U.S. counties where pollution levels in 1991 exceeded at least one national air quality standard, based upon data for a single year. Urban smog continues to be the most prevalent problem; 70 million people live in U.S. counties where 1991 pollution levels exceeded the standard for ozone, the primary constituent of smog. Ozone pollution is formed from hydrocarbon and nitrogen oxide emissions, which come from motor vehicles and stationary pollution sources such as factories, powerplants, and certain consumer products. [Figure 1] Ozone can cause respiratory problems in sensitive individuals exposed for extended periods and also can damage forests and crops.

Carbon monoxide and particulates also exceed federal limits in many areas. Moreover, relatively large annual releases of sulfur dioxide and nitrogen oxides contribute to acid rain, visibility degradation, and health risks. Toxic pollutants --chemicals known or suspected to cause cancer or other serious health effects--are released into the air in many areas. The latest EPA Toxics Release Inventory shows a total of 2.2 billion pounds of air toxics released nationwide in 1990.

Global Atmospheric Pollution

Air pollution crosses international boundaries and rises miles above the Earth's surface. For example, chlorine concentrations

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in the upper atmosphere resulting from the release of chlorofluorocarbons (CFCs) and certain other chemicals have increased to a level that damages the Earth's ozone layer, which protects the planet from harmful doses of the sun's ultraviolet radiation. Another concern is possible climate change due to the accumulation of greenhouse gases that trap heat in the atmosphere. Emissions of greenhouse gases are still growing, but the rate of increase has slowed over the last twenty years. With direct and indirect controls established on greenhouse gas emissions in the last four years, emissions are expected to rise by as little as 1-2 percent during the 1990s.

Indoor Air Pollution

The population's general exposure to indoor air pollutants is increasing because of a variety of factors, including construction of more tightly sealed buildings, reduction of ventilation to save energy, use of synthetic building materials and furnishings, and use of chemically formulated personal care products, pesticides, and household cleaners. Indoor air pollutants include tobacco smoke, radon, volatile organic compounds, biological contaminants, combustion gases, respirable particulates, lead, formaldehyde, and asbestos. The extent of specific pollutants remains unquantified because of a limited scientific understanding of key exposure and risk-assessment issues.

A focus of concern is radon, a naturally occurring gas that

could be a leading cause of lung cancer in the United States. Although few homes have been tested (6 percent), federal and state environmental agencies have monitored elevated radon levels in some areas of every state.

Policies and Programs

Current U.S. policy on air quality is embodied in the Clean Air Act Amendments of 1990 (CAAA). Major international initiatives include the Framework Convention on Climate Change, the Montreal Protocol on Substances that Deplete the Ozone Layer, and the U.S./Canada Bilateral Agreement on Air Quality.

Clean Air Act Amendments

When fully implemented, CAAA will reduce air pollutant emissions by 56 billion pounds annually. The amendments mandated the following significant air quality improvements:

- Attainment of air quality standards nationwide by the year 2010;
- Reductions in pollutants that cause acid rain --chiefly sulfur dioxide from coal-burning powerplants--by approximately 45 percent below 1980 levels by the year 2000;
- Reductions of toxic air pollutants by at least 75 percent;
- Cleaner cars, fuels, factories, and

powerplants; and

- A phaseout of pollutants that threaten the stratospheric ozone layer.

Since passage of CAAA, EPA has proposed or finalized more than 80 rules and guidance documents that together will accomplish more than three-quarters of the emission reductions called for under the act. In an effort to prevent the kind of hostile litigation that has delayed environmental progress in the past, many rules were developed through regulatory negotiations and other forums in which industry, environmental groups, and state and local officials helped EPA develop a consensus. The resulting regulations, while fully enforceable, are generally more flexible and market-oriented than was often the case in the past.

Market-Based Acid Rain Control. A prime example of the CAAA's cost-effective, market-based methods is the acid rain control program, which employs a emission allowance system to reduce annual nationwide sulfur dioxide emissions to a level roughly 50 percent below the 1980 level. Under this program, the federal government will allocate emission allowances to electric utilities whose powerplants emit sulfur dioxide. Nationwide emissions will be capped at the lower level and individual utilities must stay within their allowance limits. If, however, a utility can cut its emissions more than required, it can sell its extra allowances to another utility, or bank them for future use. This creates an economic incentive to the utility to maximize its emissions

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reductions at the lowest possible cost.

Initially, concerns with the market-based approach existed on two fronts. Some questioned whether a market actually would develop for the emission allowances, while others feared a lack of correspondence between the location of emission reductions and sensitive regions on the receiving end. Concerns over market development lessened substantially in 1992 when the Chicago Board of Trade established an allowance market; the first major transaction occurred in May 1992 when Wisconsin Power and Light sold 10,000 emission allowances to the Tennessee Valley Authority. Concerns over the distribution of pollution reductions have lessened because the cap on emissions will force all utilities to phase out older, dirtier equipment over time. EPA has instituted a monitoring system to identify potential problem areas.

(Box and Screen)

NAPAP: Research to Evaluate Policy

The Clean Air Act Amendments of 1990 reauthorized the National Acid Precipitation Assessment Program (NAPAP) to answer two questions:

- What are the costs, benefits, and effectiveness of Title IV of the Clean Air Act, reducing acid rain; and
- What reductions in acid deposition are necessary to prevent adverse environmental effects?

NAPAP addresses these questions and identifies research gaps on an interagency basis by forming expert working groups. NAPAP currently emphasizes the following topics:

- Aquatic and terrestrial ecosystems,

- Human health,
 - Materials,
 - Visibility, and
 - Monitoring and modeling of precursor emissions and changes in acid deposition in urban and non-urban areas.
-

The following is a summary of other key CAAA rules that EPA has proposed or finalized to date.

Cleaner Gasoline. National limits on gasoline's volatility --its tendency to evaporate--already are reducing the release of hydrocarbons, which contribute to ozone smog. Starting in 1995 a new generation of cleaner, reformulated gasolines will reduce hydrocarbon and toxic emissions by at least 15 percent in the nine cities with the worst ozone pollution. A companion rule to increase the oxygen content of gasoline in 39 cities with carbon monoxide pollution will cut emissions by an estimated 20 percent in 1993.

Cleaner Cars and Trucks. Tighter emissions limits for cars and light trucks will be phased in starting with 1994 models, cutting exhaust hydrocarbons by 30 percent and nitrogen oxides by 60 percent relative to current standards. A new cold-temperature standard is expected to reduce wintertime carbon monoxide emissions by 20 percent. Smoke from diesel trucks and buses will be cut by proposed particulate standards and by new limits on sulfur in diesel fuel.

Vehicle Inspection and Maintenance. EPA will require improved vehicle emissions inspection programs in cities with serious ozone and carbon monoxide pollution. This rule requires vehicle owners to tune-up or repair high-polluting vehicles. High-tech inspection and proper maintenance will do more to reduce air pollution nationwide than any other single measure.

Cash for Clunkers. An estimated 20 percent of all vehicles on the road create more than 60 percent of auto-related air pollution. A proposed "cash for clunkers" program would allow states and industries to buy older, higher-polluting cars and trucks, retire them permanently, and use the resulting pollutant reductions to help satisfy federal clean air requirements. Several states, companies, and organizations have conducted pilot tests of the program in California, Illinois, and Delaware.

Fleet Vehicles. Beginning in 1998 in 22 cities, EPA will require new fleet vehicles, such as taxis and delivery vans, to meet tailpipe standards more stringent than those required for conventional vehicles. EPA guidelines will provide incentives for fleet owners to purchase ultra-clean vehicles fueled with natural gas, propane, pure alcohol, or electricity.

Offshore Oil Facilities. Offshore oil and gas platforms within 25 miles of a state's seaward boundary will be subject to the same air pollution control requirements as onshore facilities.

Incinerators and Landfills. New standards for municipal waste incinerators will result in a 90-percent reduction in emissions of

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metals, organic chemicals, and acid gases. Proposed standards for large, solid waste landfills, as well as hazardous waste treatment and disposal facilities, would cut toxic and smog-forming emissions. The landfill standards also would cut releases of methane, a greenhouse gas.

Permits. To facilitate enforcement of the amendments, states will develop comprehensive permit programs for air pollution sources.

Hazardous Organics Rule. New standards cover emissions from such diverse sources as storage tanks, transfer operations, and wastewater treatment plants. As a result, toxic air pollutants will fall by 1 million pounds per year, and volatile organic compound emissions by 2 billion pounds per year.

Air Quality in National Parks. CAAA also provided a renewed focus on air quality and visibility in pristine areas, such as national parks. Many national parks are affected by pollution haze which can degrade scenic vistas for park visitors. Building on a 1991 agreement to cut utility emissions near Grand Canyon National Park, in 1992 the Grand Canyon National Visibility Transport Commission began an assessment of visibility conditions at several additional parks and wilderness areas in the West. Recommendations on measures needed to protect these and other scenic resources will be presented to EPA in 1995. Special efforts have been made to involve the public in the Commission's activities.

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Clean Air Act Business Opportunities

Complying with the Clean Air Act Amendments will be costly for some industries and businesses. However, the amendments also create business opportunities and economic benefits.

A study commissioned by the Environmental Protection Agency (EPA) projected that annual revenues to the air pollution control industry will grow by as much as \$9 billion by 1996, with average annual growth of approximately 10 percent. Thousands of jobs will be created in the manufacture of air pollution control equipment. Enhanced vehicle inspection rules will generate jobs for inspectors, auto mechanics, and auto parts manufacturers. EPA also anticipates job creation in such diverse fields as low-sulfur coal mining, chemical engineering for reformulated products, and manufacture of fuel additives and clean fuels such as natural gas and ethanol.

Stratospheric Ozone Layer

To slow and eventually reverse ozone layer depletion, the United States signed the 1987 Montreal Protocol and the 1990 London amendments, which call for rapid elimination of the chemicals that are damaging the ozone layer. In 1989 the United States imposed an excise fee on the production of chlorofluorocarbons (CFCs), and in 1990, the Clean Air Act Amendments required ozone-depleting substances to be phased out by the year 2000.

In February 1992, acting on scientific evidence that ozone depletion is occurring more rapidly and widely than previously believed, President Bush accelerated the U.S. phaseout deadline for CFCs to the end of 1995, four years ahead of the Montreal Protocol

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deadline. To accelerate progress in the near term, the President
asked U.S. producers to cut 1992 output to one-half of 1986 levels,
and he called on other nations to match the U.S. commitment.
Currently the United States is more than 40 percent ahead of the
international CFC phaseout schedule and has a world lead in
developing safer substitutes.

Greenhouse Gases

In June 1992 the United States signed the Framework Convention
on Climate Change, a binding treaty designed to promote continuing
domestic and international actions to address climate change. The
U.S. Senate agreed to the convention in October 1992, making the
United States the first industrialized nation to ratify the treaty.
The U.S. Government has established a national climate action plan
that includes the following elements:

- Measures to reduce greenhouse gases directly
and indirectly and to enhance greenhouse gas
sinks, such as forests;
- Development of new technologies to improve
energy efficiency and reduce emissions; and
- The world's most extensive program of climate
change research to better understand changes
in the Earth's systems and develop appropriate
responses.

Actions included in this comprehensive plan will reduce

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greenhouse gas emissions by an estimated 7-11 percent below levels
otherwise projected for the year 2000. For more information about
climate change policy, see the International Section.

(Box and screen)

Clean Air and Transportation Policy

The National Transportation Policy, issued by the Department of Transportation (DOT) in 1990, calls for reduction of transportation-related air pollution. Under the Clean Air Act Amendments and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), EPA and DOT are collaborating on ways to meet air quality goals. Funding made available under ISTEA supports monitoring of transportation-related environmental impacts and achievement of clean air standards.

In 1992 the U.S. Maritime Administration and Coast Guard began a multi-year project to measure and reduce air polluting emissions from engines on marine vessels.

Indoor Air Pollution

Within the U.S. government, 20 federal agencies have responsibilities associated with indoor air quality, either through statutory responsibilities or because they are major property managers. An interagency Committee on Indoor Air Quality (CIAQ) coordinates these activities and includes members from EPA, the Consumer Product Safety Commission, the Department of Energy, the National Institute for Occupational Safety and Health, and the Occupational Safety and Health Administration.

The federal government administers indoor air programs under the authority contained in several statutes. For example, Title IV of the Superfund Amendments and Reauthorization Act (SARA)

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requires EPA to conduct research and disseminate information. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA) authorize EPA to regulate products that adversely affect indoor air quality.

Federal programs conduct research and disseminate information on the following indoor air quality topics:

- Health effects,
- Building design and control techniques,
- Development of non-regulatory guidance on indoor air quality issues,
- Chemical screening to prohibit or restrict potentially harmful products,
- Radon testing, and
- Educational and outreach programs on health risks and prevention practices.

[box and screen]

The Urban Heat Island Effect and Smog

In urban areas, the mass of buildings, heat from cars and machinery, black asphalt of roads, and sparse tree cover combine to raise temperatures and slowly release heat back into the atmosphere. During the afternoon, city temperatures can be 6 degrees hotter than surrounding countryside. At night, city streets continue to radiate heat, keeping city temperatures 10 to 15 degrees warmer than the country. Studies have shown that this "urban heat island effect" aggravates air pollution by increasing peak energy demand for air conditioning. The following strategies can help reverse the impact of the "urban heat island effect," and in so doing, cut energy bills and reduce air pollution:

- Select light colors for building exteriors and roofs to reflect rather than absorb sunlight,
- Use concrete or light-colored aggregate in asphalt for roads,
- Plant trees next to buildings to shade roofs, and shrubs to shade walls and windows,
- Shade exterior central air conditioning units to improve efficiency,
- Include natural shading in building energy codes,
- Plant trees to shade parking lots.

The Department of Energy, Environmental Protection Agency, USDA Forest Service, and American Forestry Association are cosponsoring a 2-year study to evaluate urban heat island effects and shade-related issues in 12 demonstration cities.

[place graphic here]

BIODIVERSITY

Also see Forestry, International Issues, Private Sector Initiatives, and related tables and figures in Part II.

Biodiversity has been defined as the variety and variability of life--the diversity of genes, species, and ecosystems--but it is the interactions between these living components that are of primary concern. Diversity is essential for full ecological functioning. For example, genetic diversity better enables a species to survive changing conditions. Variation among species is the key to such basic ecological concepts as the food web. The rich variety of plant and animal species that exists on Earth is ultimately the source of much of the world's food, clothing, and shelter, and biological systems continually recycle air, water, and land. Humanity disrupts biodiversity at the risk of limiting its options and quality of life both now and in the future.

Conditions and Trends

Along with other nations, the United States lacks full and accurate information on the status and distribution of biodiversity components and the functioning of ecosystems. Available information and trend monitoring often focus on

particular species, but a recognition is emerging regarding the value of status and trend data on ecosystems, communities, and habitat, as well as the need for better information on genetic diversity. Even for species of current concern (such as those that are declining or near extinction or have special value for commerce or recreation), information is incomplete, and for thousands of species and plant and animal communities, existing status and trend information is often anecdotal and sketchy. Although numerous sources of information are available, the following elements are lacking:

- A coordinated biodiversity data reporting or assessment effort;
- An overall scientific consensus on which statistics are most useful as biodiversity indicators and on which procedures are most useful in comparing and managing biodiversity data.

[box with screen]

U.S. Biodiversity: Trends in Key Species

Biodiversity monitoring data is available for a number of key species. Species data often is collected on an annual basis, whereas changes in ecosystem status generally are not. Recent CEQ annual reports addressed changes in ecosystem diversity, such as loss of tallgrass prairie, old-growth forest, and wetlands. Additional critical biodiversity issues include concerns over the effect of the widespread use of hatchery fish on the genetic diversity of wild fish.

Endangered Species. As of June 30, 1992, the Fish and Wildlife Service (FWS) classified an additional 89 domestic species as threatened or endangered, for a total of 727 U.S. listed species [REVISE AT END-OF-

YEAR. CONTACT: DAVE HARRELSON 703-358-2171]. The Threatened and Endangered Species Lists, including foreign species, have 1,257 species, and 3,700 species are candidates. The most recent (1990) assessment of recovery status for listed species revealed 38 percent declining, 10 percent improving, 31 percent stable, 2 percent extinct, and 19 percent of unknown status.

[CHART/TABLE]

Ducks and Geese. Although estimated numbers of ducks migrating south in 1992 remained stable or showed an increase over recent years, the numbers are below long-term averages. By population estimates, 1992 was the sixth lowest year on record, even though breeding populations of three duck species showed a significant increase over 1991 figures, and populations were relatively stable for ten principal species. Estimates of goose populations, based on less rigorous information than for ducks, indicate that despite recent declines, most goose populations are at or above objective levels. An exception is Atlantic flyway Canada geese, which declined to their lowest level in 23 years.

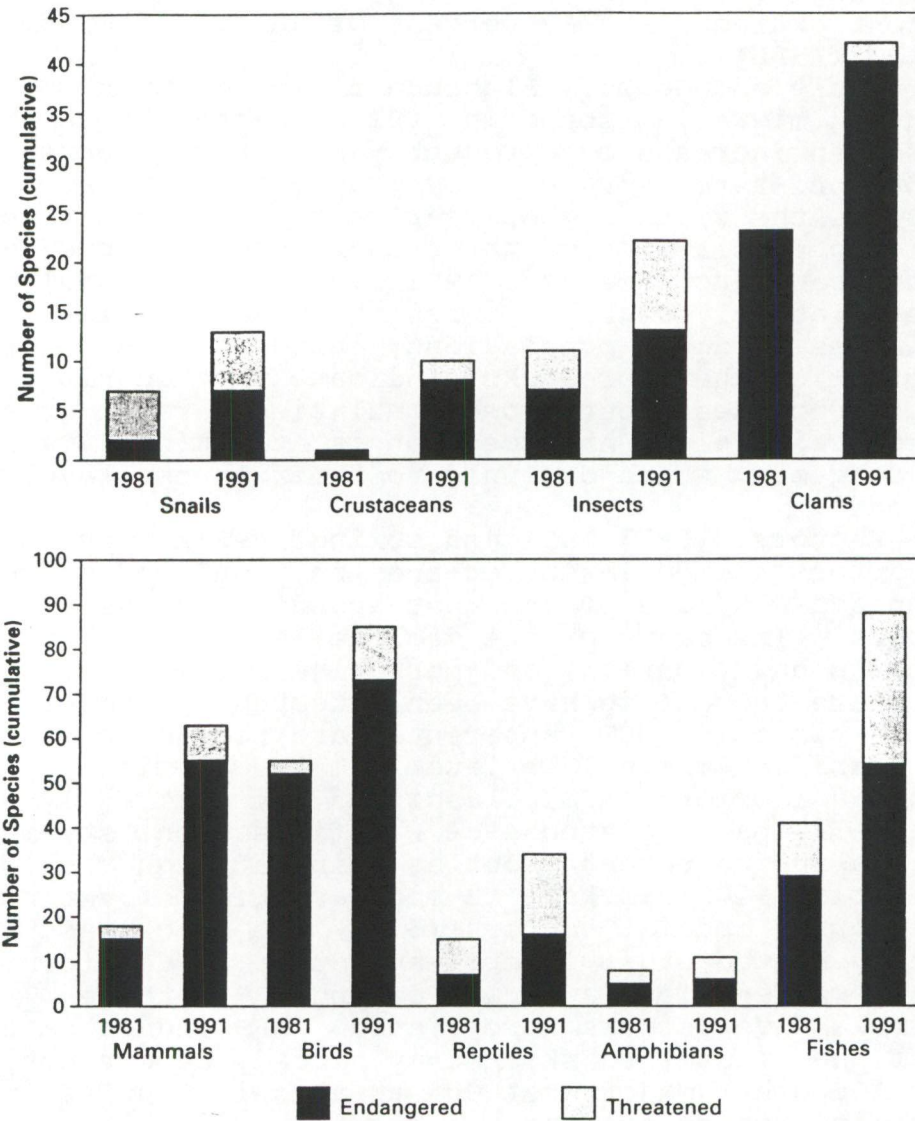
Raptors. Fall 1991 and spring 1992 surveys of raptors showed large declines in counts of sharp-shinned hawks, one of the most abundant of the eastern raptors. The cause of the decline is unknown. Osprey, Cooper's hawk, merlin, and peregrine falcon--several of which are thought to have been affected by the now-banned pesticide DDT--apparently are recovering.

Pacific Salmon. In late 1991 the American Fisheries Society (AFS) classified 214 native, naturally spawning stocks of Pacific salmon, steelhead, and sea-run cutthroat trout as being at high risk of extinction (101 stocks), at moderate risk of extinction (58), or of special concern (54). One stock was already listed under federal and State of California endangered species laws, and during 1992, three Columbia River stocks were listed. AFS indicated that 18 of the classified stocks may already be extinct, and that 106 other major West Coast salmonid populations have also become extinct.

Policies And Programs

In 1992 federal agencies, Congress, the states, and private U.S. organizations joined in efforts to sustain domestic and

Threatened and endangered species in the United States.



Source: See Part II, Table 80.

To be updated.

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global biodiversity. A sampling of policies and programs
follows.

National Center for Biodiversity Information

In June 1992 the Bush administration announced its intent to establish a domestic center for biodiversity information. Interagency efforts are underway to develop such a center, whose basic functions would include the following:

Improving Access to Information. The center would serve as a mechanism to locate and provide access to biodiversity information in public and private institutions, thus ensuring that development and conservation decisions are informed fully and efficiently.

Assessing Biodiversity Information. The center would survey current information and efforts to augment existing biodiversity data, thus identifying gaps and duplicated efforts.

Improving and Standardizing Methodologies. The center would work toward standard methods for data collection, reporting, and management, thus improving the comparability and utility of information.

Convention on Biological Diversity

In 1992 two years of intensive international negotiations concluded with a convention on biological diversity signed by 153 nations at the United Nations Conference on Environment and

Development (UNCED), held in Rio de Janeiro, Brazil. The convention requires measures to identify biological resources in decline, reasons for such declines, and on-site and off-site measures to address the declines.

Although the United States participated actively in negotiations and hoped to be a signatory, the convention included several provisions, unrelated to the conservation sections of the treaty, that were unacceptable to the United States. These provisions concerned protections granted to intellectual property rights, access to genetic information used in biotechnology, and international funding for biodiversity activities. As a result, the United States declined to sign the treaty in its present form. At the Rio meeting, however, President Bush stated that U.S. actions to conserve domestic biodiversity would exceed requirements of the treaty.

Inventory and Research Proposal

At UNCED, the United States offered a proposal to foster international scientific cooperation on biodiversity surveys, inventories, and data management, with the goal of increasing the availability, comparability, and quality of information on biological diversity. The United States plans to host a meeting in early 1993 of international experts to consider such topics as data gathering and reporting standards, approaches to conducting inventories and surveys, data management techniques, and

institutional issues related to national biodiversity surveys.

[box with screen]

Linking Ecosystems and Biodiversity

In June 1992 the Bureau of Land Management (BLM) in the Department of the Interior and the USDA Forest Service jointly adopted a new philosophy on ecosystem management. The program has three principal elements:

- Managing lands and waters to restore and sustain biodiversity and productivity of renewable natural resources;
- Developing conservation partnerships and improving the participation of citizens in public resource decisionmaking; and
- Bringing the scientific community into stronger partnerships with land managers.

This ecological management approach has the following basic principles:

- Protecting or restoring the integrity of soils, air, water, biodiversity, and ecological processes;
- Meeting the basic needs of people and communities who depend upon the land for food, fuel, shelter, livelihood, recreation, and spiritual renewal;
- Promoting efficiency by ensuring cost-effective production of natural resources; and
- Working to meet the needs of a variety of interests, regions, and generations in land-use decisionmaking.

In 1992 the departments of Agriculture and the Interior also issued a report entitled "America's Biodiversity Strategy: Actions to Conserve Species and Habitat." The report discusses the framework for managing species and protected areas that has evolved over the past 100 years.

BLM has developed a proposal for managing 2.5 million acres of federal land in western Oregon, incorporating biodiversity and sustainable development. An environmental impact statement released in August 1992 by BLM contains an analysis of the proposal.

Public land managers, scientists, and the public have begun to apply general ecological concepts to the specific situations encountered in each ecosystem and region of the country.

Gap Analysis

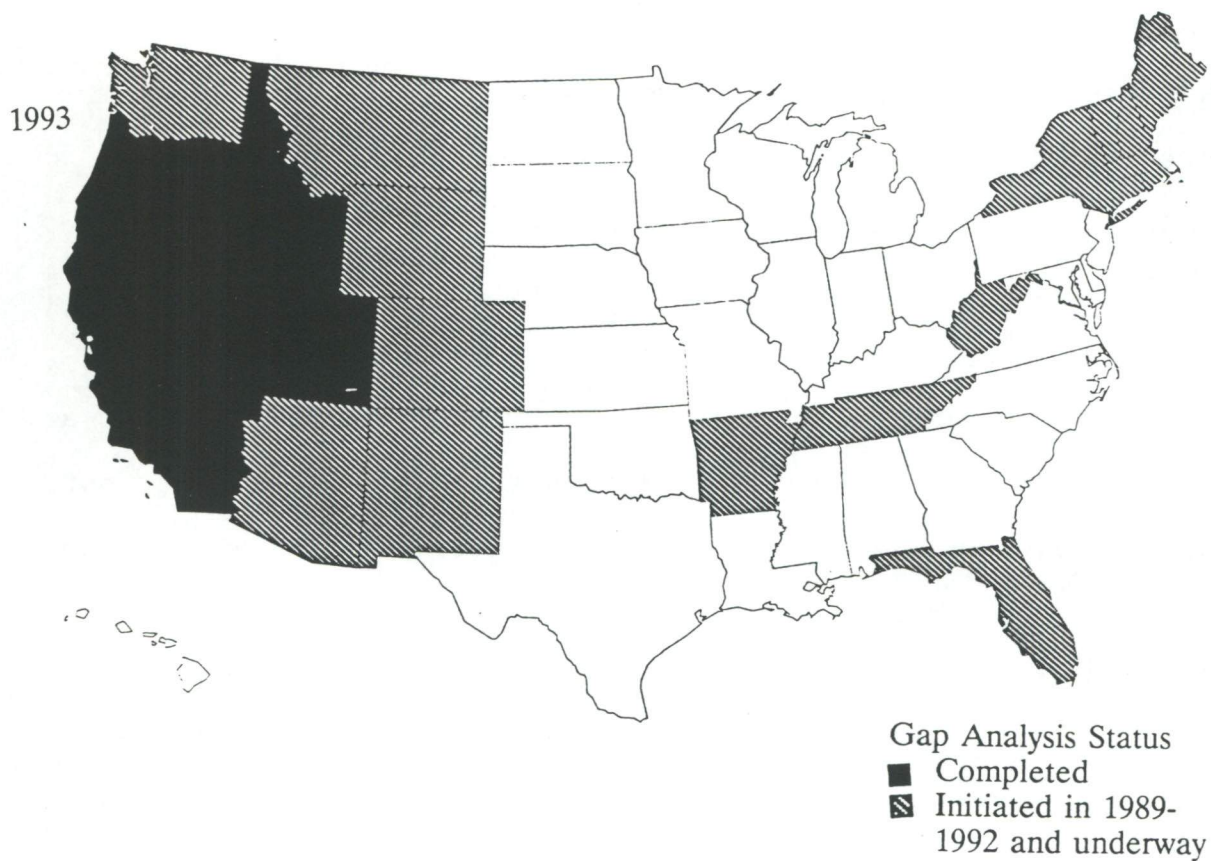
Fish and Wildlife Service researchers use satellite imagery, habitat data, and geographic information systems to compare the distribution of species and plant/animal communities with existing land ownership and land management patterns. From this analysis, they can determine the extent of current protection and identify areas in need of improved management. In 1992 federal, state, and private organizations worked on gap analysis projects in 22 states. Nationwide coverage is planned.

Endangered Species Protection

Biodiversity conservation includes efforts to preserve the diversity of species and the ecosystems on which they depend. Foremost among such U.S. efforts is the Endangered Species Act (ESA), whose initial stated purpose is "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved." Despite this broad mandate, most implementation efforts focus on protecting individual species in danger of extinction (endangered) or likely to become so in the foreseeable future (threatened).

The federal agencies that implement ESA--Fish and Wildlife Service (FWS) for terrestrial species and National Marine Fisheries Service (NMFS) for marine species and anadromous fisheries--have begun to increase the use of regional and multi-species, habitat-based approaches. For example, FWS emphasizes

[Figure, map]
Gap analysis by state.



Source: U.S. Department of the Interior, Fish and Wildlife Service, 1992.

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additions to threatened and endangered species lists that cover multiple species in a given region, so that conservation efforts can address their various needs more efficiently. FWS also supports multi-species recovery actions.

ESA allows the taking of listed species--defining "take" to include "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage"--if the activity is incidental to an otherwise legal activity and upon approval of a habitat conservation plan demonstrating that the taking will not appreciably reduce the likelihood of survival or recovery. Such plans often cover a significant portion of the habitat for a species and thus have the potential to provide protection for a range of species and plant/animal communities. As of October 1992 FWS and NMFS had issued 20 incidental-take permits and 17 permit amendments. FWS staff had provided pre-application technical assistance on 52 habitat conservation plans.

In 1992 the BLM director invoked a section of ESA that allows a cabinet-level committee to authorize a project that would jeopardize a species. The Endangered Species Committee convened in late 1991 and in February 1992 reached a decision to allow some of a number of disputed timber sales to proceed. (For more information, see the Forestry section.)

Natural Community Conservation Planning

In 1992 the State of California continued an innovative

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program of Natural Community Conservation Planning (NCCP) to anticipate and prevent controversies resulting from listing of species under federal or state endangered species laws. The goal is to protect entire ecosystems while allowing compatible economic development. The program works through voluntary, permanent, enforceable conservation strategies that address specific habitats and species, setting out protected areas and areas appropriate for development.

A pilot program is underway to address coastal sage scrub, a habitat type supporting several potentially endangered or threatened species, including the California gnatcatcher. Private landowners have agreed to forestall development on 141,000 acres, some of which contains coastal sage scrub, for an 18-month period, while final conservation plans are developed. During this period, public land-use and regulatory agencies will increase their discretionary review of projects on 1.1 million acres, containing 210,000 acres or 53 percent of the identified sage scrub habitat. Development of the conservation plans involves landowners, local governments, and state and federal wildlife agencies.

California Bioregions

The State of California, in cooperation with federal agencies, began a groundbreaking effort in 1991 to reorient existing environmental and natural resource management efforts

around natural ecological regions or bioregions. The first major activity of the effort was a report released in 1992 on the Sierra bioregion. The Sierra Report, based on a broad public outreach effort, contained 18 recommendations for increasing the understanding of the effects of human activities on the bioregion. It involved local communities in decisionmaking and recognized the linkage between environmental and economic concerns.

Every Species Counts

The USDA Forest Service has adopted landscape and ecosystem approaches to managing habitat for 230 threatened or endangered species. In 1992 the agency surveyed 1 million acres for threatened, endangered, and sensitive species (a Forest Service designation). The agency is preparing species management guides for the 50 states, in conjunction with such groups as The Nature Conservancy, which assist with inventory, data management, and development of conservation strategies. Examples of activities during 1992 follow.

- Release of two captive-bred California condors and two Andean condors into historic condor habitat in California;
- Placement of 450 nest boxes for the hurricane-ravaged red-cockaded woodpecker in South Carolina national forests, which contributed to a 9-percent increase in

woodpecker populations;

- Careful use of fire to restore specialized forest ecosystems, such as southern pine stands that host red-cockaded woodpeckers, tallgrass prairie in Illinois, and mountain golden heather in North Carolina; and
- Development in the Southwest of management guidelines for the northern goshawk that adopt an ecosystem approach, thus benefitting other species as well.

Bring Back the Natives!

In 1992 the Forest Service, BLM, and the National Fish and Wildlife Foundation (a Congressionally chartered nonprofit organization) cooperated on 18 Bring Back the Natives projects. This national effort attempts to restore the health of entire stream systems and their native aquatic species, including fish, mollusks, and plants. On public lands, restoration of entire watersheds can make a critical difference in the recovery and conservation of vulnerable species.

Pacific Salmon and Steelhead Conservation

In 1992 the USDA Forest Service initiated a strategy to provide an ecological approach to managing salmon and steelhead habitat in western national forests. The strategy will identify and implement measures that contribute to the sustained natural production of salmon and steelhead stocks, possibly precluding

the need for listing under the Endangered Species Act. The Forest Service is coordinating development and implementation of the strategy with other fish management agencies and conservation groups.

Biodiversity and NEPA

In 1992 CEQ, with support from EPA and the departments of Defense, Interior, Transportation, and Agriculture, completed a series of conferences on ways to incorporate biodiversity and ecosystem management into analyses prepared under the National Environmental Policy Act (NEPA). A CEQ report will outline recommendations for accomplishing this objective.

Biodiversity on Private Lands

Since the majority of lands in the United States are in private ownership, any national strategy to conserve biodiversity must find ways to encourage conservation actions by private landowners. In 1992 the President's Commission on Environmental Quality (PCEQ) undertook an initiative to develop best practices for integrating biodiversity considerations into private land management decisionmaking. The initiative involves case studies of 16 demonstration projects proposed by private firms, ranging from 100 acres on a suburban Philadelphia corporate campus to 280,000 acres of a forested and mixed-use watershed on the coast of Washington state. A PCEQ report will present case studies and

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best-practice recommendations along with outreach materials that offer guidance for private landowners.

International Trade in Endangered Species

The eighth conference of the parties to the Convention on International Trade in Endangered Species (CITES) took place in Japan in March 1992. Delegates agreed to continue the African elephant's listing on Appendix I, which bans all trade in ivory. They discussed the listing of commodity species such as blue fin tuna and several tropical timber species, including varieties of mahogany, and agreed to reevaluate the scientific criteria for CITES listing.

In 1992 Congress enacted new legislation to facilitate U.S. implementation of decisions and resolutions under CITES with regard to exotic birds. The new legislation authorizes regulation of imports of exotic wild birds, whose populations may be adversely affected by trade. It also authorizes the Secretary of the Interior to support wild bird management efforts in other nations.

Caribbean Regional Treaty

In 1992 the Bush administration sent to Congress for advice and consent the Protocol Concerning Specially Protected Areas and Wildlife. This protocol builds upon general obligations outlined in the Convention for the Protection and Development of the

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Marine Environment of the Wider Caribbean Region, which calls upon signatories to establish protected areas to conserve rare or fragile ecosystems as well as habitats for threatened and endangered species.

Neotropical Migratory Birds

Partners in Flight/Aves de las Americas is a cooperative program that involves state, federal, and international agencies and conservation organizations. It is the first integrated program for research, monitoring, and habitat management for migratory birds--neotropical migrants--that breed in North America and migrate to Latin and South America during the northern winter. In 1992 the program sponsored a national workshop on the status of such birds as the indigo bunting, scarlet tanager, and many species of warblers and the effect of land-use practices on their long-term survival. Initiatives focused on bird population management, habitat monitoring, habitat improvement, training, and public education.

Marine Sanctuaries

The NOAA National Marine Sanctuary Program aims to conserve and protect habitats and associated biological communities necessary to sustain living marine resources. It also provides opportunities for research. In 1992 Monterey Bay off the central California coast and the Florida Garden Banks off the Texas-

Louisiana border were added to the National Marine Sanctuary system. These additions brought the number of marine sanctuaries to 11 and more than doubled the size of the system.

Estuarine Research Reserves

The goal of the National Estuarine Research Reserves Program is to establish and manage a system of estuarine research areas representative of the various U.S. biogeographical regions and estuarine types. In 1992 two new reserves were designated: Ashepoo-Combahee-Edisto (ACE) Basin and North Inlet/Winyah Bay, both [??] in South Carolina, bringing the number of reserves to 19.

Research Natural Areas

Research natural areas (RNA) are areas of forest, range, aquatic, geologic, alpine, shrubland, and grassland vegetation set aside for nonmanipulative research, study, monitoring, and education. In 1992 the Forest Service reviewed 300 sites for addition to the system. Established in 1927, the RNA program now encompasses 290 sites and 250,000 acres.

Biosphere Reserves

Biosphere reserves provide a framework for regional and international cooperation in biodiversity conservation and research. The U.N./U.S. Man and the Biosphere Program (MAB) has

initiated interdisciplinary research on ecosystem sustainability in biosphere reserves in New Jersey, Virginia, and Florida. In 1992 UNESCO designated The Land Between the Lakes, a demonstration area for integrated management in Kentucky and Tennessee administered by the Tennessee Valley Authority, as the forty-seventh U.S. biosphere reserve. A Biosphere Reserves Integrated Monitoring Program (BRIM), launched under the auspices of EuroMAB, is promoting cooperation among European and North American biosphere reserves. Among the first BRIM efforts is documentation of biodiversity in the reserves.

Biodiversity Education

Federal agencies have undertaken a number of initiatives to inform the public and to train professional staffs on the principles of biodiversity conservation.

National Park Service. NPS has launched a national program to promote public awareness of biodiversity management issues and the value of biodiversity to human societies. In 1992 efforts included a comprehensive manual for interpreters and a range of media used in educational programs at many national parks and monuments.

Forest Service. The Forest Service Natural Resource Conservation Education program supports lifelong learning about natural resources and ecosystems, their interrelationships, conservation, use, management, and value to society. In 1992,

the program's first full year, the Forest Service committed \$2.5 million to 150 education projects. Among them were the following: development of curricula for elementary and secondary schools; use of national forests and grasslands as living classrooms; support for individual teachers; events promoting environmental awareness; and development of local and state-wide strategic plans for conservation education. Through partnerships with other federal, state, and local agencies, schools, and private industry, the Forest Service was able to double funding for biodiversity education.

Bureau of Land Management. BLM, along with other federal agencies, held the first session of a field training course that applies principles of ecosystem management to field activities to conserve biodiversity.

Biodiversity Symposium

In July 1992 the USDA Forest Service held an international symposium, "Biodiversity in Managed Landscapes: Theory and Practice," in Sacramento, California. Cosponsors included public and private organizations, with a number of federal agencies. The symposium, attended by 400 people from 12 countries, had the following objectives:

- Document case examples of biodiversity theory and concepts applied at differing scales, such as local, national, and global;

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- Examine policies that affect biodiversity conservation;
- Emphasize that the conservation of biodiversity requires more than a network of protected areas and preserves; and
- Provide a forum for dialogue and interchange that will lead to increased understanding and cooperation.

COASTS AND OCEANS

Also see Fisheries and Marine Mammals, International Issues, Wetlands, and related tables in Part II.

Coasts and oceans contribute significantly to the U.S. economy and to the nation's competitiveness and to the quality of life of U.S. citizens. Americans pursuing a variety of interests seek to protect the coastal zone for a variety of reasons: aesthetic and recreational offerings, critical ecological functions such as protection from flood and storm damage and preservation of water quality, and important economic activities such as fishing, tourism, and commerce.

Conditions and Trends

The vast reaches of the oceans are relatively clean and healthy due primarily to their enormous volume and capacity for dilution. However, the edges of the oceans, the coastal oceans, are subject to a disproportionate share of the disruptive impacts of human endeavors. These include the consumption of resources, disposal of wastes, and alteration of shores for social and economic benefits. A 1990 assessment by the Environmental Protection Agency (EPA) of 26,693 estuarine coastline miles and 4,320 ocean coastline miles revealed that only 56 percent of estuarine waters fully support designated uses such as swimming and fishing, while 89 percent of ocean coastline fully supported designated uses. Only two percent of Great Lakes coasts assessed in the study were found to support their designated uses.

Population

As defined by the National Oceanic and Atmospheric Administration (NOAA), the U.S. coastal zone is comprised of the 666 coastal counties, cities, boroughs, or other county equivalents within 50 miles of ocean, bay, sound, or Great Lakes coasts. Excluding Alaska, U.S. coastal counties support nearly half of the nation's population while accounting for only 11 percent of the land mass. NOAA studies anticipate a 15-percent increase in coastal population over the next two decades, concentrated in California, Florida, and Texas. Coastal population density increased from 248 people per square mile in 1960 to 341 in 1988, more than four times the national average.

Multiple Use

Coasts, oceans and their associated resources are sought after by a variety of interests for a variety of uses: commercial fishing; marine transportation; oil and gas and other extractive activities; recreation; residential; governments at all levels; Native American tribes; and the general public. The multiple use nature of the coastal zone, combined with increasing population density, indicates the zone's high economic value and contribution to the quality of life. At the same time, however, the multitude of uses also serves to concentrate pressure on coastal resources and processes.

Coastal recreation alone represents significant expenditures: recreational fishermen spend an estimated \$6.2 billion yearly (1985), and recreational boaters spent \$17.1

billion in 1989. An estimated 94 million people participate annually in coastal boating and fishing.

Coastal Pollution

Pollution stress results from activities both in or adjacent to coastal waters. Oil spills and waste discharges from boats, industrial facilities, and municipal wastewater treatment plants are direct sources of pollution. Activities throughout watersheds which drain to coastal waters provide indirect sources of pollution in the form of point source discharges into rivers and non-point sources such as runoff from agricultural or urban areas carrying nutrients, chemical pesticides and herbicides, and increased sediment loads due to development activities.

Coastal pollution has its greatest impacts on recreational, fish and shellfish, and wildlife habitat values. Coastal recreationists in many areas continue to be confronted with beach closures because of unsafe levels of fecal coliform bacteria or marine debris. Other problems include fish and shellfish consumption advisories, shellfish bed closures, and diminished aesthetic quality. The viability of 75 percent of the nation's commercial fisheries depends on clean and functioning estuaries. Pollution and physical alteration may render coastal habitats incapable of providing elements critical to the life cycles of many fish and shellfish.

Coastal Hazards

As coastal development continues to increase, so do the potential threats to life, property, and natural resources

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resulting from coastal hazards -- both natural and human induced. Flooding, high winds, tsunamis, coastal erosion, sea level rise, and storm surges associated with hurricanes and typhoons are all of concern to coastal managers, planners, and residents. The need to protect natural features such as wetlands, mangroves, dunes, and coastal barrier islands is clear every time the nation experiences the destructive forces of hurricanes such as Hugo (South Carolina, 1989), Andrew (south Florida, August 1992), and Iniki (Kauai, Hawaii August 1992).

Improvements in the ability to predict the severity and landfall of coastal storms have resulted in far fewer injuries and deaths resulting from these events. However, even as storm-related mortality decreases, the costs of storm damage to heavily developed and rapidly developing coastal areas increases. Initial estimates of the damage from Hurricane Andrew are \$15-30 billion, making it the most expensive natural disaster in U.S. history.

Programs and Policies

Several federal agencies share responsibility for coastal and ocean issues. NOAA and the Fish and Wildlife Service (FWS) are responsible for stewardship of living marine resources. NOAA, EPA, FWS, the Minerals Management Service (MMS), the National Science Foundation (NSF) and the Navy are all active in pursuing marine-related scientific research. Navigational safety and national security are covered by NOAA, the Army Corps of Engineers, the Navy, and the Coast Guard, while offshore minerals development is primarily the responsibility of MMS. EPA is the

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lead agency responsible for the regulation of pollution sources, with NOAA and the Coast Guard also involved in addressing coastal marine pollution.

Planning and Management

The Coastal Zone Management Program, authorized by the Coastal Zone Management Act (CZMA) and administered primarily by NOAA, is a Federal-State partnership in which states with federally approved Coastal Zone Management (CZM) plans are eligible for federal grants and technical assistance for managing their coastal resources. Presently 29 of the 35 U.S. coastal states and territories have approved CZM programs covering 94 percent of the U.S. coastline (84,117 miles). Texas, Ohio, Minnesota and Georgia are in the process of developing CZM programs. Presently, the Great Lakes states of Illinois and Indiana do not participate in the Coastal Zone Management Program. In 1992, the majority of participating states prepared assessments and strategies to address priority coastal enhancement in areas that include natural hazards, shoreline access, wetlands, marine debris, ocean resources, special area management planning, government facility siting, and cumulative and secondary impacts of development.

Nonpoint Source Pollution. The CZMA amendments of 1990 require participating coastal states to develop Coastal Nonpoint Pollution Control Programs subject to approval by NOAA and EPA. Nonpoint sources are now believed to contribute more to water quality degradation than point sources. Over the past two decades point sources, which are easier to identify and control,

have been the focus of the majority of anti-pollution programs. Future improvements in water quality will require major reductions in nonpoint pollution. The proposed nonpoint pollution program will focus on six major categories of nonpoint sources that impair or threaten coastal waters nationally: agricultural runoff; urban runoff; silvicultural runoff; marinas; recreational boating; and hydromodification such as dams, levees, and shoreline erosion.

Geographic Initiatives. In response to the multiple-use nature of coastal resources, coastal resource managers increasingly base data collection and management programs on ecologically determined geographic units such as drainage basins, estuaries, or ecosystems. The geographic approach considers the full range of factors that contribute to resource degradation. It requires the collaboration of multiple public and private entities and enhances the potential for balancing multiple-use values.

The EPA National Estuary Program is a partnership established by section 320 of the Clean Water Act which identifies nationally significant estuaries threatened by pollution, development, or overuse. Comprehensive Conservation and Management Plans (CCMPs) identify management options designed to restore targeted estuaries. Federal, state, regional, and local authorities as well as affected industries, academic institutions, and citizens are involved in the development of CCMPs. At present the program includes 21 estuaries, four of which were added in 1992. In 1992 the completed CCMP for

Buzzard's Bay, Massachusetts was approved by EPA. The first CCMP, covering Puget Sound, Washington, was approved in 1991.

Other established EPA programs, such as the Chesapeake Bay Program, Great Lakes Program, and Gulf of Mexico Program also geographically target coastal resources for focused attention. The Near Coastal Waters Program helps EPA identify priority coastal areas and to integrate efforts to protect them in an effort to address gaps in existing coastal management efforts. The Office of Wetlands, Oceans, and Watersheds encourages integrated watershed management planning which has significant implications for coastal water and habitat quality.

Coastal Protection

NOAA and the Department of Interior manage several programs which provide protection for the Nation's coastal resources.

National Marine Sanctuaries. The Marine Protection, Research, and Sanctuaries Act of 1972 provides for the protective management of the nation's unique marine recreational, ecological, historical, research, educational, and aesthetic resources through designation of National Marine Sanctuaries (NMS). Managed by NOAA, these selected areas are the marine equivalent of national parks. They include coral reefs as well as open ocean, and harbor an array of marine plants and animals in addition to providing protection to favorite destinations for recreational fishing and diving. In 1992 the United States nearly doubled the area protected by this program with the establishment of two new sanctuaries: the Flower Garden Banks sanctuary in the Gulf of Mexico and the Monterey Bay sanctuary

National Marine Sanctuaries

<u>Marine Sanctuary</u>	<u>Location</u>	<u>Description</u>
1. Channel Islands	Santa Barbara, CA	1,253 square nautical miles of offshore, nearshore, and internal habitats
2. Cordell Bank	San Francisco, CA	397 square miles of ocean waters surrounding a submerged mountain top.
3. Fagatele Bay	Tutuila Island, American Samoa	25 square miles of terraced coral reef ecosystem typical of Pacific islands.
4. Gray's Reef	Sapelo Island, GA	17 square miles of submerged live-bottom coral reef.
5. Gulf of the Farallones	Along the northwest CA coast	948 square nautical miles of diverse habitat for marine mammals and seabirds.
6. Key Largo	Upper Florida Keys	100 square miles of coral reef.
7. Looe Key	Lower Florida Keys	5.32 square miles of the Florida reef tract.
8. Monitor	Cape Hatteras, NC	A circular area, one nautical mile in diameter, over the wreck of the U.S.S. Monitor.
9. Florida Keys	Upon final designation, it will incorporate Key Largo, Looe Key, and other coral reef areas off FL	2,600 square nautical miles designated by Congress and the President in 1990; an environmental impact statement is being prepared.
10. Monterey Bay	Along the Central California coast	over 4,000 square nautical miles of highly productive ecosystem.
11. Flower Garden Banks	Along the Texas-Louisiana coast.	41.7 nautical miles of the northernmost coral reef community.

Source: U.S. Department of Commerce, NOAA, National Marine Fisheries Service, 1991.

National marine sanctuaries.



Note: Data is as of September 1992.

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA).

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off the coast of California. The Monterey Bay sanctuary, which encompasses over 4000 square nautical miles, is second only to the Great Barrier Reef as the largest marine protected area in the world. The total area now protected under the National Marine Sanctuaries Program is approximately 9500 square nautical miles.

Estuarine Research Reserves. NOAA also protects 425,000 estuarine acres through the National Estuarine Research Reserves System established by CZMA. In 1992 a total of almost 144,000 acres were added to this system with final designation of the ACE-Basin Reserve (134,710 acres) and the North Inlet/Winyah Bay Reserve (9,000 acres), both located in South Carolina.

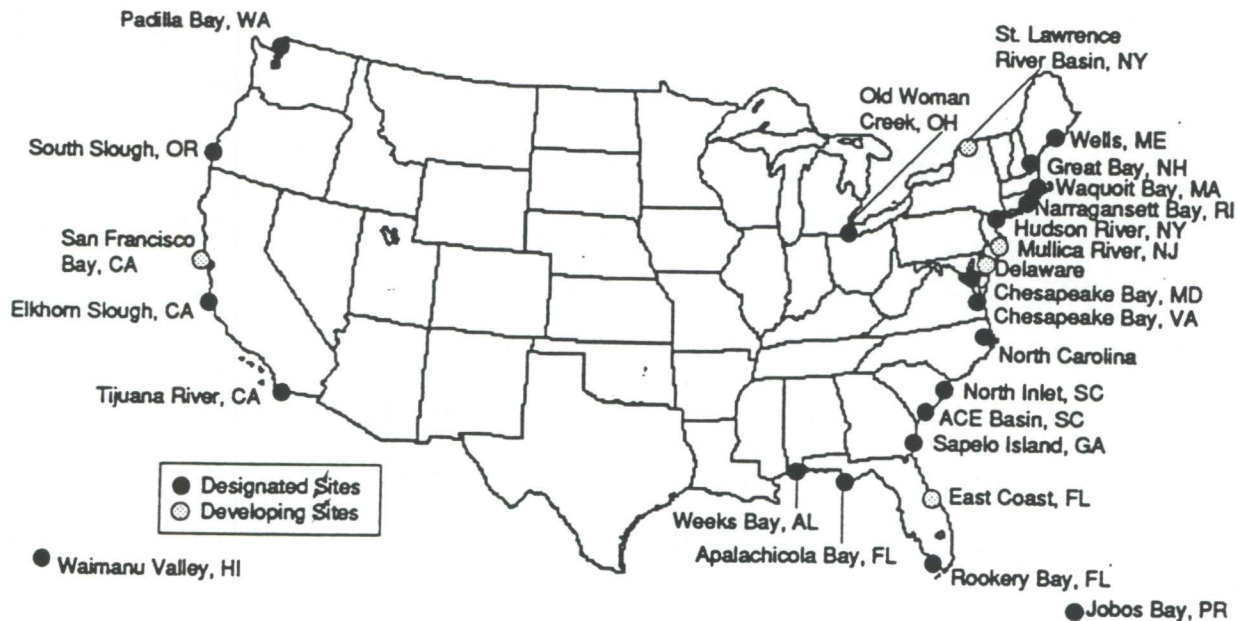
National Wildlife Refuges. Coastal refuges make up 77 million acres, or 86 percent, of the 90 million acres in the National Wildlife Refuge system administered by the U.S. Fish and Wildlife Service in the Department of Interior.

Coastal Barrier System. The Coastal Barrier Resources Act restricts federal spending and assistance for development in the Coastal Barrier Resources System with a goal of reducing damage to these valuable and ecologically sensitive barrier islands. The system includes some 560 units with a total of 1.27 million acres.

Restoration

Along with efforts to prevent and control degradation of the coastal environment, a number of federal programs emphasize restoration of damaged and depleted resources. For example, the Coastal Wetlands Planning, Protection, and Restoration Act of 1990 (CWPPRA) provides grants to coastal states or territories,

National estuarine research reserves.



Note: Data is as of September 1992.

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service.

for acquisition of coastal lands or waters, and for restoration, enhancement, or management of coastal wetland ecosystems. The states are required to maintain coastal lands or waters acquired through the program in a way that meets the objectives of the program: long-term protection of the property itself, its water quality, and its dependent fish and wildlife. The Fish and Wildlife Service coordinates the process through which states and other applicants submit proposals each year for CWPPRA grant funding. Under this program over 69,500 acres of coastal wetlands have been acquired, protected, or restored.

As part of its trustee responsibilities under the Fisheries Management and Conservation Act, the Marine Mammal Protection Act, the Endangered Species Act and other legislation, NOAA is required not only to protect but to restore habitats of living marine resources. The National Marine Fisheries Service houses NOAA's Restoration Center to develop and direct national expertise for the identification and evaluation of restoration alternatives, restoration of injured trust resources, and research and development in the area of restoration methodologies and effectiveness.

Interagency cooperation is essential for the successful protection and restoration of coastal resources. In a case such as the Florida Keys National Marine Sanctuary, most of which is located in state waters, and where a sanctuary abuts land, NOAA's jurisdiction extends only as far as the mean high tide line. NOAA is actively seeking collaboration with state and federal agencies (especially where sanctuaries are adjacent to National Wildlife Refuges, National Parks, or state parks) in an

effort to protect marine sanctuaries from land-based pollution sources. Collaboration is also being sought for enforcement activities in protected areas. The Coastal America initiative is one example of such an effort (see box).

[box with screen]

Coastal America

Several federal agencies established this interagency partnership to restore, preserve and protect the United States' living coastal heritage in 1991. Original partners included agencies with stewardship responsibilities for coastal resources: the departments of the Army, Commerce (NOAA), Interior, and the Environmental Protection Agency (EPA). The President's Council on Environmental Quality (CEQ) coordinates the partnership. In 1992 the partnership expanded to nine departments with the addition of the departments of Agriculture, Air Force, Housing and Urban Development, Navy, and Transportation. Coastal America is now open to any federal agency whose activities affect the coastal zone.

Through the partnership, federal agencies integrate their legislative authorities and programs and leverage federal and non-federal staff and funding in cooperative, site-specific, action-oriented projects focused on addressing loss of habitat, contaminated sediments and nonpoint source pollution. Coastal America is identifying reuse opportunities for coastal military facilities targeted for closure and environmental enhancement opportunities associated with coastal infrastructure development. Collaborative efforts are coordinated at the national and regional levels through interagency committees and projects are implemented through existing agency programs.

During 1992 Coastal America partners engaged in a number of activities at the local, regional, and national levels:

- **Local level.** Partners initiated "shovel in the ground" projects in each of seven regions. Projects involve the participation by at least three federal agencies, a state/local government agency, and a non-governmental organization. A monitoring component to assess the success or failure of the effort and an education/outreach component to inform and involve the public are also included. Local projects have included removing obstructions to fish migrations, constructing wetlands, reducing agricultural nonpoint source pollution from fertilizers and stabilizing eroding shorelines.
- **Regional level.** Coastal America regional implementation maintain a list of priority projects for which they are

seeking partnership arrangements. The teams are developing region-specific action strategies to provide thematic guidance for future work. The New England region, for example, has developed a strategy to restore coastal embayments constricted by transportation facilities, and a resolution was signed with the State of Connecticut to restore its coastal salt marshes.

- **National level.** Coastal America partners have formalized their relationship through a Memorandum of Understanding. At the national level the partners have produced a coastal wetlands report, "Coastal Wetlands of the Continental United States: The Fragile Fringe" and a coastal video catalog. In development are a "Reporters Guide to Ocean and Coastal Issues" and a Coastal Reference and Retrieval System that will provide a single coastal information system or clearinghouse for education/information materials in CD-ROM format.
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Science and Research

While NOAA conducts most federal coastal ocean science programs, other agencies, particularly within the Department of the Interior (DOI), contribute as well. Half of Fish and Wildlife Service research is focused on coastal areas and species. The Minerals Management Service and the U.S. Geological Survey, also within DOI, conduct coastal-related research as well.

Coastal Ocean Program. The NOAA Coastal Ocean Program focuses the science capabilities of NOAA on coastal ocean and Great Lakes issues. The program seeks to improve understanding and predictive capabilities with regard to issues of coastal ocean pollution and habitat degradation, fisheries productivity, and protection of life and property in coastal areas.

EPA Office of Research and Development. The Office of Research and Development at EPA focuses on understanding the cumulative impacts of multiple stresses on marine and estuarine environments. These efforts will enable EPA water programs to

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move beyond their traditional chemical and effluent focus to address ecological exposure and biological responses. New initiatives to address habitat and biodiversity concerns will also have implications for the marine environment.

DOI Minerals Management Service Environmental Studies Program. Within the Department of Interior the MMS conducts a variety of studies through their Environmental Studies Program on fundamental physical, chemical and biological processes; ecosystem function; and abundance and distribution of living marine resources. The information provided by these studies is applied to decisionmaking regarding activities associated with management of offshore oil and gas and mineral resources.

Interagency Collaboration. Within the President's Office of Science and Technology Policy, the federal interagency Committee on Earth and Environmental Sciences (CEES) has a Subcommittee on U.S. Coastal Ocean Science (SUSCOS). SUSCOS coordinates the work of several agencies to obtain a predictive understanding of the processes associated with the coastal environment. Subcommittee members represent the Department of Agriculture, Commerce, Defense, Energy, Interior, State and Transportation along with EPA, NASA and the National Science Foundation. The subcommittee provides long-range, coordinated planning for the federal coastal ocean science effort.

Monitoring and Assessment. NOAA and EPA are responsible for monitoring coastal waters. NOAA's Strategic Assessment Program organizes and synthesizes existing information on U.S. coastal and ocean characteristics. The assessments are designed to assist public and private sector decisionmakers in the setting of

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national or regional objectives for coastal resource management; in identifying the means to achieve objectives, and in evaluating the effectiveness of management strategies. NOAA also is responsible for the Large Marine Ecosystem (LME) Initiative which is developing strategies for monitoring the health of coastal ocean ecosystems around the world.

At the watershed level, the National Estuary Program (NEP) has developed guidance for individual estuary programs to follow in designing strategies for monitoring the effectiveness of management activities. Based on the report "Managing Troubled Waters" (put out by the National Research Council) this effort will guide the development of monitoring plans for the 21 estuaries in the NEP and could provide a model for other programs.

DEPARTMENT OF DEFENSE

Also see Federal Facilities Management, Pollution Prevention, and related tables and figures in Part II.

National security depends on the wellbeing of the environment, and federal agencies charged with protecting national security are also responsible for protecting the environment. The linkage between these responsibilities is evident in the environmental program of the Department of Defense (DOD). In 1991 for the first time, the United States recognized environmental issues as a national security concern. The National Security Strategy, stated:

Global environmental concerns include such diverse but interrelated issues as stratospheric ozone depletion, climate change, food security, water supply, deforestation, biodiversity, and treatment of wastes. A common ingredient in each is that they respect no international boundaries. The stress from these environmental challenges is already contributing to political conflict. Recognizing a shared responsibility for global stewardship is a necessary step for global progress. Our partners will find the United States a ready and active participant in this effort.

DOD is steward of 25 million acres of public land at 600 major installations in the United States and of an additional 2 million acres abroad. Military installations range from a few acres for weather stations and radar sites to a million acres for

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training installations and bombing ranges. In spite of intensive military use for many years, DOD lands contain a rich diversity of flora and fauna.

While accomplishing its primary mission--defending the national security interests of the United States--DOD seeks to be a leader in federal agency compliance with environmental laws and regulations and stewardship of the natural resources on the military installations.

Conditions and Trends

In 1992 the Secretary of Defense set the pace for improving environmental quality in all DOD activities by providing that the Department should:

Fund environmental compliance, restoration and pollution prevention sufficient to achieve sustainable compliance with federal and state environmental laws and governing standards overseas; and to minimize negative mission impacts and future costs and to provide federal leadership in environmental protection.

To conduct environmental programs and to accelerate compliance and cleanups of past contamination, DOD requested a supplement of \$1 billion which brought total fiscal 1992 environmental funding to \$3.9 billion. Base-level funding for fiscal 1993 programs is \$3.7 billion.

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Improving the DOD Environmental Program

A review of environmental management has led DOD to institute the following changes in its environmental program:

- Organizational structure, with particular emphasis on unmet needs at the regional, state, and local level;
- Education and training across all military services and members of the DOD community;
- Improvements in management of the restoration program to provide environmental protection at lower cost;
- An environmental research and development (R&D) strategic plan to focus efforts and accelerate payback from DOD environmental technology assets; and
- Systems to correct deficiencies in corporate information management for the environmental program.

Examples of initiatives to improve environmental management include the following:

Strategic Environmental R&D. In 1992 DOD established the Strategic Research and Development Program (SERDP) to address environmental matters of concern to DOD and the Department of Energy (DOE). The program will identify priorities in environmental research, technology, and information developed by the two departments for defense purposes. DOD is working with the private sector and other governmental organizations on environmental research. The SERDP Council will prescribe and implement the program and prepare an annual update to a 5-year strategic environmental R&D plan. SERDP will provide government agencies and the private sector access to DOD environmental data. It also will identify energy technologies developed for national defense purposes that have environmentally sound, energy efficient applications for other DOD programs, for DOE and other government programs, and for industrial and commercial applications.

Long-Range Planning. In anticipation of future environmental requirements, DOD is extending environmental planning horizons to the long range. In 1992 the Department issued a Report on Environmental

Requirements and Priorities, which examines prospects for environmental activities through the 1990s. The Department's first environmental R&D strategic plan will provide input for a DOD environmental restoration strategic plan scheduled for 1995.

Policies and Programs

The DOD environmental program has four components: compliance, restoration, pollution prevention, and natural and cultural resource conservation.

Environmental Compliance

A primary element of the DOD compliance strategy is implementation of the National Environmental Policy Act (NEPA). NEPA provides DOD decisionmakers with choices in the manner in which to accomplish the military mission. NEPA is the vehicle for minimizing environmental effects of DOD actions. To address actions that may affect the environment, each of the military services has promulgated NEPA regulations.

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DOD and NEPA

Recent fundamental changes in threats to national security have prompted a major restructuring of the Department of Defense. The easing of international tensions has precipitated base closures in the United States and abroad. In 1992 proposed base closures predominated as the major actions requiring environmental impact statements (EISs) as called for by the National Environmental Policy Act (NEPA). The Department of Defense (DOD) worked closely with

community reuse committees to develop alternatives for the reuse of closed bases and to ensure that the public was an integral part of the decisionmaking process. Base closures can have the following environmental implications:

Consolidation and Restationing. The military is consolidating more activities on fewer installations with potentially greater pressure on environmental resources. Restationing and consolidation has the potential to affect regional environmental quality.

Sale and Reuse of Closed Facilities. The nation will have new choices to make regarding the use of closed military installations.

Cleanups. Base closures may affect cleanup priorities within DOD and within the federal government.

The military services also took the following actions in compliance with NEPA.

Navy/Marines. The Navy integrated NEPA training into the official Navy Training Plan and specified that this training be required of all personnel. To ensure interdisciplinary participation in NEPA decisionmaking, the Marine Corps established environmental impact review boards at each installation and at the Marine Corps Headquarters to review EISs and forward recommendations to decisionmakers.

Army. The Army prepared a "NEPA Compliance Manual for Base Realignment and Closure" to guide the preparers of NEPA analyses and help ensure that military and civilian decisionmakers have adequate environmental information upon which to make decisions about the Army base structure of the twenty-first century.

Air Force. To involve the public in the NEPA process, the Air Force recently declassified aspects of the Space Nuclear Thermal Propulsion Program. The Air Force is using the NEPA process as a forum to address public concerns about the development and testing of a new nuclear program. In 1992 the Air Force held public scoping meetings in Alaska and is preparing an EIS to address the environmental effects of a High Frequency Active Auroral Research Program that would build and operate an Ionosphere Research Instrument in Alaska to study the basic properties of the Arctic ionosphere.

Army. In 1987 the Army prepared an environmental assessment (EA) to determine consequences of constructing demonstration and validation testing for the Strategic Defense Initiative on Kwajalein Atoll. Because of existing environmental problems on the

island, the EA revealed potential cumulative impacts, if the project proceeded as planned. Based on this information, the Army prepared an EIS to address cumulative environmental effects and detail an extensive mitigation plan to reduce effects of the SDI proposal and mitigate environmental effects of ongoing operations.

Navy. The Navy is preparing a Supplemental EIS for new dredging operations at two naval installations in San Francisco Bay. The result of several years of research and cooperation among the Navy, the Army Corps of Engineers, EPA, and state regulatory agencies, the EIS will determine the most environmentally sound manner to dispose of dredge material while maintaining adequate depth for ship transit. This document also serves as the major database in the designation process of a regional disposal site for dredging in San Francisco Bay.

Army and Air Force. To provide information for decisionmakers, the Army and Air Force have integrated the NEPA process with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) process in a unified analysis and documentation. The Air Force has integrated its environmental impact analysis process under NEPA and the CERCLA process into a single effort for the BOMARC Missile accident site cleanup. The integration increased public input in developing a method and level of cleanup for the site and enhanced information available to the decisionmaker so that the best alternative could be selected.

DOD environmental compliance projects are designed to meet regulatory standards that protect human health and the environment. Projects address the following areas:

- Hazardous waste management,
- Underground storage tanks,
- Solid waste management,
- Air pollution abatement,
- Water quality management and safe drinking water, and

- Requirements based on specific environmental statutes.

To achieve compliance in these areas, the Department is emphasizing education and training, an environmental ethic for the Defense community, and public awareness and participation in DOD environmental activities. Each of the military departments has implemented a comprehensive environmental audit program to highlight problems at facilities before they become violations. Environmental audits enable installations to plan and budget for environmental projects needed to maintain compliance.

Pollution Prevention

Recognizing pollution prevention through source reduction as the key to a cleaner environment, DOD has adopted a pollution prevention strategy, in which the military services are providing the following examples:

Systems Acquisition. The Navy is conducting Logistics Review Group audits of hazardous material use and hazardous material control plans for all new weapon systems and for major system modifications to ensure reduction of hazardous material and hazardous waste. The Air Force has prohibited use of certain hazardous materials, including chlorofluorocarbons, cadmium, and chromium, in the design, manufacture, and operation of the new F-22 fighter plane with no sacrifice of cost, schedule, or performance.

Material Substitution. Kelly Air Force Base, Texas, replaced cyanide stripping baths with non-cyanide strippers, thus saving \$390,000 annually on treatment and disposal costs. Scranton Army Ammunition Plant, Pennsylvania, eliminated the use of chromic acid rinse in preparing steel surfaces for painting.

Process Improvement. By substituting an alternative cleaning process for vapor degreasers, the Naval Aviation Depot at Jacksonville, Florida, eliminated 300,000 pounds of waste annually and reduced volatile organic compounds emissions by 66 percent. The Naval Air Station at Miramar, California, designed and built a totally enclosed system for recycling more than 20,000 pounds of solvent, grease, and hydraulic fluid-contaminated rags. The Navy estimates savings of \$350,000 a year by using this recycling system.

Improved Material Management. The Naval Air Station at Point Mugu, California, developed a centralized hazardous material control system. In the first year, purchases of hazardous materials decreased 49 percent, and hazardous waste disposal decreased 73 percent.

Alternative Energy Sources. To prevent one of the most common and problematic sources of air pollution, DOD and the Department of Energy (DOE) purchased 2,000 alternate fuel vehicles. The vehicles run on electric batteries, 100-percent compressed natural gas, or 85-percent methanol/15-percent

CEQ ANNUAL REPORT REVIEW DRAFT 11/20/92 DO NOT CITE OR DISTRIBUTE gasoline. (For more information, see the Federal Facilities Management section.)

Such efforts have the combined effect of reducing pollution, improving worker protection, providing more efficient use of natural resources, and saving money. For these reasons, DOD is shifting management emphasis to pollution prevention as a low-cost, environmentally sound alternative to pollution control and contamination cleanup.

Hazardous waste reduction is a prime example of pollution prevention. In June 1987 DOD established a goal of reducing hazardous waste disposal by 50 percent before the end of 1992. In 1991 the Department reduced its hazardous waste disposal by 53.9 percent--a year ahead of schedule--and much of the reduction occurred during a time of increased production and maintenance activity related to Desert Shield and Desert Storm. More than 85 percent of the reduction is attributable to improvements in waste minimization efforts at DOD shipyards, maintenance depots, and air logistics centers. Such facilities account for 60 percent of all hazardous waste generated by the Department. The remaining 40 percent is generated by such areas as daily installation operations and training facilities.

DOD installations were recipients of several of the EPA Administrator's Pollution Prevention Awards for 1991:

- **Single-Coat Paint.** The Navy Exploratory Development Program, Warminster, Pennsylvania, won for developing a

new single-coat paint that reduces volatile organic compounds and hazardous waste by 67 percent.

- **Planning and Implementation.** Fairchild Air Force Base, Washington, won as a model for comprehensive pollution prevention planning and implementation.
- **R&D Pool.** The Army Depot Systems Command, Chambersburg, Pennsylvania, was a runner-up for a program that pools pollution R&D among several depots.

In February 1992 President Bush announced that the United States would accelerate the phaseout of the production of ozone-depleting substances by 1995. DOD developed a program to help achieve the President's goal through initiatives such as the following:

- **Army.** To reduce reliance on chlorofluorocarbons (CFCs) and halons, the Army is developing programs to apply current-technology chemicals and processes to weapon systems applications.
- **Navy.** To focus on use reduction through alternative non-CFC technologies, chemical conservation, and inventory management, the Navy is supporting research on substitute materials in two industry/government consortia--Halon Alternatives Research Corporation and the Solvents Working Group.

- **Air Force.** In addition to use reduction, the Air Force is working with industry to find or develop CFC replacements, with emphasis on alternatives to substance CFC-113 and methyl chloroform.

Environmental Restoration

In fiscal 1991 DOD invested \$1 billion in cleanup efforts through the Defense Environmental Restoration Program (DERP), an increase of \$464 million over the previous year. For fiscal 1992 DOD requested \$1.6 billion, including a supplemental request of \$450 million, for an increase of 160 percent over a 2-year period. The fiscal 1993 budget request of \$1.5 billion will allow DOD to restructure environmental cleanups and improve program management. The Department is accelerating characterizations of remaining contaminated sites and developing cost-reduction initiatives to develop a comprehensive restoration strategic plan by 1995.

The Department continued to evaluate and remediate DOD sites placed on the National Priorities List (NPL) by EPA. Of 1,800 installations in the DOD restoration program, only 90 have been listed on or proposed for the NPL. In 1991 EPA added one military installation to the NPL, the Pearl Harbor Naval Complex on the island of Oahu, Hawaii. [UPDATE FOR 1992?] DOD has completed preliminary assessments for the 90 military installations on the NPL and is moving from the remedial

investigation and feasibility study phase into remediation and cleanup. In fiscal 1991 DERP recorded the following accomplishments:

- Cleanup at a third of the 1,800 DERP sites with no further restoration actions required.
- Environmental training for 2,000 military and civilian personnel.
- A 63-percent increase in sites with completed studies quantifying the amount and extent of contamination, and a 26-percent increase in sites with remedial action completed.

In 1992 DOD conducted 180 remedial actions at military installations on the NPL, including immediate response actions to protect public health, immediate removal of contaminants, alternative drinking water supplies, and installation of permanent remedies such as groundwater treatment facilities.

Over 30 states and territories have entered into memoranda of agreement with DOD to support environmental restoration at 400 military installations. Through cooperative agreements, DOD has reimbursed states \$16 million for services to expedite the review and approval of studies and cleanup decisions.

Natural and Cultural Resource Conservation

The Department sponsors the Legacy Resource Management Program, a comprehensive, long-range effort to integrate

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biological, cultural, and geophysical resources on DOD lands with the demands of the military mission. The program emphasizes the stewardship of DOD lands and gives priority to identifying, conserving, and restoring natural and cultural resources. To demonstrate more effective conservation techniques, the program evaluates natural and cultural resources for their significance to such values as biodiversity and historic interpretation. Partnerships with federal, state, and local agencies and private groups help DOD accomplish the Legacy objectives.

In 1992 DOD received 1,000 Legacy proposals from the military services and another 100 proposals from private groups or other agencies. The Department added 300 new Legacy demonstration projects for a total of 400 conservation projects throughout the United States and U.S. territories.

Natural Resources. Project themes include interpretive trails and materials, viewing sites, and educational centers; threatened and endangered species; species inventory and monitoring and resource management; habitat restoration and improvement; wetlands; sedimentation and erosion control; and biodiversity. Examples follow.

- **Management Data.** An Integrated Training Area Management Program (ITAM), developed by the Army, helps military trainers manage natural resources. ITAM generates such data as soil types, vegetative cover, and equipment size and weight useful in management

decisions regarding the rest and rotation of training lands. Implemented on 53 Army and Marine Corps installations in the United States and abroad, ITAM is assisting planners of base realignment and closures to determine the capability of land to sustain proposals.

- **Revitalizing Wetlands.** To revitalize wetlands on military installations, DOD is working with the U.S. Fish and Wildlife Service and 17 conservation groups. The Vandenberg Air Force Base, California, and the Nature Conservancy developed an accord to protect 5,000 acres of wetlands, 9,000 acres of undisturbed dunes, relic stands of native bunchgrass, and the largest existing remnant of globally rare Burton Mesa chaparral. The Navy joined with the Defenders of Wildlife to establish a Watchable Wildlife area at the Sprague Neck Bar Ecological Reserve, on land held by Naval Communications in Cutler, Maine. The area, a long cobble beach reaching into Machias Bay, hosts bald eagles, migrating shorebirds and waterfowl.

Cultural Resources. Project themes include historic buildings and sites; public awareness; archeological procedures; ethnohistories and oral histories; rock art; technology; and the history of the Cold War. Examples follow.

- **History and Prehistory.** DOD has prepared a handbook for occupants of historic family quarters, a brochure on DOD cultural resources, and an archeological overview of ten central states. DOD is gathering information on the prehistory of the Great Plains in cooperation with state historic preservation officers, universities, and archaeology programs.
- **World War II Places.** To increase public awareness of the significance of places associated with World War II, DOD is restoring the World War II temporary chapel at Adak, Alaska; developing a walking-tour brochure for Pearl Harbor, Hawaii; publishing a history of the construction of World War II-era temporary Army buildings; and developing an exhibit, Building for World War II, at the National Building Museum, in Washington, D.C.
- **Cold War History.** In 1992 the Department examined the role of DOD in the inventory, protection, and conservation of Cold War artifacts.

ECONOMICS

Also see Budget, Private Sector Initiatives, and related tables and figures in Part II.

During much of the last century, Americans depleted natural resources with little thought for the environmental damage they were causing. The nation continued to overlook environmental damages until polluted water and air began to threaten human health, and species and ecosystems began to disappear. Then, in the last thirty years, the public began to see how thoughtless economic activity could deplete resources and damage the environment so much that it would harm their wellbeing and that of future generations. The nation responded by enacting some of the most sweeping interventions in the U.S. economy in history. Today policymakers continue to search for policies and practices that harmonize the nation's economic and environmental goals.

Conditions and Trends

Despite the environmental progress seen during the last generation, many producers and consumers continue to make choices that unnecessarily deplete or degrade natural resources. One reason is that the costs of using natural resources are not

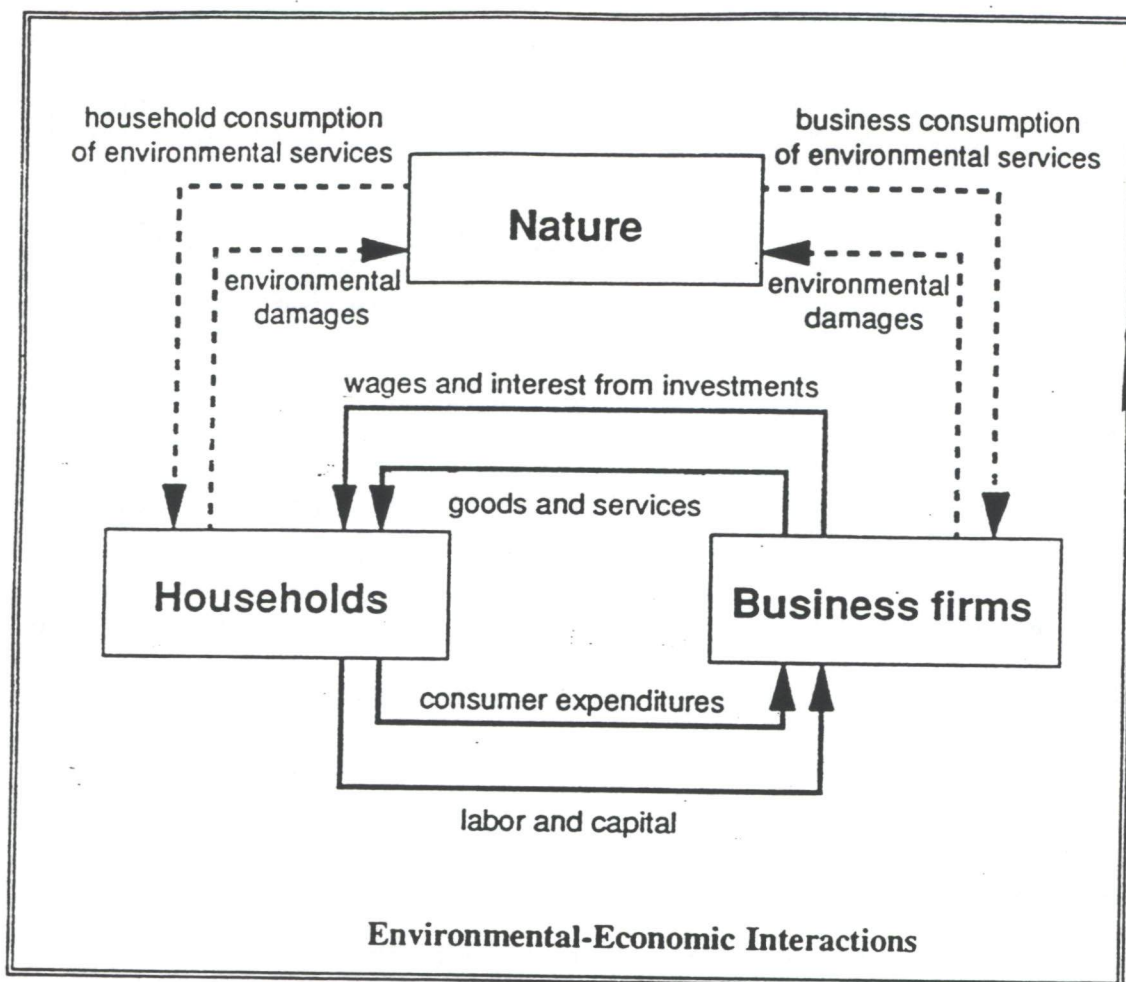
always fully paid by the users. If the costs of using natural resources do not reflect total costs, producers and consumers have no incentive to use them efficiently. Through a variety of policies, the federal government seeks to ensure that economic actors do recognize the total costs of using natural resources and, accordingly, manage them better.

A Shift in Emphasis

Early federal policies to protect the environment typically specified the environmental goal, the method to achieve the goal, a deadline, and penalties for failure to comply. While this approach has produced appreciable results, its costs rise sharply for each additional increment of pollution cleanup mandated. Under existing and planned regulations, EPA estimates that pollution control costs will increase by nearly 50 percent between 1991 and 2000 (from \$107 billion to \$148 billion in 1986 dollars, annualized at 7 percent). Another weakness of the command-and-control approach involves problems such as pollution from small, widely dispersed sources ("nonpoint" sources) or from hazardous waste disposal--problems which are difficult or impossible to resolve with traditional approaches.

More recently, the federal government has begun to consider and apply market-based incentives and other economic tools to help reduce the cost and improve the effectiveness of

Environmental Accounting



environmental policies. For example, using a market-based approach, the government would specify the environmental goal, but polluters would have more flexibility to meet the goal using whatever method is most cost-effective for them. Federal agencies have applied market incentives to a widening range of issues, from phasing out lead in gasoline to managing fishery resources.

U.S. environmental policies are also constantly adjusting to both domestic and international economic developments.

Domestic Factors

In the domestic economy, concerns about U.S. competitiveness and the budget deficit will influence the options for environmental policies and the management of natural resources.

Budget Deficit. During the last decade, the United States was a consumer nation rather than an investor nation. Large public debts accumulated during this period, and interest payments on the national debt increased correspondingly. In the 1990s the nation will almost certainly devote more attention to reducing the annual federal budget deficit. If it does, the federal government's ability to fund new or existing environmental initiatives will be limited. In combination with the public's demand for a healthy environment, these fiscal constraints will create pressure to provide cost-effective

environmental protection through innovative policy approaches.

Competitiveness. The pressure to achieve environmental goals at the lowest possible cost also extends to the private sector. As U.S. firms deal with intense competition in domestic and foreign markets, they will demand that government reduce the cost of environmental regulations without sacrificing environmental quality.

Techniques such as market-based incentives, negotiated rulemakings, and voluntary partnerships promise to improve the U.S. standard of living and environmental quality by reducing the cost of achieving environmental goals. In turn, the development and application of cost-effective environmental policies will enable U.S. firms and workers to remain competitive in world markets. Firms that succeed in developing cost-effective, environmentally-sensitive products and services will be able to expand their market share in the U.S. and around the world.

Managing Natural Resources. Every industry uses natural resources to some extent to produce goods and services; in the nation's \$5.7 trillion economy, particular industries earn nearly \$200 billion annually in profits from direct use of natural resources, including agriculture, forestry, fisheries, and minerals. The conservation and appropriate development of natural resources is essential to U.S. economic and personal wellbeing.

Budget deficits will create pressure for the federal government to increase net revenues from development of natural resources in the public domain. The federal government will also need to consider reducing or eliminating subsidies and establishing a more appropriate level of fees for uses of public lands that deplete or degrade natural resources, such as mineral extraction, timber harvesting, grazing, and fishing. Under a market-based approach, resource users pay fees that better reflect depletion or damage costs, which provide the incentive to efficiently use and conserve natural resources.

Expenditures and Revenues. EPA estimates that U.S. spending for 1991 pollution abatement and control by both public and private sectors was \$107 billion (annualized cost at 7 percent using 1986 constant dollars). From 1972 to 1991, pollution control costs quadrupled from \$26 billion (0.9 percent of GDP) to \$107 billion (2.2 percent of GDP). EPA estimates that these costs will continue to grow, reaching approximately \$148 billion (2.6 percent of GDP) by the year 2000. More than 37 percent of these expenditures are for capital costs such as technology and equipment, while about 53 percent are for operating costs.

In 1992 direct gross federal expenditures for natural resources and the environment totaled an estimated \$20.2 billion, with the largest portion, \$6.1 billion, allocated to pollution control and prevention. Real federal expenditures (1987 constant

dollars) for natural resources and the environment peaked in 1980 and since then have fluctuated below the 1980 level. [CHART ON FEDERAL GROSS SPENDING AND REVENUE SOURCES]

In 1992 the federal government collected an estimated \$7.6 billion in revenues from natural resources and environmental-related sources such the following:

- Royalties and fees from leasing and extraction of oil, natural gas, and minerals (\$2.8 billion)
- Fees from timber harvesting, grazing, and other land product uses (\$1.6 billion);
- Taxes on chlorofluorocarbons (\$662 million);
- Penalties and recoveries from environmental cleanup (\$2.0 billion).

[TABLE]

National Economic Accounts. Nations measure the monetary value of goods and services from economic activity as an indicator of national wellbeing. One of these measures is gross domestic product (GDP)--the value of goods and services produced within the borders of a nation. Currently, however, accounting systems used to estimate GDP do not reflect depletion or degradation of the natural resources used to produce goods and services. For example, the United States can increase GDP with goods and services from harvesting its national forests, but the GDP figures do not reflect the depletion of the nation's timber

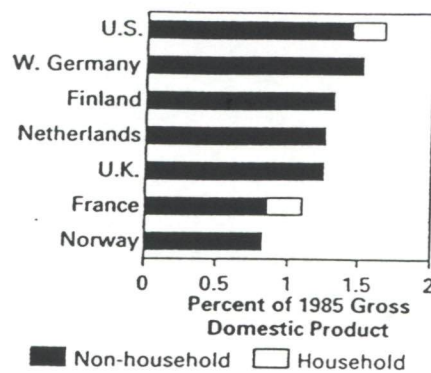
resources. As a result, an increase in GDP from economic activities that deplete or degrade natural resources is not a good indicator of a nation's ability to produce income from natural resources in the future. Economists within government agencies and in the private sector are studying how to count depletion or degradation of natural resources in national economic accounts.

International Factors

With the end of the Cold War, nations are devoting increased attention to shared economic and environmental challenges. This development is essential since many environmental problems, such as acid rain, ozone depletion, climate change, and resource depletion in developing countries can only be addressed effectively through global cooperation. [CHART ON POLLUTION EXPENDITURES BY NATIONS AS A PERCENT OF GNP]

The concept of sustainable development means using resources in a way that provides equal or greater opportunities for future generations to enjoy economic and personal wellbeing. The United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in June 1992, adopted several landmark agreements among nations to promote sustainable development, with an emphasis on market-based strategies. For further information

U.S. and western European expenditures for pollution control.



Source: U.S. Environmental Protection Agency, *Environmental Investments: The Cost of a Clean Environment*, (Washington, DC: EPA, 1990).

on these issues and agreements, see the International Issues section.

Programs and Policies

In 1992 the Bush administration continued its efforts to integrate economic and environmental policies. Such efforts included initiatives aimed at providing better information and incorporating market-based incentives into environmental programs.

Environmental Accounting and Valuation

Among current initiatives in environmental accounting and valuation are the following:

Satellite Accounts for Natural Resources. New international guidelines on economic accounting are likely to be adopted by the United Nations Statistical Commission in 1993, laying the groundwork for development in each country of satellite accounts that would record the depletion of natural resources. The Bureau of Economic Analysis in the Department of Commerce has participated in the development of these guidelines and expects to revise U.S. national accounts accordingly in the future. Initially, BEA is investigating the feasibility of tracking petroleum, a nonrenewable natural resource, and timber, a renewable natural resource.

Chesapeake Bay Accounting. EPA is exploring methods to introduce environmental considerations into conventional economic accounting systems. For example, one may view the Chesapeake Bay as a collection of natural assets providing goods and services valued by society. [CHART] Because most of these natural assets are not bought and sold in the marketplace, they have no observable market prices to record their value and depreciation over time in existing domestic income accounts. In 1992 EPA supported a study in which researchers developed an environmental accounting system of the Chesapeake Bay to incorporate the value and depletion of its natural assets into domestic income accounts. The EPA Science Advisory Board is reviewing the study, and a final report should be available in early 1993.

Coastal Environmental Valuation. To meet the needs of state and local planners and coastal zone managers, the National Oceanic and Atmospheric Association (NOAA) established an Economics Group within its Coastal Ocean Program. This group initiated a project to assist with valuation of natural resources and environmental impacts. The valuations may be used by governments for damage assessments and resource management purposes. NOAA assembled a panel of experts to review and comment on the use of the contingent valuation method, which surveys public opinion as a technique for estimating values of natural resources in monetary terms.

Harnessing Market Forces

To harness market forces to benefit the environment, federal agencies are taking the following initiatives:

Marketing Guidelines. In July 1992 the Federal Trade Commission (FTC) issued national guidelines to prevent misleading environmental marketing claims and provide consumers with the information necessary to choose products that minimize environmental damage. Through the FTC guidelines and educational efforts on environmental claims, consumers will have access to information to make more informed choices in the marketplace. For more information on the FTC guidelines, see the Pollution Prevention section.

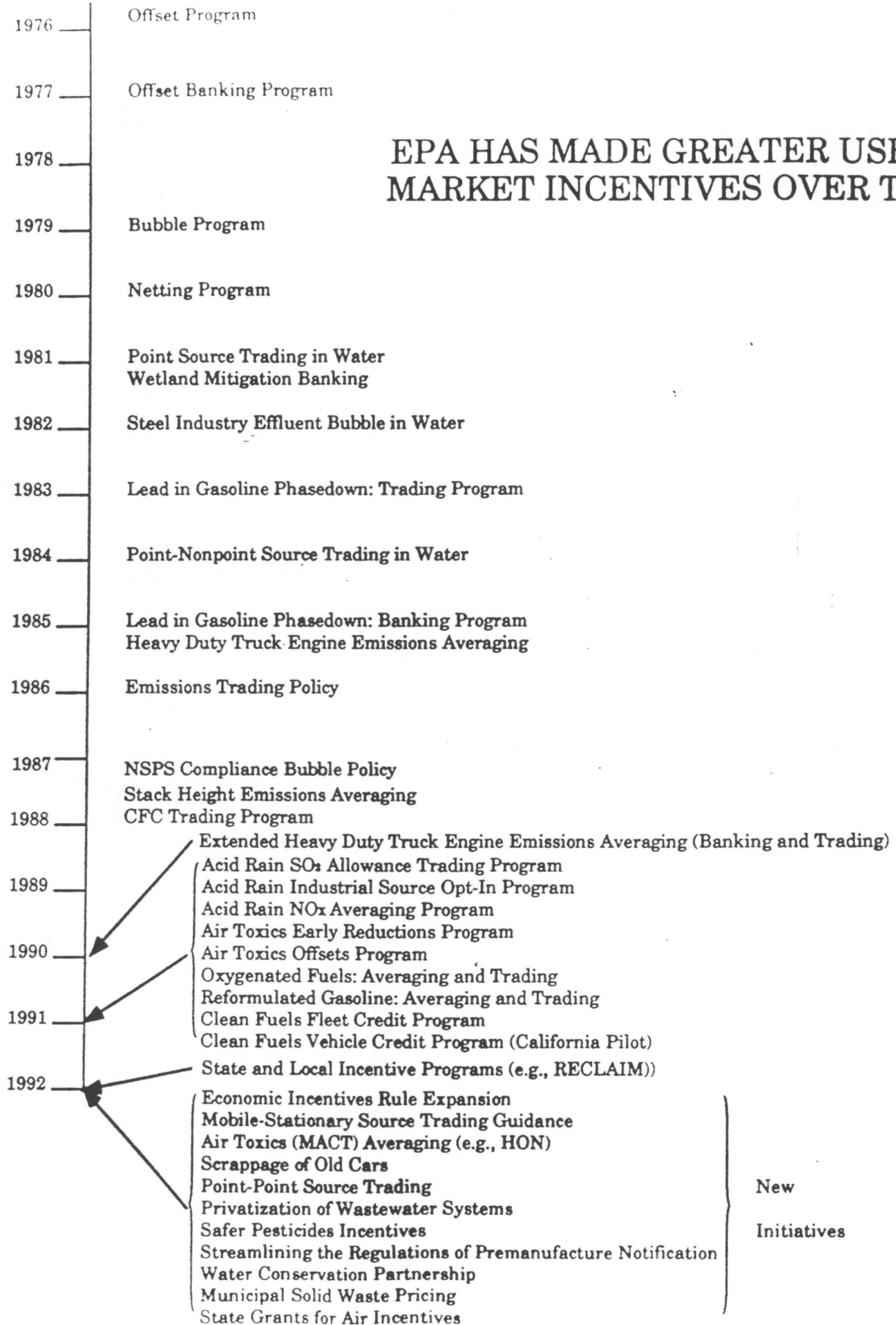
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Harnessing Market Forces: Tradable Permits

In 1992 the Environmental Protection Agency (EPA) introduced or accelerated a number of initiatives that use tradable permits to improve national efficiency in attaining air and water quality goals. Here is how they work:

Under a tradable or marketable permit system, firms are given permits that specify an allowable level of pollutant emissions and allowed to choose a compliance strategy that is the most appropriate and cost-effective for the firm. If a firm with relatively low compliance costs can reduce its pollutant emissions below the allowable level, it can sell or trade its extra pollution allowance to others. In short, the system achieves an overall national pollution reduction goal while creating an economic incentive for firms to make large reductions as quickly and cheaply as possible.

EPA HAS MADE GREATER USE OF MARKET INCENTIVES OVER TIME



In contrast, the traditional command-and-control approach, which forces every firm to reduce emissions by a certain percentage or use a specific technology, imposes widely varying costs on polluters, with no incentive to minimize costs, and maximum incentive to delay regulations through litigation.

Regional Emissions Trading. The South Coast Air Quality Management District (SCAQMD) in California is developing a marketable permits program to establish a Regional Clean Air Incentives Market (RECLAIM). The goals are to lower costs, increase flexibility, and attain state and federal air quality standards. The district will submit the program to EPA for review and approval as part of the California State Implementation Plan required by the Clean Air Act. EPA is assisting in developing state regulations to implement the program, with special attention to emissions quantification, monitoring methods, and enforcement provisions.

Mobile-Stationary Source Trading Program. Under this program, EPA provides guidance to states to clarify how certain requirements of the Clean Air Act Amendments of 1990 can be satisfied by trading emission reductions between mobile and stationary sources of air pollution. For example, a refinery manager might be allowed to meet his emission reduction or offset requirements by buying hundreds of old, high-polluting cars--the "cash for clunkers" concept.

Point/Nonpoint Source Trading. In 1992 EPA studied the potential of trading between point and nonpoint sources of water pollution. Under most scenarios under consideration, regulated point sources could defer water treatment system upgrades if they would pay for or arrange for equivalent or greater reductions in nonpoint source pollution within the same watershed. EPA has approved some use of point/nonpoint source trading involving nutrient pollutants in water bodies of moderate water quality. Programs have been developed for Cherry Creek Reservoir and Dillon Reservoir in Colorado and for Tar-Palmico River Basin in North Carolina. EPA and other agencies are evaluating the results of these programs.

Conservation and Management

Environmental economics serves natural resources management in a number of ways. Some examples follow.

Damage Assessments. Requiring the polluter to pay the costs of damaging natural resources provides an incentive to prevent future pollution. Under the Oil Pollution Act of 1990 and the Superfund Amendments and Reauthorization Act of 1986, NOAA and the Department of the Interior (DOI) are developing regulations to measure damages resulting from releases of oil and hazardous substances into the environment. NOAA and DOI assist government agencies designated as "natural resource trustees" in measuring

the ecological effects and economic damages of such accidents. These assessments enable government agencies to prosecute liable parties for recovery of damages, and trustees may use the monies recovered to restore injured resources.

Incremental Cost Analysis. In 1992 the U.S. Army Corps of Engineers invested \$330 million in fish and wildlife restoration projects and programs. To assure the most efficient allocation of funds, the Corps applied incremental cost analysis, a tool for identifying the highest-value actions available based on habitat quality measurements and economic cost concepts.

Conservation Reserve Program. In 1992 USDA continued to use economic and environmental principles to evaluate bids submitted by farmers to retire highly erodible cropland under the voluntary Conservation Reserve Program (CRP). More than half of current CRP acres are located in the Great Plains. However, since passage of the Food, Agricultural, Conservation and Trade Act of 1990, USDA has shifted new enrollments to the Midwest and Eastern states through a redesigned bid acceptance process and new eligibility criteria. These changes allow USDA to emphasize water quality improvement and select acres to obtain the greatest conservation and environmental benefits per dollar. Of the 1.5 million acres enrolled in CRP in 1991, about 31 percent were located in the Great Plains and Mountain Regions and more than 13 percent (195,000 acres) were enrolled in Conservation Priority

watersheds, including the Chesapeake Bay, Long Island Sound, and the Great Lakes. USDA also accepted more than 24,000 acres in high priority watersheds to improve water quality in coordination with the President's Water Quality Initiative.

Desert Tortoise Conservation Program. As explained in greater detail in the Private Sector Initiatives section, voluntary, proactive partnerships between private companies, environmental groups, and governments are a cost-effective way to balance economic and environmental goals. For example, in suburban Las Vegas, Nevada, in the 1980s conflict arose between homebuilders and conservationists over the decline of the endangered desert tortoise. After years of costly, protracted litigation, the Southern Nevada Homebuilders Association agreed to negotiate a tortoise habitat conservation plan with local governments, the Fish and Wildlife Service and Bureau of Land Management in DOI, and two private groups, the Environmental Defense Fund and Nature Conservancy.

The conservation plan calls for at least 400,000 acres of prime desert tortoise habitat to be set aside in exchange for development rights to more than 22,000 acres of private land in urban areas of Las Vegas. As a condition of federal permits allowing development, builders agreed to contribute \$2.5 million to establish a Desert Tortoise Conservation Center. For every acre developed within the permit boundary, builders contribute

\$550 to the fund for habitat acquisition and management. The federal government has acquired 160,000 acres of land for the tortoise. This ongoing effort provides a model for integrating environmental and economic considerations to protect threatened and endangered species.

ENVIRONMENTAL EDUCATION

Also see Private Sector Initiatives and related tables and figures in Part II.

Public-private partnerships are the key to success in environmental education as well as in other environmental disciplines.

Conditions and Trends

Public interest in environmental education has fluctuated over past decades, but in the 1990s it received new impetus from the America 2000 education strategy developed by President Bush, with the help of state governors, to accomplish excellence-in-education goals by the year 2000. Among these goals, making U.S. students the first in the world in science and mathematics and promoting responsible citizenship are prime factors in environmental education.

Another boost came with passage of the National Environmental Education Act of 1990, which targets students in elementary and secondary schools, as well as post-secondary students, senior citizens, and the general public. The law calls for collaboration among the federal government and the media, private industry, museums, libraries, parks, and recreation facilities and recognizes the need for international cooperation.

To coordinate national and international efforts, the 1990 law

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required EPA to establish an Office of Environmental Education (OEE), which is now in place. OEE will ensure that national and international educational efforts remain well organized and consistent, regardless of future peaks and valleys in public interest.

Policies and Programs

Achieving America 2000 goals of excellence in education will require the cooperation of environmental educators in federal agencies, state and local governments, schools and colleges, professional and public interest groups, business, and industry. The Office of Environmental Education is an advocate for the mission nationally and internationally. In 1992 emphasis was on pollution prevention, sustainable development, and an environmental ethic for the American people. Environmental educators have a dual charge:

- To instill an environmental ethic in America's young people that will prepare them to deal responsibly with the environment throughout their lives, and
- To raise the environmental awareness of adults as informed consumers in the global shift toward sustainable development and pollution prevention.

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Goal 1. Expand communications with environmental experts.

A strong body of research and literature exists along with an experienced cadre of environmental educators. Federal agencies are establishing communications and advisory networks with these educators to ensure that the nation has full benefit of their expertise. EPA has organized the following groups:

National Environmental Education Advisory Council. The 1990 Environmental Education Act called for creation of an advisory council to make recommendations on implementing the act and to prepare a biennial report to Congress assessing the quality of environmental education in the nation and offering recommendations for improvement. An 11-member advisory council representing the nation's geographic areas and minority groups represents a variety of occupations outside of the federal government such as academia and non-profit groups.

Federal Task Force on Environmental Education. The 1990 act also called for a network of federal agencies to coordinate environmental education efforts among federal agencies. Members of the Federal Task Force on Environmental Education include EPA, the Council on Environmental Quality, the departments of the Interior, Agriculture, Education, Energy, State, Health and Human Services, and Defense, the National Science Foundation, the Peace Corps, the Agency for International Development, NASA, TVA, NOAA,

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and the U.S. Information Agency. Task Force subcommittees will develop national goals and identify specific areas for collaboration.

EPA Environmental Education Advisory Board. The board consists of 35 senior representatives from EPA headquarters, regional offices, and research laboratories. Six subcommittees are developing programs, policies, and procedures required by the 1990 act.

Pollution Prevention Advisory Group. This external advisory group makes recommendations to EPA on developing pollution prevention educational materials for students and on teacher training. The 20 members have expertise in education, publishing, communications, minority concerns, and the environment.

NEPA Education and Training Courses. Dozens of federal agencies as well as private entities and universities conduct training and educational courses on the NEPA environmental impact statement process, its requirements, and how it can be better used to integrate environmental values into the federal decisionmaking process to reduce conflict, litigation, and cost. CEQ has compiled a compendium that lists and describes NEPA training courses; copies can be obtained from the Council.

Goal 2. Develop Partnerships to Increase Effectiveness and to Maximize Use of Limited Resources

Federal agencies are forming new coalitions and cooperative ventures with groups not traditionally involved in environmental

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education, such as industry, religious organizations, and senior citizen associations. By engaging all stakeholders in the process and by developing partnerships with grassroots organizations, federal agencies can ensure that programs are responsive to local needs.

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Federal Partnerships in Environmental Education

Federal agencies are forming partnerships with an array of public and private organizations.

Youth Partnerships

A number of public-private partnerships, such as the following, are dedicated to educating the nation's youth on environmental issues.

Students Watching Over Our Planet Earth. SWOOPE is an innovative science-education program offered on the east coast through a partnership between EPA and the Department of Energy. It teaches students in grades K-12 environmental science through hands-on experience.

Boy Scouts and Girl Scouts. EPA has signed memoranda of understanding (MOU) with the Boy Scouts and the Girl Scouts to reinforce environmental education. A Steering Committee oversees three subcommittees: Boy Scouts of America Jamboree Subcommittee; Girl Scouts National Service Project; and an Environmental Education Subcommittee.

Trail Boss. EPA, the departments of Interior, Agriculture, and Defense, and the Boy Scouts of America developed this program to teach skills for training and leading volunteer crews involved in conservation projects.

Future Farmers of America. EPA and FFA have signed an MOU to coordinate environmental education materials and activities. FFA, which includes environmental issues in its primary mission of agricultural education, will collaborate with EPA on new approaches and materials for environmental education. EPA is developing a similar MOU with the National 4-H Council.

Partnerships with Environmental Groups

Federal agencies are working with a number of environmental groups on initiatives, such as the

following:

North American Association for Environmental Education. NAAEE supports innovative environmental education programs. EPA and NAAEE have signed an MOU to coordinate conferences, grant and internship programs, research, and meetings of the National Environmental Education Advisory Council.

Alliance for Environmental Education. AEE, a coalition of organizations, agencies, corporations, and institutions committed to public environmental education is working with EPA and Time/Warner on a mass media campaign to broadcast environmental messages to households nationwide.

Toronto Global Conference on Environmental Education. This conference, held at Toronto, Canada, on October 16, 1992, was a follow-up to actions taken on global environmental education at the U.N. Conference on Environment and Development in June 1992.

National Audubon Society. The Audubon Society, Dow Chemical, and EPA collaborated on a pilot environmental education program for seventh graders in the Great Lakes Region.

Partners Outdoors Action Group for Environmental Education. The Department of the Interior organized this group, whose members represent federal agencies such as Fish and Wildlife Service, EPA, TVA, and USDA Forest Service; environmental organizations, such as NAAEE and the Wildlife Habitat Enhancement Council; and businesses such as L.L. Bean and Time Mirror Magazines, Inc. The mission is to make environmental education available to individuals and families using outdoor recreational facilities and products.

Academy for Educational Development. The Fish and Wildlife Service (FWS) is working with AED and NAAEE to develop social marketing and educational methods and techniques to resolve human caused environmental problems on wildlife refuges.

Partnerships with Business

EPA collaborates with private corporations on pilot educational projects, educational materials, and environmental awards. The EPA Office of Environmental Education, assisted by the National Education and Training Foundation, is working on plans for future partnerships.

An example is the videotape, "A Home for Pearl," produced by the Fish and Wildlife Service to teach elementary students about wildlife habitat. Phillips Petroleum Company provided a \$25,000 grant to the National Fish and Wildlife Foundation to distribute the videotape and teacher's guide to U.S. teachers. The

Southern Educational Communications Association (SECA) transmitted the videotape by satellite to public TV stations in 47 states and distributed 20,000 teacher's guides. The U.S. Information Agency transmitted the videotape by satellite to American embassies all over the world. Viewers have requested copies in French, Spanish, and Russian, and the video is being shown in Jakarta, Indonesia; Nassau, Bahamas; New Delhi, India; Namibia; and Madagascar. Through partnerships, FWS has distributed 7,500 copies of the instructional videotape.

Partnerships with Health Organizations

Public-private partnerships are increasing educational efforts to reduce health problems associated with environmental factors, such as lead poisoning. The EPA Office of Environmental Education is concentrating on educational programs in urban areas to target segments of the population that are not being reached, such as minority and multi-ethnic communities, senior citizens, and illiterate persons.

Partnerships with State and Local Governments

Many state and local governments have environmental education programs in place that can serve as models for other locales. OEE is collaborating with public agencies at all levels to disperse information, reinforce consistent messages, and minimize duplication of effort.

Partnerships with Academia

Liaisons with colleges and universities helps keep federal agencies informed on current research and innovative methods of environmental education. OEE is using grant programs to fund environmental initiatives at institutions of higher education.

Partnerships with Senior Citizen Groups

Many senior citizens have the time to take part in environmental education programs of benefit to their communities. OEE is contacting senior citizens organizations, especially retired educators, to enlist their support in carrying out environmental education projects that reach all segments of society.

Goal 3. Increase the number and skills of teachers who infuse environmental issues into their curricula.

Federal agencies are supporting the development of training

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programs and materials to ensure that all teachers, including those in nonscientific fields, have the opportunity to receive training and materials that will allow the infusion of environmental education into their curricula.

Teacher-Training Grants. In 1992 EPA awarded a \$1.6 million grant to a consortium of academic institutions, corporations, and non-profit organizations headed by the University of Michigan to develop and operate a national environmental education and training program. The program targets in-service teachers (K-12) as well as non-formal educators and includes curriculum development and evaluation, teacher training, and information dissemination.

Wetlands Education. The Fish and Wildlife Service, in cooperation with the U.S. Geological Survey, has produced an educational poster for elementary and middle school teachers entitled, "Wetlands: Water, Wildlife, Plants and People." It features color aerial views of various types of wetlands and on the back has lesson plans and classroom activities. FWS has distributed 200,000 copies to staff, other federal agencies, private organizations, and educators throughout the United States. Sciencescope and Science for Children, publications which circulate to 90,000 teachers, featured the poster as a special pullout in their September 1992 issues. Copies are available from USGS.

Pollution Prevention. The EPA Pollution Prevention Task Force, an external advisory group, is developing a teacher-training plan and educational materials. With guidance from the task force

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and input from teachers and environmentalists, EPA has designed materials for grades K-12. The project complements the national program being developed by the University of Michigan consortium and may be incorporated into it.

Parks as Classrooms. Through this initiative, the National Park Service enters into partnerships with local schools to develop curricula and provide educational services to park visitors. In 1992 NPS supported 41 projects with funding of \$780,000. Training courses emphasizing cultural, heritage, and environmental themes help prepare interpreters to develop NPS educational programs. Other projects include curriculum development and an exchange-education project developed by the Everglades National Park involving two schools, one in Miami and the other in Chicago.

Heritage Program. BLM has designed an educational program for school children to strengthen their sense of personal responsibility for the stewardship of America's cultural heritage. In 1992 BLM launched the program with an educational video, featuring the Teenage Mutant Ninja Turtles. Two articles on the program appeared in Science and Children, a professional magazine for science teachers, and BLM took part in seven partnership projects to publicize the program.

Goal 4. Encourage and support grassroots efforts.

Because innovative grassroots projects can be particularly responsive to local needs, federal agencies are supporting

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environmental education efforts at the local level. In 1992 OEE awarded \$2.4 million in grants to schools, states, and non-profit organizations to support environmental education projects around the country. Individual grants ranged from \$211,000 to \$250,000, with the majority at less than \$5,000. Some projects focus on specific issues such as water, air, and solid waste management, while others emphasize general environmental education either locally or globally. Educational approaches range from community cleanup to computer games. EPA selected projects for their innovation and applicability in other communities, soliciting grant applications in the fall of each year by means of notices in the Federal Register.

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Environmental Education Grants

The following are examples of over one hundred environmental education grants awarded by EPA in 1992 under the National Environmental Education Act:

- **Nature in a Nutshell.** The Fish and Wildlife Service provided the San Angelo Nature Center in Texas with a grant for \$24,000 to support Nature in a Nutshell, an education and outreach program. The program, established in 1990, receives support from the Junior League, San Angelo Independent School District, and Coca Cola Bottling Company. It has reached 4,000 public and private school students with educational programs about the Edwards Plateau ecosystem.
- **Millions of Trees.** The Napa Valley Unified School District in California received a \$16,835 grant to fund this project, in which students raise living Christmas trees and a variety of native plants that are later used to reforest local areas.
- **If Everyone Lived Like Me.** The Elachee Nature

Science Center and Creative Museum in Georgia received an \$87,500 grant to create an interactive video software program for school children and adults to educate consumers to reduce global pollution.

- **Waste Not, Want Not.** The Colo-Nesco Community School in Iowa received a \$5,000 grant to help equip students to assess environmental issues and to foster international cooperation by addressing such issues.
 - **Seed-to-Table Farm Stewardship Exhibit.** Maine Organic Farmers & Gardeners Association received a \$5,000 grant to prepare a walk-through exhibit for display at public events in New England. Models, games, stories, photos, and performers demonstrate farming practices to protect natural ecosystems.
 - **Building a Wetlands.** The Howard County Public School System in Maryland received a \$22,440 grant to create a wetlands using recycled materials and to develop study areas and curricula for school and community use.
-

Goal 5. Promote careers in the environmental field.

As the public becomes more aware of global environmental problems, federal agencies are increasing support for environmental research. The nation needs environmental scientists, engineers, and other professionals capable of developing preventive solutions to environmental problems. EPA promotes environmental careers and encourages participation of minority students in environmental degree programs through a number of programs, such as the following:

Internships and Fellowship. EPA administers programs that place college interns and in-service teachers in federal agencies active in environmental education. Internships encourage college

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students to pursue careers in environmental science, and fellowships encourage teachers to take their environmental experience back into the classrooms, thereby educating students about the environment and promoting the pursuit of environmental careers.

NOAA administers the Dean John A. Knauss Marine Policy Fellowship that annually supports up to 25 graduate students in the Sea Grant College Program Network for one year of educational experience in Washington, D.C. Federal agencies or Congressional staffs host the fellows, who work on assignments related to the marine environment.

President's Environmental Youth Awards. Young people in all 50 states compete annually in this program which honors outstanding commitment to the environment. National award winners, selected by EPA regional offices, participate in a recognition program in Washington, D.C. Since 1989 President Bush has hosted ceremonies at the White House to honor the ten annual award winners.

National Environmental Education Awards. A new federal awards program creates the following awards to recognize individuals for their contributions to environmental education:

- **Theodore Roosevelt Award** for an outstanding career in environmental education, teaching, or administration;
- **Henry David Thoreau Award** for outstanding literature on the natural environment and pollution problems;
- **Rachel Carson Award** for an exceptional print, film, or

President's Environmental Youth Awards, 1992.

Recipient	Location	Project
Lafayette Regional School	Franconia, New Hampshire	"GreenKids": environmental education and activism.
Solomon Schechter Day School	Commack, New York	"Project C.R.E.A.T.E. (Children Recycling, Acting to save the Environment)": environmental education and activism.
Aaron Cohen	Upper Darby, Pennsylvania	"Recycling Awareness Week": recycling and reuse.
Blue Ridge Elementary School	Evans, Georgia	"Conservation Through Education - The 3 R's (Recycling, Restoring the Environment, and Regenerating a Love and Appreciation of the Earth)": environmental activism.
Rachael Hastings	Rochester Hills, Michigan	Science project: monitoring and improving local water quality.
Becker Elementary School	Austin, Texas	"The Green Classroom": pollution prevention and education.
Elisabeth Reba Clubine	Carthage, Missouri	Water quality project: conservation, aquatic science, and stream clean-up.
Hygiene Elementary School	Hygiene, Colorado	"Tropical Discoveries": environmental education, conservation.
Memorial Academy	San Diego, California	"Energy Club": environmental education, recycling, energy efficiency.
Willow Elementary School	Willow, Alaska	"The Kid Log Company": recycling and conservation.

Source:

U.S. Environmental Protection Agency, 1992.

broadcast contribution to public education on environmental issues; and

- **Gifford Pinchot Award** for an outstanding educational contribution to forestry and natural resource management.

President's Environment and Conservation Challenge Awards.

CEQ, working with private-sector partners, manages this program to recognize U.S. citizens and organizations for outstanding contributions to the nation's environmental quality. One of the four award categories is Education and Communications, in which Presidential medals are awarded for developing informational programs that inspire respect for the environment and raise the public's environmental awareness.

National Network for Environmental Management Studies. NNEMS provides fellowships or paid internships to students in exchange for written studies or reports on environmental science, policy, and management in areas of concern to EPA. Most recipients are students conducting master or doctoral research.

Goal 6. Provide educators and the public with access to appropriate environmental education materials.

A quantity of environmental education materials exists, but quality varies and finding appropriate materials can be difficult. To categorize and provide access to the best materials available, EPA has the following efforts underway:

Clearinghouse. To facilitate information exchange, EPA is developing an interactive computer system for environmental education materials produced by federal agencies and other organizations. EPA is testing the clearinghouse, designed for educators (K-12), during the 1992-1993 school year and plans to have it available to the public for the 1993-1994 school year.

Earth Notes. This quarterly periodical, published by the EPA Office of Environmental Education, contains innovative ideas from educators (K-6) about their first-hand experiences in bringing environmental education into the classroom. The periodical provides an open forum for the exchange of teaching ideas, comments, and brief essays concerning environmental education in the elementary grades.

Goal 7. Educate the general public to make informed decisions.

Federal agencies are improving their ability to communicate complex scientific and technical information to the public. To produce informed citizens capable of making informed decisions to protect the environment, federal agencies are sponsoring projects such as the following;

Media Strategy. EPA is developing a media strategy that federal agencies can use to reach the general public with information about actions that individuals can take to make a difference in the environment. The strategy enlists the help of private partners and the media, including press, television, and

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radio.

Marine Environmental Outreach. In 1992 the U.S. Coast Guard developed an outreach program for the general public and the marine industry. The campaign, scheduled for implementation in early 1993, will raise awareness of regional, national, and international marine pollution issues impacting U.S. waters. To improve relations with private groups, the Coast Guard will publish a Marine Environment Protection Strategy and a newsletter with updates on such topics as plastics in the marine environment, spill-reporting mechanisms, and the unintentional introduction of nonindigenous aquatic species into U.S. waters by ship ballast discharges.

Sea Grant Marine Advisory Service. The NOAA Sea Grant Network sponsors public education/outreach programs that utilize a network of extension professionals in every coastal state. The programs target teachers, state and local policymakers, industrial leaders, and the general public. Educational efforts promote appropriate strategies to protect and wisely use aquatic resources.

Goal 8. Reach beyond national boundaries.

Because environmental risks transcend political boundaries, international information exchanges and joint training ventures have become an environmental education priority, and federal agencies are supporting initiatives around the world.

Sport Fishing Education. Under provisions of the Federal Aid

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in Sport Fish Restoration Act, up to 10 percent of federal funds apportioned by the Fish and Wildlife Service to the states may be used for aquatic resources education. Such programs can include aquatic ecology, aquatic resources management, aquatic safety, conservation ethics, and fishing. The audience is U.S. fishermen and fishermen from other nations fishing in U.S. waters.

Trilateral Memorandum of Understanding. The United States developed a Trilateral Memorandum of Understanding on Environmental Education in cooperation with the governments of the Canada and Mexico to promote environmental education on the North American continent. Educational activities may include information exchanges on educational policies, approaches, and materials; support and participation in seminars, workshops, and conferences; and trilateral initiatives involving the environmental education of youth.

Fulbright Fellowships. The U.S. Information Agency and EPA are developing Fulbright Fellowships for senior research scholars in environmental research and education from the Near Eastern, North African, and South Asian regions. Senior scholars will be eligible for 9-month to 1-year grants to further their environmental studies at an institution of higher education.

International Public-Private Partnerships. Federal agencies are supporting public-private initiatives to promote environmental education in various regions of the world. For example, EPA is sponsoring the Regional Environmental Center for Central and

Eastern Europe, initiated in 1990 in Budapest, Hungary; the Caribbean Environment and Development Institute, initiated in 1992 in Puerto Rico; and the Environmental Education and Information Center, initiated in 1992 in Kiev, Ukraine.

The Department of the Interior also is assisting the government of Hungary in developing a free-market-based mineral development program. Assistance includes training in process and techniques for assessing the potential environmental effects of mineral development. The objective is to provide the basic tools for including consideration of environmental values in decisionmaking.

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Federal Task Force on Environmental Education. The 1990 act also called for a network of federal agencies to coordinate environmental education efforts among federal agencies. Members of the Federal Task Force on Environmental Education include EPA, the Council on Environmental Quality, the departments of the Interior, Agriculture, Education, Energy, State, Health and Human Services, and Defense, the National Science Foundation, the Peace Corps, the Agency for International Development, NASA, TVA, NOAA,

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and the U.S. Information Agency. Task Force subcommittees will develop national goals and identify specific areas for collaboration.

EPA Environmental Education Advisory Board. The board consists of 35 senior representatives from EPA headquarters, regional offices, and research laboratories. Six subcommittees are developing programs, policies, and procedures required by the 1990 act.

Pollution Prevention Advisory Group. This external advisory group makes recommendations to EPA on developing pollution prevention educational materials for students and on teacher training. The 20 members have expertise in education, publishing, communications, minority concerns, and the environment.

NEPA Education and Training Courses. Dozens of federal agencies as well as private entities and universities conduct training and educational courses on the NEPA environmental impact statement process, its requirements, and how it can be better used to integrate environmental values into the federal decisionmaking process to reduce conflict, litigation, and cost. CEQ has compiled a compendium that lists and describes NEPA training courses; copies can be obtained from the Council.

Goal 2. Develop Partnerships to Increase Effectiveness and to Maximize Use of Limited Resources

Federal agencies are forming new coalitions and cooperative ventures with groups not traditionally involved in environmental

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education, such as industry, religious organizations, and senior citizen associations. By engaging all stakeholders in the process and by developing partnerships with grassroots organizations, federal agencies can ensure that programs are responsive to local needs.

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Federal Partnerships in Environmental Education

Federal agencies are forming partnerships with an array of public and private organizations.

Youth Partnerships

A number of public-private partnerships, such as the following, are dedicated to educating the nation's youth on environmental issues.

Students Watching Over Our Planet Earth. SWOOPE is an innovative science-education program offered on the east coast through a partnership between EPA and the Department of Energy. It teaches students in grades K-12 environmental science through hands-on experience.

Boy Scouts and Girl Scouts. EPA has signed memoranda of understanding (MOU) with the Boy Scouts and the Girl Scouts to reinforce environmental education. A Steering Committee oversees three subcommittees: Boy Scouts of America Jamboree Subcommittee; Girl Scouts National Service Project; and an Environmental Education Subcommittee.

Trail Boss. EPA, the departments of Interior, Agriculture, and Defense, and the Boy Scouts of America developed this program to teach skills for training and leading volunteer crews involved in conservation projects.

Future Farmers of America. EPA and FFA have signed an MOU to coordinate environmental education materials and activities. FFA, which includes environmental issues in its primary mission of agricultural education, will collaborate with EPA on new approaches and materials for environmental education. EPA is developing a similar MOU with the National 4-H Council.

Partnerships with Environmental Groups

Federal agencies are working with a number of environmental groups on initiatives, such as the

following:

North American Association for Environmental Education. NAAEE supports innovative environmental education programs. EPA and NAAEE have signed an MOU to coordinate conferences, grant and internship programs, research, and meetings of the National Environmental Education Advisory Council.

Alliance for Environmental Education. AEE, a coalition of organizations, agencies, corporations, and institutions committed to public environmental education is working with EPA and Time/Warner on a mass media campaign to broadcast environmental messages to households nationwide.

Toronto Global Conference on Environmental Education. This conference, held at Toronto, Canada, on October 16, 1992, was a follow-up to actions taken on global environmental education at the U.N. Conference on Environment and Development in June 1992.

National Audubon Society. The Audubon Society, Dow Chemical, and EPA collaborated on a pilot environmental education program for seventh graders in the Great Lakes Region.

Partners Outdoors Action Group for Environmental Education. The Department of the Interior organized this group, whose members represent federal agencies such as Fish and Wildlife Service, EPA, TVA, and USDA Forest Service; environmental organizations, such as NAAEE and the Wildlife Habitat Enhancement Council; and businesses such as L.L. Bean and Time Mirror Magazines, Inc. The mission is to make environmental education available to individuals and families using outdoor recreational facilities and products.

Academy for Educational Development. The Fish and Wildlife Service (FWS) is working with AED and NAAEE to develop social marketing and educational methods and techniques to resolve human caused environmental problems on wildlife refuges.

Partnerships with Business

EPA collaborates with private corporations on pilot educational projects, educational materials, and environmental awards. The EPA Office of Environmental Education, assisted by the National Education and Training Foundation, is working on plans for future partnerships.

An example is the videotape, "A Home for Pearl," produced by the Fish and Wildlife Service to teach elementary students about wildlife habitat. Phillips Petroleum Company provided a \$25,000 grant to the National Fish and Wildlife Foundation to distribute the videotape and teacher's guide to U.S. teachers. The

Southern Educational Communications Association (SECA) transmitted the videotape by satellite to public TV stations in 47 states and distributed 20,000 teacher's guides. The U.S. Information Agency transmitted the videotape by satellite to American embassies all over the world. Viewers have requested copies in French, Spanish, and Russian, and the video is being shown in Jakarta, Indonesia; Nassau, Bahamas; New Delhi, India; Namibia; and Madagascar. Through partnerships, FWS has distributed 7,500 copies of the instructional videotape.

Partnerships with Health Organizations

Public-private partnerships are increasing educational efforts to reduce health problems associated with environmental factors, such as lead poisoning. The EPA Office of Environmental Education is concentrating on educational programs in urban areas to target segments of the population that are not being reached, such as minority and multi-ethnic communities, senior citizens, and illiterate persons.

Partnerships with State and Local Governments

Many state and local governments have environmental education programs in place that can serve as models for other locales. OEE is collaborating with public agencies at all levels to disperse information, reinforce consistent messages, and minimize duplication of effort.

Partnerships with Academia

Liaisons with colleges and universities helps keep federal agencies informed on current research and innovative methods of environmental education. OEE is using grant programs to fund environmental initiatives at institutions of higher education.

Partnerships with Senior Citizen Groups

Many senior citizens have the time to take part in environmental education programs of benefit to their communities. OEE is contacting senior citizens organizations, especially retired educators, to enlist their support in carrying out environmental education projects that reach all segments of society.

Goal 3. Increase the number and skills of teachers who infuse environmental issues into their curricula.

Federal agencies are supporting the development of training

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programs and materials to ensure that all teachers, including those in nonscientific fields, have the opportunity to receive training and materials that will allow the infusion of environmental education into their curricula.

Teacher-Training Grants. In 1992 EPA awarded a \$1.6 million grant to a consortium of academic institutions, corporations, and non-profit organizations headed by the University of Michigan to develop and operate a national environmental education and training program. The program targets in-service teachers (K-12) as well as non-formal educators and includes curriculum development and evaluation, teacher training, and information dissemination.

Wetlands Education. The Fish and Wildlife Service, in cooperation with the U.S. Geological Survey, has produced an educational poster for elementary and middle school teachers entitled, "Wetlands: Water, Wildlife, Plants and People." It features color aerial views of various types of wetlands and on the back has lesson plans and classroom activities. FWS has distributed 200,000 copies to staff, other federal agencies, private organizations, and educators throughout the United States. Sciencescope and Science for Children, publications which circulate to 90,000 teachers, featured the poster as a special pullout in their September 1992 issues. Copies are available from USGS.

Pollution Prevention. The EPA Pollution Prevention Task Force, an external advisory group, is developing a teacher-training plan and educational materials. With guidance from the task force

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and input from teachers and environmentalists, EPA has designed materials for grades K-12. The project complements the national program being developed by the University of Michigan consortium and may be incorporated into it.

Parks as Classrooms. Through this initiative, the National Park Service enters into partnerships with local schools to develop curricula and provide educational services to park visitors. In 1992 NPS supported 41 projects with funding of \$780,000. Training courses emphasizing cultural, heritage, and environmental themes help prepare interpreters to develop NPS educational programs. Other projects include curriculum development and an exchange-education project developed by the Everglades National Park involving two schools, one in Miami and the other in Chicago.

Heritage Program. BLM has designed an educational program for school children to strengthen their sense of personal responsibility for the stewardship of America's cultural heritage. In 1992 BLM launched the program with an educational video, featuring the Teenage Mutant Ninja Turtles. Two articles on the program appeared in Science and Children, a professional magazine for science teachers, and BLM took part in seven partnership projects to publicize the program.

Goal 4. Encourage and support grassroots efforts.

Because innovative grassroots projects can be particularly responsive to local needs, federal agencies are supporting

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environmental education efforts at the local level. In 1992 OEE awarded \$2.4 million in grants to schools, states, and non-profit organizations to support environmental education projects around the country. Individual grants ranged from \$211,000 to \$250,000, with the majority at less than \$5,000. Some projects focus on specific issues such as water, air, and solid waste management, while others emphasize general environmental education either locally or globally. Educational approaches range from community cleanup to computer games. EPA selected projects for their innovation and applicability in other communities, soliciting grant applications in the fall of each year by means of notices in the Federal Register.

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Environmental Education Grants

The following are examples of over one hundred environmental education grants awarded by EPA in 1992 under the National Environmental Education Act:

- **Nature in a Nutshell.** The Fish and Wildlife Service provided the San Angelo Nature Center in Texas with a grant for \$24,000 to support Nature in a Nutshell, an education and outreach program. The program, established in 1990, receives support from the Junior League, San Angelo Independent School District, and Coca Cola Bottling Company. It has reached 4,000 public and private school students with educational programs about the Edwards Plateau ecosystem.
- **Millions of Trees.** The Napa Valley Unified School District in California received a \$16,835 grant to fund this project, in which students raise living Christmas trees and a variety of native plants that are later used to reforest local areas.
- **If Everyone Lived Like Me.** The Elachee Nature

Science Center and Creative Museum in Georgia received an \$87,500 grant to create an interactive video software program for school children and adults to educate consumers to reduce global pollution.

- **Waste Not, Want Not.** The Colo-Nesco Community School in Iowa received a \$5,000 grant to help equip students to assess environmental issues and to foster international cooperation by addressing such issues.
 - **Seed-to-Table Farm Stewardship Exhibit.** Maine Organic Farmers & Gardeners Association received a \$5,000 grant to prepare a walk-through exhibit for display at public events in New England. Models, games, stories, photos, and performers demonstrate farming practices to protect natural ecosystems.
 - **Building a Wetlands.** The Howard County Public School System in Maryland received a \$22,440 grant to create a wetlands using recycled materials and to develop study areas and curricula for school and community use.
-

Goal 5. Promote careers in the environmental field.

As the public becomes more aware of global environmental problems, federal agencies are increasing support for environmental research. The nation needs environmental scientists, engineers, and other professionals capable of developing preventive solutions to environmental problems. EPA promotes environmental careers and encourages participation of minority students in environmental degree programs through a number of programs, such as the following:

Internships and Fellowship. EPA administers programs that place college interns and in-service teachers in federal agencies active in environmental education. Internships encourage college

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students to pursue careers in environmental science, and fellowships encourage teachers to take their environmental experience back into the classrooms, thereby educating students about the environment and promoting the pursuit of environmental careers.

NOAA administers the Dean John A. Knauss Marine Policy Fellowship that annually supports up to 25 graduate students in the Sea Grant College Program Network for one year of educational experience in Washington, D.C. Federal agencies or Congressional staffs host the fellows, who work on assignments related to the marine environment.

President's Environmental Youth Awards. Young people in all 50 states compete annually in this program which honors outstanding commitment to the environment. National award winners, selected by EPA regional offices, participate in a recognition program in Washington, D.C. Since 1989 President Bush has hosted ceremonies at the White House to honor the ten annual award winners.

National Environmental Education Awards. A new federal awards program creates the following awards to recognize individuals for their contributions to environmental education:

- **Theodore Roosevelt Award** for an outstanding career in environmental education, teaching, or administration;
- **Henry David Thoreau Award** for outstanding literature on the natural environment and pollution problems;
- **Rachel Carson Award** for an exceptional print, film, or

President's Environmental Youth Awards, 1992.

Recipient	Location	Project
Lafayette Regional School	Franconia, New Hampshire	"GreenKids": environmental education and activism.
Solomon Schechter Day School	Commack, New York	"Project C.R.E.A.T.E. (Children Recycling, Acting to save the Environment)": environmental education and activism.
Aaron Cohen	Upper Darby, Pennsylvania	"Recycling Awareness Week": recycling and reuse.
Blue Ridge Elementary School	Evans, Georgia	"Conservation Through Education - The 3 R's (Recycling, Restoring the Environment, and Regenerating a Love and Appreciation of the Earth)": environmental activism.
Rachael Hastings	Rochester Hills, Michigan	Science project: monitoring and improving local water quality.
Becker Elementary School	Austin, Texas	"The Green Classroom": pollution prevention and education.
Elisabeth Reba Clubine	Carthage, Missouri	Water quality project: conservation, aquatic science, and stream clean-up.
Hygiene Elementary School	Hygiene, Colorado	"Tropical Discoveries": environmental education, conservation.
Memorial Academy	San Diego, California	"Energy Club": environmental education, recycling, energy efficiency.
Willow Elementary School	Willow, Alaska	"The Kid Log Company": recycling and conservation.

Source:

U.S. Environmental Protection Agency, 1992.

broadcast contribution to public education on environmental issues; and

- **Gifford Pinchot Award** for an outstanding educational contribution to forestry and natural resource management.

President's Environment and Conservation Challenge Awards.

CEQ, working with private-sector partners, manages this program to recognize U.S. citizens and organizations for outstanding contributions to the nation's environmental quality. One of the four award categories is Education and Communications, in which Presidential medals are awarded for developing informational programs that inspire respect for the environment and raise the public's environmental awareness.

National Network for Environmental Management Studies. NNEMS provides fellowships or paid internships to students in exchange for written studies or reports on environmental science, policy, and management in areas of concern to EPA. Most recipients are students conducting master or doctoral research.

Goal 6. Provide educators and the public with access to appropriate environmental education materials.

A quantity of environmental education materials exists, but quality varies and finding appropriate materials can be difficult. To categorize and provide access to the best materials available, EPA has the following efforts underway:

Clearinghouse. To facilitate information exchange, EPA is developing an interactive computer system for environmental education materials produced by federal agencies and other organizations. EPA is testing the clearinghouse, designed for educators (K-12), during the 1992-1993 school year and plans to have it available to the public for the 1993-1994 school year.

Earth Notes. This quarterly periodical, published by the EPA Office of Environmental Education, contains innovative ideas from educators (K-6) about their first-hand experiences in bringing environmental education into the classroom. The periodical provides an open forum for the exchange of teaching ideas, comments, and brief essays concerning environmental education in the elementary grades.

Goal 7. Educate the general public to make informed decisions.

Federal agencies are improving their ability to communicate complex scientific and technical information to the public. To produce informed citizens capable of making informed decisions to protect the environment, federal agencies are sponsoring projects such as the following;

Media Strategy. EPA is developing a media strategy that federal agencies can use to reach the general public with information about actions that individuals can take to make a difference in the environment. The strategy enlists the help of private partners and the media, including press, television, and

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radio.

Marine Environmental Outreach. In 1992 the U.S. Coast Guard developed an outreach program for the general public and the marine industry. The campaign, scheduled for implementation in early 1993, will raise awareness of regional, national, and international marine pollution issues impacting U.S. waters. To improve relations with private groups, the Coast Guard will publish a Marine Environment Protection Strategy and a newsletter with updates on such topics as plastics in the marine environment, spill-reporting mechanisms, and the unintentional introduction of nonindigenous aquatic species into U.S. waters by ship ballast discharges.

Sea Grant Marine Advisory Service. The NOAA Sea Grant Network sponsors public education/outreach programs that utilize a network of extension professionals in every coastal state. The programs target teachers, state and local policymakers, industrial leaders, and the general public. Educational efforts promote appropriate strategies to protect and wisely use aquatic resources.

Goal 8. Reach beyond national boundaries.

Because environmental risks transcend political boundaries, international information exchanges and joint training ventures have become an environmental education priority, and federal agencies are supporting initiatives around the world.

Sport Fishing Education. Under provisions of the Federal Aid

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in Sport Fish Restoration Act, up to 10 percent of federal funds apportioned by the Fish and Wildlife Service to the states may be used for aquatic resources education. Such programs can include aquatic ecology, aquatic resources management, aquatic safety, conservation ethics, and fishing. The audience is U.S. fishermen and fishermen from other nations fishing in U.S. waters.

Trilateral Memorandum of Understanding. The United States developed a Trilateral Memorandum of Understanding on Environmental Education in cooperation with the governments of the Canada and Mexico to promote environmental education on the North American continent. Educational activities may include information exchanges on educational policies, approaches, and materials; support and participation in seminars, workshops, and conferences; and trilateral initiatives involving the environmental education of youth.

Fulbright Fellowships. The U.S. Information Agency and EPA are developing Fulbright Fellowships for senior research scholars in environmental research and education from the Near Eastern, North African, and South Asian regions. Senior scholars will be eligible for 9-month to 1-year grants to further their environmental studies at an institution of higher education.

International Public-Private Partnerships. Federal agencies are supporting public-private initiatives to promote environmental education in various regions of the world. For example, EPA is sponsoring the Regional Environmental Center for Central and

Eastern Europe, initiated in 1990 in Budapest, Hungary; the Caribbean Environment and Development Institute, initiated in 1992 in Puerto Rico; and the Environmental Education and Information Center, initiated in 1992 in Kiev, Ukraine.

The Department of the Interior also is assisting the government of Hungary in developing a free-market-based mineral development program. Assistance includes training in process and techniques for assessing the potential environmental effects of mineral development. The objective is to provide the basic tools for including consideration of environmental values in decisionmaking.

ENERGY

Also see Federal Facilities Management, Environmental Technology, Transportation, and related tables and figures in Part II.

The quality of the environment has become closely linked to energy use. In 1992 the federal government began implementing energy initiatives to improve environmental quality, stimulate economic growth, and improve energy security. The basis for the initiatives is the National Energy Strategy (NES), issued by the Bush administration in February 1991 as a blueprint for the energy future of the United States. During 1991 and 1992 the federal government introduced over 90 NES initiatives, including the following:

- Expanded energy efficiency and renewable energy programs,
- Increased funding for advanced transportation technologies,
- Expanded interagency efforts in the U.S. Global Change Research Program, and
- Partnerships among federal agencies, industries, and states to reduce energy and water use.

The National Energy Strategy Act of 1992, enacted by Congress and signed by President Bush in October 1992, will allow

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full implementation of a balanced, pro-environment, pro-growth national energy strategy.

Conditions and Trends

Energy is essential for economic production and the high standard of living Americans enjoy. Over the past two decades, the nation has learned to use energy more efficiently in every sector. The United States uses 10 percent more energy today than it did in 1973, yet there are 30 percent more homes, 50 percent more vehicles, and the gross domestic product is 50 percent higher. The challenge is to produce and use energy more efficiently and cleanly. Full implementation of NES promises to improve the way the United States produces and uses energy.

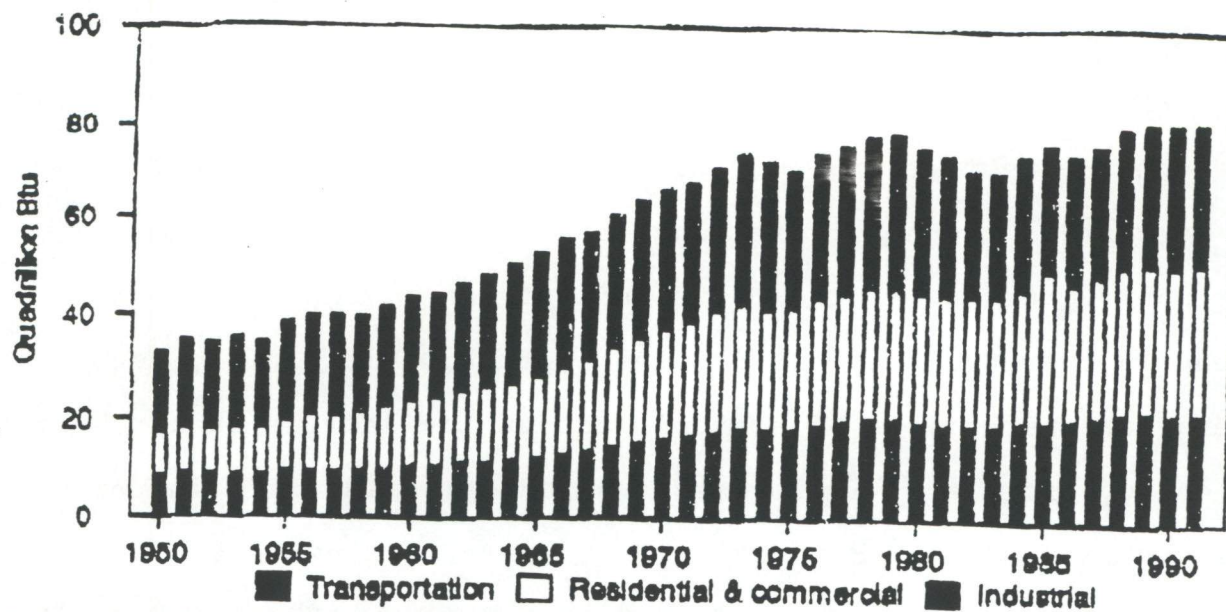
Energy Consumption

Americans depend on energy to produce goods and services in the following end-use sectors:

Residential and Commercial. This sector accounts for 36 percent of U.S. end-use energy consumption; 35 percent of which is currently in the form of electricity. As the number of electrically heated and cooled homes and buildings expands, the Department of Energy (DOE) expects residential and commercial demand for electricity to rise to over half the total end-use energy demand for this sector by the next century.

Industry. Industry accounts for another 36 percent of end-

U.S. energy consumption, by end-use sector.



Sources: U.S. DOE, Energy Information Administration, Annual Energy Review 1991, table 9, p. 27, DOE/EIA-0384(91), (Washington, DC: DOE, EIA, 1992).

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use energy consumption, relying on a mix of fuels. Industry uses 70 percent of the energy it consumes to provide heat and power for manufacturing. DOE expects industry energy demand to grow steadily over the next two decades. During this period, however, energy use per dollar of economic output may decline as a result of energy efficiency improvements. Industry also will increase its generation of electricity and steam for its own use.

Transportation. The United States devotes 27 percent of its energy consumption to the transport of people and goods. Virtually all of this energy consists of petroleum products used to power automobiles, trucks, ships, airplanes, and trains. The transportation sector accounts for two-thirds of U.S. petroleum use. While the number of alternative-fueled vehicles will rise in the future, petroleum fuels likely will continue to dominate transportation energy use for the next 20 years.

Energy Production

U.S. domestic energy resources are extensive and diverse, with coal, oil, natural gas, and uranium found in significant quantities within U.S. borders. Unconventional sources, such as coal-bed methane, are also potential future energy sources. Renewable energy sources, such as geothermal, solar, and wind, are available and limited only by the cost-effectiveness of technologies to harness them.

The value of electricity to the U.S. economy continues to

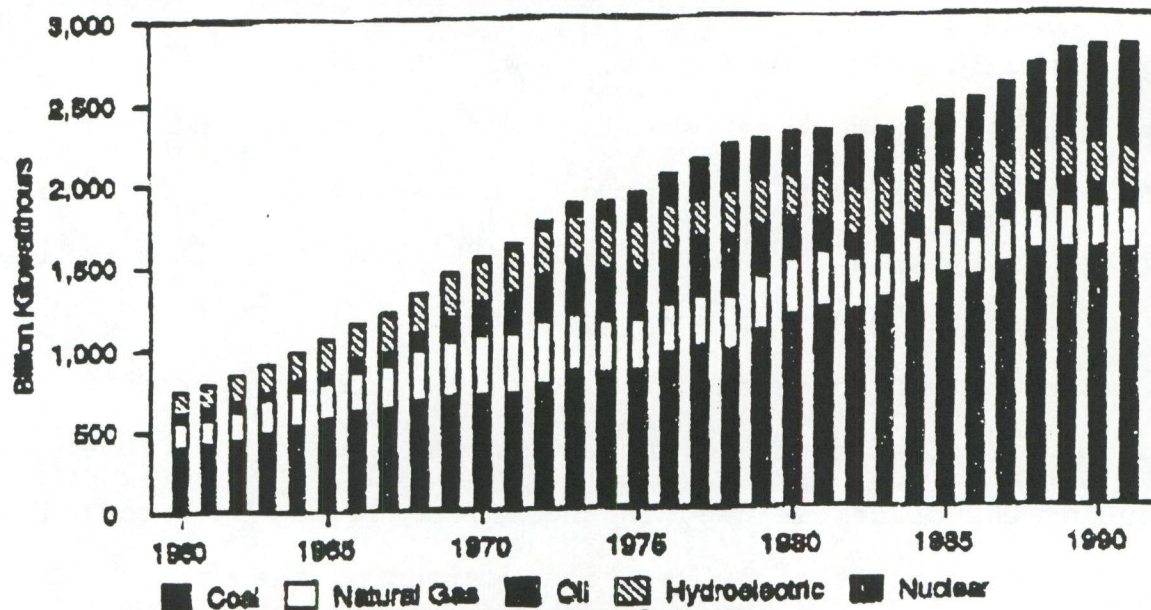
increase. By 2010 DOE estimates that 41 percent of the primary energy consumed in the United States will be used to generate electricity, up from 36 percent in 1992. The nation currently uses coal to generate 55 percent of the electricity it consumes; nuclear power supplies 20 percent; and the remainder is generated from oil, natural gas, and renewable energy.

Petroleum. Production of crude oil and refined products accounts for a fourth of U.S. annual energy production. Over 40 percent of the crude oil used in the United States is imported--much of it from politically volatile regions of the world such as the Persian Gulf, which holds two-thirds of known global oil reserves. DOE expects demand for petroleum to increase, even if petroleum prices increase significantly. U.S. production of crude oil, however, is on a steady decline, which will mean greater use of imports in the future to meet demand.

Natural Gas. Natural gas accounts for another fourth of U.S. annual energy production. Natural gas reserves are found in several areas of the United States, and supplies are transported via pipeline. DOE expects consumption of natural gas to increase considerably over the next 20 years, with the bulk of gas demand met by domestic supplies.

Coal. American coal reserves are the largest in the world and supply a fourth of U.S. energy consumption. Nearly nine-tenths of domestic coal use is for electricity generation at large power stations. DOE expects consumption of coal for

Sources of U.S. electricity



Source: U.S. DOE Energy Information Administration, Annual Energy Review 1991, table 22, p. 211, DOE/EIA-984(21), (Washington, DC: DOE, EIA, 1992).

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electricity generation to grow as demand for electricity rises over the next two decades.

Nuclear. Nuclear power supplies 20 percent of all U.S. electricity generation. While eight plants were under construction in 1992, no new nuclear powerplants are on order, primarily because of regulatory uncertainty, costs, and concern over nuclear waste disposal and safety. Unless these issues are resolved, the contribution of nuclear power to national energy needs is unlikely to increase.

Renewables. Renewable energy sources, including hydropower, solar, biomass, municipal wastes, wind, and geothermal energy, provide less than 10 percent of U.S. annual energy production, with hydropower as the leading source. Although half of U.S. renewable energy goes to generate electricity, the nation uses biofuels for transportation and solar energy to heat buildings and water. Over the next 20 years, DOE expects the use of renewable fuels to increase to meet more than 11 percent of U.S. energy demand.

Environmental Impacts

Over the last two decades, the United States has reduced energy-related air pollutant emissions, primarily with controls mandated by the Clean Air Act. The Clean Air Act Amendments of 1990 promise further reductions.

Lead. Between 1970 and 1990, emissions of lead declined 97

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percent as a direct result of its removal from gasoline.

Particulate matter and sulfur dioxide. Over the same period, nationwide emissions of particulate matter (PM) decreased by 59 percent and sulfur dioxide emissions decreased by 26 percent. Such decreases resulted primarily from stringent controls on industrial processes and on such fuel combustion sources as electric utilities and industrial, commercial, and residential boilers. A quarter of the PM decline and a third of the sulfur dioxide decline resulted from controls on coal-fired fuel combustion sources.

Nitrogen oxide. In conjunction with an 83-percent increase in electricity generation between 1970 and 1990, nitrogen oxide emissions from electric utilities increased by 67 percent.

Carbon monoxide and volatile organic compounds. A nationwide 41-percent decrease in carbon monoxide and 25-percent decrease in volatile organic compounds resulted primarily from controls on new motor vehicles.

Carbon dioxide. In 1988 U.S. carbon dioxide emissions totaled 1.3 billion metric tons, a 20-percent increase over 1970 and a reflection of the increase in population and energy use in that period. During the same period, the contribution of coal to total carbon dioxide emissions increased from 22 percent to 38 percent.

Policies and Programs

The National Energy Strategy Act of 1992 could change the American way of life by improving energy efficiency, ensuring the availability of energy supplies, and improving environmental quality. In 1992 the Bush administration implemented over 90 NES initiatives and expanded energy assistance to state and local governments. Federal agencies also reported progress in implementing the President's Executive Order on Federal Energy Management (for more information, see the Federal Facilities Management section). The following are highlights of progress made in 1992.

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National Energy Strategy

The National Energy Strategy (NES) lays the foundation for a more efficient, less vulnerable, and more environmentally sustainable energy future. With maximum reliance on markets as a keystone of the strategy, NES initiatives address five interlocking areas:

- **Energy Security.** When fully implemented, NES will render the nation less prone to economic damage from sharp fluctuations in either the supply or price of petroleum.
- **Energy and Economic Efficiency.** NES initiatives aim to lower energy costs to consumers, reduce energy-related emissions, maintain or enhance standards of living, and promote a strong economy.
- **Energy Supplies.** To secure future energy supplies, NES calls for greater use of renewable energy resources; reliance on low-emission energy sources such as natural gas; development of a new generation of safer nuclear technologies; and continued development of domestic coal and oil supplies in an environmentally responsible manner.
- **Environmental Quality.** Initiatives will increase the efficiency of energy-producing and consuming

technologies, reduce solid and hazardous wastes, and improve energy-related practices.

- **Technology and Competitiveness.** NES initiatives fortify U.S. foundations in science and engineering research, technology development, and education; establish federal research and development priorities; strengthen research in universities, industries, and international collaboratives; accelerate technology transfer from federal laboratories to private industry; and enhance U.S. mathematics, science, technology, and engineering education.
-

Superclean Coal and Liquid Fuels

In 1991, in the fourth round of the Clean Coal Technology (CCT) Program, DOE added nine demonstration projects for co-funding with industry. Of the 42 current CCT projects, 3 have been completed, 10 are in operation, 9 are under construction, and 20 are in the preconstruction design phase. The first four rounds of CCT represent a federal research and development (R&D) investment of \$2 billion and an industry investment of \$3 billion. The President's fiscal 1993 budget requests \$500 million to funding the fifth round of the CCT program.

In 1992 DOE focused its coal R&D program on the super-clean high-efficiency power generation systems needed for coal to compete as an energy source under stringent environmental requirements scheduled to take effect after 2000. The goal is production of high-quality coal-derived liquid fuels competitive with oil priced at less than \$30 per barrel.

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Renewable Energy

The President requested fiscal 1993 funding for renewable energy R&D at \$250 million, a 65-percent increase over funding in fiscal 1989, the first year of the Bush administration. Increased R&D will accelerate development of emerging renewable energy technologies, reduce costs, improve performance, and make these technologies more competitive in the marketplace.

National Renewable Energy Laboratory. In September 1991 the President designated the Solar Energy Research Institute in Golden, Colorado, as the National Renewable Energy Laboratory. By elevating this facility to national laboratory status, the Bush administration demonstrated a commitment to renewable energy technology.

Solar Thermal Power. In October 1991 DOE entered into a joint venture with a U.S. engine manufacturer to develop a system that uses solar energy to operate a stirling generator capable of providing 5 kilowatts of electricity at an estimated cost of 15 cents per kilowatt hour. This system, scheduled for commercialization in five years, could replace remotely located diesel engines for electricity generation worldwide. The President requested \$27 million for solar thermal R&D in the fiscal 1993 budget.

Wind Energy. DOE completed construction of a full-scale blade-and-materials fatigue testing facility at the Wind Energy Test Center at Boulder, Colorado. The wind energy industry uses

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the center to test improvements aimed at increasing the durability and life of wind turbines. Through R&D at the National Renewable Energy Laboratory, DOE demonstrated a 15- to 30-percent improvement in the performance of wind turbine airfoils compared with those currently available. With such advances in technology, wind energy is on the verge of becoming a competitive resource for electricity generation in many areas of the country. The President requested \$22 million for wind energy R&D in the fiscal 1993 budget.

Alternative Fuels

The President's fiscal 1993 budget proposed \$15 million to accelerate the acquisition of new vehicles that operate on fuels other than gasoline and the conversion of current vehicles. Funding would allow the purchase and conversion of an additional 5,000 alternative-fuel vehicles (AFVs). For more information on AFVs, see the Federal Facilities Management section.

U.S. Advanced Battery Consortium. In October 1991 the President announced a 4-year \$260 million joint research venture with the nation's three largest automakers and others to develop a new generation of batteries for high-performance electric vehicles. These new batteries will be lightweight and capable of significantly increasing the range of electric vehicles. This government-industry effort to address a major technological challenge is strengthening the U.S. position in the international

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competition for electric vehicle development.

Hybrid Vehicles. Proposed 1993 funding of \$20 million would create a new government-industry consortium for hybrid-vehicle technology, based on the model of the Advanced Battery Consortium. This new generation of vehicles would use batteries in combination with other systems, such as fuel cells or gas turbines.

Biofuels. Proposed 1993 funding for DOE biofuel R&D for transportation was \$48 million, a 35-percent increase over fiscal 1992 and a 60-percent increase over 1991. In 1991 the departments of Energy and Agriculture signed a memorandum of understanding to coordinate federal efforts in the area of biomass research. The National Renewable Energy Laboratory signed a cooperative R&D agreement with a corn-ethanol producer to test a process that converts corn cellulose into ethanol. DOE signed a similar cooperative agreement with a major oil company to explore ethanol production from waste paper.

Industrial Waste Minimization

DOE has published a multi-year plan for support of industrial waste minimization technologies. The Department supports technology R&D cost-shared with industry to reduce waste and save energy. In 1991 DOE and industry representatives signed the first cooperative R&D agreement to reduce wastes associated with industrial soldering operations. In 1992 DOE and the

Environmental Protection Agency (EPA) initiated discussions on ways to minimize industrial waste through regulations designed to encourage technology development. In cooperation with the industry-based Center for Waste Reduction Technologies, DOE identified R&D requirements to exploit waste reduction opportunities in industry, with an emphasis on chemical production and use.

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Energy and Global Climate Change

Despite uncertainties, scientific evidence suggests climatic impacts from the buildup of heat-trapping greenhouse gases in the atmosphere. Energy production and use may contribute 57 percent of the emissions related to potential global climate change.

Consistent with the 1990 report of the U.N. Intergovernmental Panel on Climate Change, the United States has developed cost-effective programs to provide economic and environmental benefits while reducing or restraining greenhouse gas emissions.

Action Strategy. In February 1991 the United States was the first nation to present a detailed climate change strategy of action, with projected greenhouse gas emission reductions. Actions will result in estimated reductions of greenhouse gas emissions in 2000 to equal or below 1987 levels, on a carbon dioxide equivalent basis.

In 1992 the United States updated its Climate Change action plan, adding actions that could reduce net greenhouse gas emissions in 2000 by 125 to 200 million metric tons of carbon dioxide equivalent below previously projected levels. CFC emissions were not included in the calculations because of recent scientific findings that question the global warming effect of these gases. The U.S. strategy includes the following actions to directly limit greenhouse gas emissions:

- Regulation of emissions of volatile organic compounds (VOCs), carbon monoxide, and nitrous oxides, pursuant to the Clean Air Act Amendments of 1990;

- Proposed regulation of landfill methane;
- Reductions in nitrous oxide emissions from nylon manufacturing.

The President's tree-planting initiative would increase the sequestering of carbon dioxide by trees, and the following energy-efficiency efforts would further reduce emissions:

- Greater use of mass transit in transportation;
- Increased use of natural gas,
- More energy efficient residential and commercial buildings,
- Improved efficiency in the generation of electricity.
- Efforts such as the EPA Green Lights program for energy efficient lighting (see Pollution Prevention section).

U.N. Framework Convention. The United States participated in negotiations and was a signatory to the U.N. Framework Convention on Climate Change adopted and signed by 134 nations at the U.N. Conference on Environment and Development (UNCED) in June 1992. The treaty seeks to protect the climate by precautionary, cost-effective measures that prevent or minimize the causes of climate change and to mitigate adverse affects. The convention promotes a supportive international economic system that would lead to growth and development, particularly for developing countries.

Energy Conservation and Efficiency

The President proposed increased funding for energy conservation R&D in the fiscal 1993 budget with a request of \$330 million. This represents a doubling of DOE conservation R&D funding since 1989.

Industrial Energy Audits. In 1991 DOE opened five additional Energy Analysis and Diagnostic Centers (EADCs) at U.S. universities, bringing the total to 18. To date, 3,600 EADC audits, conducted at a cost of \$18 million, have resulted in \$400

million in energy savings to industry. DOE has initiated discussions with industries, states, and electric and natural gas utilities on ways to improve industrial energy audit techniques. The Department is participating with the Electric Power Research Institute and several utilities in an audit program for selected large industrial firms. Industrial energy audits are a first step in determining where efficiency improvements are most desirable and cost-effective.

Energy-Efficient Buildings. DOE expanded support for R&D on a range of energy-efficient building technologies. Working with the Department of Housing and Urban Development on a DOE-HUD Initiative for Energy Efficiency in Housing, DOE funded efforts to increase energy efficiency in HUD-aided housing and to help reduce utility costs of \$2 billion per year. Areas of interest include home energy rating systems, energy-efficient mortgages, energy performance contracting in public housing, energy standards for manufactured housing, and guidelines for making Indian housing more energy efficient.

Integrated Resource Planning. DOE also expanded Integrated Resource Planning (IRP) to develop better analytical capabilities and to support state and local resource planning programs. The Department is evaluating 50 proposals from utilities and state regulators in response to a solicitation issued through the DOE Oak Ridge National Laboratory for IRP research.

Community Energy Systems. In 1992 HUD funded localities

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performing feasibility studies on preliminary designs for potential Community Energy Systems. Such systems provide reasonably priced energy for heating and cooling to businesses, industries, and residences. The goal is to foster community and economic development, maximize fuel efficiency, and reduce pollution.

Energy Production

During 1992 DOE received proposals for developing the Alaskan North Slope and for Outer Continental Shelf leasing.

Alaskan North Slope Development Task Force. In 1992 the interagency Task Force on Alaskan North Slope Development considered state and federal actions to reduce regulatory and technical barriers to environmentally responsible development of the northern Alaska. Such barriers include restrictions on causeway and pipeline construction and difficulties in recovering heavy oil at low temperatures. The targeted fields have the potential to yield 1 billion barrels of oil.

Outer Continental Shelf Leasing. In February 1991 the Department of the Interior issued a draft proposal for a 5-year 1992-1997 leasing plan. The proposal reflects the President's call for a more targeted OCS leasing program fully supported by scientific studies and sensitive to the concerns and needs of local areas. The plan would increase efforts to gather information on environmental and natural resources and to respond

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to the views expressed by states, local governments, and the public.

National Technology Initiative

In February 1992 the federal government launched the National Technology Initiative (NTI), with participation by DOE, the Department of Commerce, the National Aeronautics and Space Administration (NASA), and the Department of Transportation. NTI promotes rapid commercialization of advanced technologies, including energy and environmental technologies. NTI has sponsored ten regional NTI conferences to highlight opportunities for partnerships among federal agencies, universities, and the private sector on cooperative R&D, financing, and manufacturing. Five additional conferences are scheduled, and, in response to industry interest, DOE and EPA are organizing follow-on workshops.