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NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) is the nation's environmental magna carta. With passage of NEPA in 1969, the United States adopted a national policy to "encourage productive and enjoyable harmony between man and the environment" and to direct federal agencies, to the fullest extent possible, to interpret and administer U.S. policies and laws in accordance with this policy. NEPA established the Council on Environmental Quality (CEQ) to advise the President and assist federal agencies with compliance, and the act mandated procedural requirements to fulfill its substantive goals.

Conditions and Trends

To help ensure that consideration of environmental values is systematic in federal decisionmaking, NEPA section 102(2)(C) requires preparation of a "detailed statement" for "major federal actions significantly affecting the quality of the human environment." The "detailed statements" have come to be called environmental impact statements (EIS) and the process underlying the preparation of those statements by federal agencies has come to be called the environmental impact assessment or NEPA process.

CEQ has promulgated regulations to implement the procedural provisions of NEPA (40 CFR Parts 1500-1508). The primary purpose of these regulations is to ensure that federal agencies consider

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the substantive goals of NEPA in the course of decisionmaking and that the public and environmental agencies are involved in that process.

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NEPA Glossary

The National Environmental Policy Act of 1969 (NEPA) requires federal agencies to consider the environmental impacts of major federal actions, weigh alternatives, and seek public participation early in the planning process. The following are terms introduced by NEPA regulations promulgated by CEQ:

- **Environmental Assessment (EA).** This concise public document analyzes the environmental impacts of a proposed federal action and provides sufficient evidence to determine the significance of impacts.
- **Findings of No Significant Impact (FONSI).** This public document briefly presents the reasons why an action will not have a significant effect on the human environment and therefore will not require the preparation of an environmental impact statement.
- **Environmental Impact Statement (EIS).** This is the "detailed statement" required by NEPA when an agency proposes a major federal action that significantly affects the quality of the human environment. An EIS must include an analysis of reasonable alternatives to the proposed action.
- **Record of Decision (ROD).** This public document reflects an agency's final decision, rationale behind that decision, and commitments to monitoring and mitigation.
- **Cumulative Impact.** This impact on the environment results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Over the years, some observers have come to associate NEPA implementation more with documentation of environmental analysis than with the substance of the analysis itself. However as CEQ regulations state:

Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork--even excellent paperwork--but to foster excellent action.

The purpose of NEPA then is protection of the environment, not production of paperwork. Many federal agencies are striving to better integrate NEPA goals with their own policies and actions. To recognize and encourage such efforts, CEQ initiated the Federal Environmental Quality Awards program in 1992 to showcase model NEPA compliance in two categories:

- Exemplary Action Award, based on a specific example of an environmental impact analysis; and
- Exemplary Agency Award, presented to the agency that best demonstrates a consistently high standard of performance in the NEPA process.

CEQ asked each federal department to nominate one exemplary action and one agency within that department. The Environmental Protection Agency (EPA) also nominated agencies in both categories based on its experience in reviewing environmental impact analyses.

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Federal Environmental Quality Awards

In November 1992 [CONFIRM AT PRESS TIME] the President's Council on Environmental Quality (CEQ) announced the first recipients of the Federal Environmental Quality Awards established to showcase model compliance by federal agencies with the National Environmental Policy Act (NEPA). The following federal action and federal agency received awards:

- o Exemplary Action Award. [ADD PARAGRAPH ON WINNING PROJECT]
 - o Exemplary Agency Award. [ADD PARAGRAPH ON WINNING AGENCY]
-

Policies and Programs

As part of its NEPA oversight responsibilities, CEQ sponsored a number of initiatives during 1992. A sampling follows.

NEPA Regional Conferences

During 1991 and 1992 CEQ hosted five regional conferences that focused on ecological issues in NEPA analyses. The conferences, cosponsored by EPA with assistance from the Department of Defense and the Fish and Wildlife Service, were held in Denver, Atlanta, Boston, Chicago, and Anchorage. They afforded CEQ the opportunity to meet with NEPA practitioners in the field to discuss methods for implementing national policies that relate to conserving biodiversity. Experts in biodiversity conservation spoke at each conference, and NEPA practitioners presented papers and case studies on methods of incorporating ecological principles into the NEPA process. Methods include

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geographic information systems (GIS) and data available through The Nature Conservancy's Natural Heritage Program. In addition, CEQ devoted a segment of each conference to the purpose, theory, and practice of preparing environmental assessments. After reviewing information gained from the conferences, CEQ will issue a report on biodiversity in NEPA analyses. CEQ intends to issue guidance to the federal agencies on NEPA consolidation in the EA process.

Environmental Assessment Survey

In 1992 CEQ surveyed federal agencies to determine whether EAs are facilitating effective NEPA compliance. The survey, which recorded 45,000 EAs prepared during the year, also showed that while the EA process often facilitates mitigation, many agencies do not use EAs as originally envisioned by the regulations in three significant respects:

- Agencies rarely use an EA to determine whether an EIS is necessary;
- Agencies prepare EAs that are often quite lengthy and correspondingly costly;
- Agencies appear to rely heavily on mitigation measures to justify EAs and FONSIs.

The survey results suggest that some agencies have avoided preparing EISs based on the erroneous perception that preparation

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of EAs does not require public involvement. However, the results also indicate that increased reliance on EAs may be attributed in part to early NEPA integration in agency planning, which results in mitigation measures being incorporated into a project site and design, with adverse environmental effects consequently reduced or eliminated. The survey results are available in their entirety from CEQ.

Cumulative Impact Analysis

While most federal managers recognize the need to assess the cumulative impacts of agency actions, EISs are often limited in scope. As a result, EISs frequently miss the big-picture effects of individual proposals, and litigation ensues. While a consensus exists on the need to evaluate cumulative effects, federal agencies do not all agree on the methodology or conceptual approach to that analysis.

To promote dialogue on this issue, CEQ hosted workshops to develop methodological approaches to cumulative impact analysis and is collecting case studies on how agencies conduct analyses. A handbook in preparation will incorporate different agency approaches. CEQ also is working with the Canadian Federal Environmental Assessment Review Office to share information regarding approaches to cumulative impact analysis.

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International Activities

CEQ is involved in several interagency efforts regarding environmental impact assessment (EIA) in the international context.

Protocol on Environmental Protection. CEQ helped to develop legislation for the Protocol on Environmental Protection signed in 1991 by the United States and other Antarctic Treaty parties. The Council also worked with the National Science Foundation to draft EIA regulations to implement the Protocol.

Pelosi Amendment. CEQ is involved in an interagency process to ensure that, pursuant to the Pelosi Amendment (22 U.S.C. 262m), the U.S. executive director of each multilateral development bank abstains from voting on loan proposals that have a significant impact on the environment unless the proposal is accompanied by an environmental assessment or comprehensive environmental summary received at least 120 days before the board votes on the proposal.

Convention on Environmental Impact Assessment in a Transboundary Context. In February 1992 the United States signed the Convention on Environmental Impact Assessment in a Transboundary Context, which was negotiated under the auspices of the Economic Commission for Europe. CEQ is developing guidelines to implement the Convention for projects with significant adverse transboundary environmental impacts.

Technical Assistance. Other countries frequently ask CEQ to

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assist them in formulating an EIA process. In 1992 CEQ staff met with delegations from Russia, Spain, Cameroon, Malawi, Egypt, Korea, China, Japan, France, and Italy, among others, to discuss the NEPA process and its role in federal decisionmaking. In addition, a CEQ attorney assisted officials from the Turkish Ministry of the Environment in drafting EIA procedures.

NEPA Training

In 1992 CEQ undertook a NEPA training initiative to ensure that quality NEPA education and training are available across the country. As part of the initiative, CEQ compiled a compendium of NEPA courses currently offered by federal agencies, universities, and private entities (see Appendix). A sampling of those in which CEQ took part follows.

Justice Department Course. In February 1992 the Legal Education Institute of the Department of Justice (DOJ), assisted by CEQ, presented a NEPA course designed for government lawyers in Washington, D.C. The course is being offered again in January 1993 in Seattle, Washington.

University Short Courses. In November 1992 CEQ cosponsored an annual week-long NEPA course at the Duke University School of the Environment. The course will be repeated in March 1993.

American Bar Association Course. CEQ and DOJ lawyers helped organize a NEPA course sponsored by the American Law Institute of the American Bar Association in Washington, D.C., in November

Federal Leadership Training. During the year, CEQ participated in leadership-training courses for federal agency personnel, including courses sponsored by the Federal Executive Institute and the Office of Personnel Management Executive Seminar Centers.

Agency Implementation

In 1992 agency implementation of NEPA regulations produced the following developments.

Emergency Alternatives. CEQ regulations provide for alternative compliance arrangements in the event of emergency circumstances.

- **Department of Energy.** In July 1991 the Department of Energy (DOE) and CEQ reached an agreement regarding alternative NEPA arrangements for the immediate drawdown of Par Pond at the closed Savannah River nuclear weapons facility. CEQ concurred with DOD that the weakened state of the Par Pond Dam constituted an emergency under CEQ regulations and that drawdown of the pond was necessary to avert a potentially damaging and life-threatening flood in the case of dam failure. Alternative NEPA arrangements included preparation of a special assessment and implementation of specific mitigation measures.

- **Agency for International Development.** When the Mount Pinatubo volcanic eruption in the Philippines was followed by the rainy season, the Agency for International Development (AID) consulted with CEQ regarding EIA procedures for disaster assistance. Consultation with CEQ also took place for the shipment of emergency supplies of fuel and food to the Bosnia area.
- **Department of Defense.** Hurricane Andrew, which devastated south Florida in August 1992, virtually destroyed Homestead Air Force Base. Seeking to relocate some essential missions, the Department of Defense (DOD) sought CEQ assistance in fashioning NEPA compliance for the temporary relocation of activities to other areas. In consultation with CEQ, DOD committed to preparing EAs for each relocation, with public involvement in preparation of documents to the extent practicable. If any EA indicated that significant environmental impacts might occur as a result of relocation, DOD agreed to contact CEQ immediately for additional consultations on appropriate alternative NEPA arrangements.

Agency NEPA Regulations. In 1992 after consultations with CEQ, the Department of Energy, USDA Forest Service, and the Bureau of Land Management published new agency NEPA regulations.

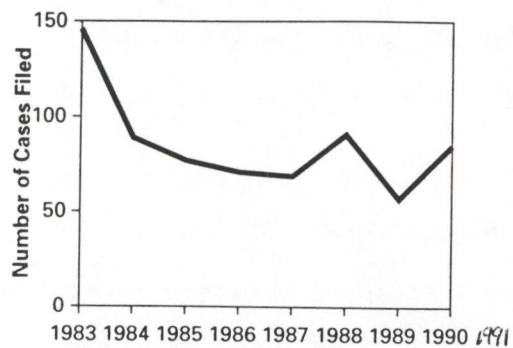
CEQ also consulted with the following agencies in the process of publishing new NEPA regulations or revising existing ones: the Office of Surface Mining, Bureau of Mines, and Bureau of Indian Affairs; the Indian Health Service in the Department of Health and Human Services, and the National Indian Gaming Commission.

Agency Workshops on NEPA Implementation. In addition to regional conferences, CEQ also participated in the following NEPA workshops:

- **Federal Agency Workshops.** CEQ took part in workshops on NEPA implementation issues sponsored by federal agencies, including EPA, DOE, the Department of the Army and Army Corps of Engineers, and the Minerals Management Service, National Park Service, and Fish and Wildlife Service. Conferences on Native Americans and the environment included the First National Tribal Conference on Environmental Management, held in Cherokee, North Carolina, and the annual Bureau of Indian Affairs NEPA workshop.
- **Environmental Impact Assessment Conferences.** CEQ took part in conferences on environmental impact assessments sponsored by EPA Regions III and IV, the Advisory Committee on Intergovernmental Relations, and the American Association of Law Schools Environmental Law Committee.

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NEPA cases filed.



To be updated.

NEPA Case Law

In 1992 NEPA case law included decisions by the United States Supreme Court and by federal courts of appeal and district courts.

Old Growth Timber Sales

Robertson v. Seattle Audubon Society, 112 S.Ct. 1407 (1992)

The case concerned challenges to the policy of the USDA Forest Service and the DOI Bureau of Land Management (BLM) to allow the harvesting and sale of timber from old-growth forests in the Pacific Northwest. The Portland Audubon Society originally brought suit against BLM in 1987, and the Seattle Audubon Society challenged Forest Service decisions in 1989. Congress, attempting to resolve the issues raised in these cases, passed section 318 of the Department of Interior and Related Agencies Appropriations Act for fiscal 1990, which went into effect on October 23, 1989.

While section 318 mandated a specified volume of timber sales, established a timber management plan for national forest and BLM lands in Oregon and Washington, and prohibited sales in identified spotted owl habitat areas, it also declared that management of areas according to subsections (b)(3) and (b)(5) of this section on the 13 national forests in Oregon and Washington and BLM lands in western Oregon known to contain northern spotted owls is adequate consideration for the purpose of meeting the

statutory requirements that are the basis for the consolidated cases captioned Seattle Audubon Society et al. v. F. Dale Robertson, Civil No. 89-160; Washington Contract Loggers Assoc. et al. v. F. Dale Robertson, Civil No. 89-99 (order granting preliminary injunction); and the case Portland Audubon Society et al. v. Manuel Lujan, Jr., Civil No. 87-1160-FR. Pub. L. No. 101-121, 103 Stat. 701, 754-50, § 318(b)(6)(A). Based on section 318, the district court in Seattle Audubon vacated its preliminary injunction, and the district court in Portland Audubon granted the government's motion to dismiss.

On appeal, plaintiffs in the consolidated cases claimed that section 318 violates the separation of powers doctrine and was thus unconstitutional. The Ninth Circuit Court of Appeals agreed, holding that Congress had not repealed or amended the environmental laws underlying the litigation but rather had endeavored to instruct the federal courts to reach a particular result in specified pending cases (Seattle Audubon Society v. Robertson, 914 F.2d 1311 (9th Cir. 1990)).

The United States Supreme Court, however, reversed the court of appeals and concluded that section 318 compelled changes in the law, not findings or results under old law. The citations to specific lawsuits, said the Court, "served only to identify the five 'statutory requirements that are the basis for' those cases...." To the extent that the applicable language affected the adjudication of those cases, it did so by modifying the

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provisions at issue. Further, the Court noted that Congress may amend substantive law in an appropriations statute as long as it does so clearly and found that Congressional intent in section 318 was "not only clear, but express."

Justiciability: Finality and Standing

Foundation on Economic Trends v. Lyng, 943 F.2d 79 (D.C. Cir. 1991)

Plaintiffs sought an injunction and declaratory judgment against the Department of Agriculture (USDA) for failure to prepare an EIS for the USDA "germplasm preservation program." On the merits, the district court granted summary judgment for defendants on the ground that plaintiffs had failed to identify a proposal for which an EIS should have been prepared under NEPA.

Before reaching the merits, the Court of Appeals for the District of Columbia Circuit questioned plaintiffs' standing under the recent Supreme Court decision in Lujan v. National Wildlife Federation, 110 S.Ct. 3177 (1990). First, the court noted that when a party seeks judicial review of agency action under the Administrative Procedure Act (APA), as in this case, plaintiffs must identify the agency action affecting their interests and must demonstrate that the interest sought to be protected is arguably within the zone of interests to be protected by the statute.

Next, the court explained that plaintiffs in the instant

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case claimed informational standing, that is, injury based on the absence of information contained in an EIS. The court concluded, however, that under the Lujan decision, an agency's refusal to prepare an EIS was not a particular agency action that could be the source of injuries sufficient to confer standing. Plaintiffs in NEPA cases must point to an action at least arguably triggering the agency's obligation to prepare an EIS.

Based on this analysis, the court held that the germplasm preservation program for which plaintiffs sought the preparation of an EIS was not an identifiable action or event. "Plaintiffs fail to target their complaint to a particular proposal for federal action and fail to identify any revisions or changes taken by any of the defendants in the germplasm program that would trigger the obligation to prepare an environmental impact statement under NEPA." The court vacated the judgment in the lower court and remanded the case with instructions to dismiss the complaint for lack of jurisdiction.

Public Citizen v. Office the U.S. Trade Representative, No. 92-5010, 1992 (D.C. Cir. Aug. 7, 1992) (available on WESTLAW, CTADC database, WESTLAW No. 186568)

Plaintiffs claimed that the President and the U.S. Trade Representative were required to prepare EISs for negotiation of a North American Free Trade Agreement (NAFTA) and the Uruguay Round of multilateral trade negotiations under the General Agreement on

Tariffs and Trade. The district court dismissed the suit on the ground that plaintiffs lacked standing to pursue their claims, and it also noted ripeness problems.

The Court of Appeals for the District of Columbia Circuit concluded that plaintiffs had failed to identify a final agency action within the meaning of the Administrative Procedure Act (APA). The basis for judicial review of NEPA claims is final agency action under the APA. In the absence of a final agreement in either the NAFTA or Uruguay Round negotiations, and the possibility that no final agreements would result, the court concluded that no final agency action under the APA existed, and the district court therefore did not have jurisdiction. The Court of Appeals, accordingly, affirmed the dismissal.

Following the President's announcement of a NAFTA agreement on September 12, 1992, Public Citizens filed a new action to compel preparation of an EIS only with respect to the NAFTA, Public Citizens v. USTR, No. 92-2102 (filed September 15, 1992). Public Citizens filed a motion for summary judgment on October 15, 1992.

Idaho Conservation League v. Mumma, 956 F.2d 1508 (9th Cir. 1992)

Plaintiffs challenged a Forest Service decision not to recommend wilderness designation for 43 of 47 roadless areas within the Idaho Panhandle Forest, claiming that the decision violated both the National Forest Management Act and NEPA. The

district court granted summary judgment for the defendants, finding that plaintiffs lacked standing to sue, that the claims were not ripe, and that the Forest Service had adequately complied with all relevant requirements.

The Court of Appeals for the Ninth Circuit first determined that plaintiffs had met the tests required to show standing to pursue their claim. Plaintiffs' injury, the court stated, was the agency's alleged procedural failure to prepare an adequate EIS, which created a risk that environmental impacts would be overlooked in the decisionmaking process. While the lower court concluded that plaintiffs lacked standing because the alleged threat of injury was several procedural steps away (that is, the agency would still have to go through another layer of decisionmaking and NEPA compliance before approving actual development in the geographical areas of interest), the appeals court found that the initial plan and wilderness recommendation are important decisions that could result in the type of concrete injury that plaintiffs had standing to challenge:

More importantly perhaps, if the agency action only could be challenged at the site-specific development stage, the underlying programmatic authorization would forever escape review. To the extent that the plan predetermines the future, it represents a concrete injury that plaintiffs must, at some point, have standing to challenge. That point is now, or it is never.

In discussing the plaintiffs' obligation to show a personal, as opposed to a diffuse, collective stake in the claim, the court

distinguished the case at bar from the facts in Lujan vs. National Wildlife Federation, 110 S.Ct. 3177 (1990). In Lujan, plaintiffs had alleged that they used locations "in the vicinity" of lands that would be open to mining, while in this case plaintiffs pointed to members who used particular areas potentially open to development.

The appellate court also found that plaintiffs' alleged injury was fairly traceable and likely to be redressed by the remedy sought. Despite the future involvement of Congress and third parties in a scenario of development, the court pointed out that third parties could not undertake future actions "but for" the challenged decision. "The non-wilderness recommendation is thus the primary factor making possible subsequent development."

Similarly, the court found that the action was ripe for review. Unlike the situation in the Lujan case, plaintiffs were not challenging a "general program of land review" but rather the implementation of a program in a particular instance.

Having found that plaintiffs had standing and that the case was ripe for review, the court proceeded to discuss the merits of plaintiffs' claim that the range of alternatives in the EIS was inadequate. The court concluded that the Forest Service did adequately consider alternatives, including one proposed by the plaintiffs. The court found that the Forest Service properly identified parameters and criteria related to Plan standards for generating alternatives for serious consideration. The court

noted that use of the criteria, which plaintiffs did not challenge, was reasonable and that, without such criteria, "an agency might engage in the empty exercise of generating and 'considering' countless alternatives, even alternatives known to be unacceptable at the outset." Thus, the court affirmed the lower court's dismissal of the complaint on the merits.

Natural Resources Defense Council v. Lujan, 768 F.Supp. 870
(D.D.C. 1991)

National and local Alaskan environmental organizations challenged a legislative EIS (LEIS) prepared by defendants in 1987, concerning the future management of the Arctic National Wildlife Refuge (ANWR) and subsequently filed a motion for a preliminary injunction to compel defendants to circulate as a draft supplemental LEIS a report issued by defendants in 1991. In a motion to dismiss, defendants argued, among other things, that plaintiffs lacked standing under NEPA, that the NEPA claims plaintiffs sought to raise were not justiciable under the separation of powers doctrine, and that a statutory conflict between the Alaska National Interest Lands Conservation Act (ANILCA) and NEPA prevented defendants from revising the 1987 LEIS. The court held that plaintiffs had standing to challenge the adequacy of the LEIS under NEPA and issued a declaratory judgment that defendants had violated NEPA by not issuing the 1991 report as a supplemental LEIS.

Before reaching the standing issue, the court noted that earlier litigation between the same parties on procedural aspects of the issuance of the 1987 LEIS had resulted in a determination that the LEIS did not fall within the modified procedures for legislative proposals found in the CEQ regulations. Those regulations exempt legislative EISs from the requirement that an EIS be prepared in two stages, permitting an agency to transmit a single LEIS to Congress, other agencies, and the public for review and comment. This modified procedure is not available, however, where "[t]he proposal results from a study process required by statute." The ruling in the earlier case, according to the court, had consequences in the instant case because it meant that the 1987 LEIS was subject to the same requirements as any EIS.

With respect to standing, plaintiffs alleged that the failure of the 1987 LEIS to comply with NEPA, ANILCA, and the APA made the LEIS so inadequate that Congress would not have the full information it needed to make a decision on the future use of ANWR; if an uninformed Congress acted to allow oil exploration in ANWR, it would adversely affect plaintiffs who use and enjoy the area. In addition, plaintiffs alleged that the deficiencies in the 1987 LEIS adversely affected their public participation rights because the data and analyses in it were flawed.

The court found plaintiffs to have alleged that the inadequacies of the 1987 LEIS created "a risk that serious

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environmental impacts will be overlooked" and concluded that this sufficed to establish injury in fact. Since plaintiffs had alleged that they used and enjoyed the area, they had met both the requirement of geographical nexus and the requirement that their interests be within the NEPA zone of interests:

There is no doubt that "recreational use and aesthetic enjoyment" are among the sorts of interests that NEPA was specifically meant to protect.

Plaintiffs' participatory rights were also found to be within the zone of interests protected by NEPA:

If a decision subject to NEPA...is made without the information that NEPA seeks to put before the decisionmaker, the harm that NEPA seeks to prevent occurs.

On the separation of powers argument, the court ruled that the exercise by Congress of its legislative powers would not nullify any declaratory relief the court might grant. A legislative EIS is not simply a legislative aid but rather serves in part to ensure that the public has an opportunity to participate meaningfully in decisionmaking at the administrative and legislative levels. Accordingly, the court held that the requirement of an adequate EIS for legislative proposals can be enforced by a private right of action.

The court also rejected defendants' argument that ANILCA overrides or repeals NEPA, thus precluding the revision or supplementation of the 1987 LEIS. ANILCA by its terms does not

repeal NEPA, and repeal by implication is disfavored. In the context of NEPA, which requires federal agencies to comply with its mandate to "the fullest extent possible," courts have been especially reluctant to hold that another statute overrules it.

As to the merits of plaintiffs' claim regarding whether the 1991 report should be circulated as a supplement to the 1987 LEIS, the court first reiterated the finding of the earlier litigation that the 1987 LEIS fell into the exception to the exemption in the CEQ regulations for legislative EISs.

Addressing defendants' argument based on the conclusion that a legislative EIS must be prepared in two stages did not mean that it must also be supplemented, the court then noted that "[a]n agency's duty under NEPA is a continuing one." So long as the decisionmaking process is still pending, the dissemination of relevant environmental information will be promoted by supplementation.

Having determined that the 1987 LEIS was subject to supplementation, the court found that the information contained in the 1991 report was "significant" as that term is defined in the CEQ regulations, although it was not environmental information and no change occurred in assessed impacts on the environment. Citing earlier NEPA cases, the court held that supplementation is required where new information so alters a project's character that a new "hard look" at the environmental consequences is necessary, even where the change is not strictly

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environmental. The court noted that defendants considered the new information in the 1991 report to be important inasmuch as it included new geologic as well as economic data and supported the 1987 LEIS recommendation of full oil leasing in ANWR's coastal plain. Because the information contained in the 1991 report was significant, the court held that defendants' failure to issue and circulate that report as a supplemental LEIS was a violation of NEPA. The United States has filed a notice of appeal.

Decision to Prepare an EIS

Roanoke River Basin Association v. Hudson, 940 F.2d 58 (4th Cir. 1991), cert. denied, 112 S.Ct. 1164 (1992)

The Army Corps of Engineers issued a permit to the City of Virginia Beach to construct a water-intake structure and pipeline to divert water from Lake Gaston--part of the Roanoke River system--to Virginia Beach's water supply. Prior to issuing the permit, the Corps prepared an environmental assessment on this proposal and concluded that, with mitigation, the environmental impacts would not be significant and the preparation of an EIS was not required. Plaintiffs challenged the Army Corps decision not to prepare an EIS in light of the possible impact that the pipeline might have on the striped bass population of the Roanoke River.

Affirming a lower court's finding in favor of the Army Corps, the Court of Appeals for the Fourth Circuit held that if a

mitigation condition eliminates all significant environmental effects, no EIS is required. The only significant impact alleged was the impact on striped bass, and the Army Corps' determination that a mitigation condition would eliminate any adverse impact was supported by the record. The court also noted that the existence of a disagreement between the Army Corps and other federal agencies as to the need for an EIS is not by itself grounds for a court to require an EIS.

Supplementing an EIS

Coker v. Skidmore, 941 F.2d 1306 (5th Cir. 1991)

In this decision, the Court of Appeals for the Fifth Circuit overturned the district court's determination that a supplemental EIS had to be prepared prior to construction of a 5.4-mile levee on the Yazoo River in Mississippi. The levee construction was part of the Yazoo River Basin Flood Control Project, for which the Corps of Engineers prepared a programmatic EIS in 1975. The District Court found that the 1975 EIS was outdated and thus had to be supplemented before the levee construction could proceed.

The court of appeals overturned the district court's ruling, because the lower court had not evaluated the case using the CEQ and Corps NEPA standards for supplementation. The CEQ regulations (40 CFR § 1502.9(c)) state that an agency must supplement an EIS if the agency makes substantial changes in the proposed action relevant to environmental concerns, or if

significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts arise. The district court explicitly found no evidence that construction of the levee would have a significant environmental effect. The court noted that an EIS need not be supplemented "whenever new information concerning a project comes to light...or when portions of it become out of date."

Functional Equivalent Doctrine

Western Nebraska Resources Council v. EPA, 943 F.2d 867 (8th Cir. 1991)

In relevant part, the Court of Appeals for the Eighth Circuit found that EPA need not comply with NEPA prior to its actions under the Safe Drinking Water Act (SDWA). Following a long line of cases dealing with EPA administration of pollution control laws, the court found that the SDWA is the "functional equivalent" of the NEPA process and thus, adherence to NEPA formal requirements is not necessary.

Environmental Assessments

Sierra Club v. James D. Watkins, No. 88-3519 (34 E.R.C. 2057, D.D.C. Dec. 9, 1991; available on LEXIS, Genfed library, Dist file, LEXIS No. 17482)

This case dealt with NEPA compliance for the importation of spent nuclear fuel rods from Taiwan to the United States. The

court found the EA prepared by DOE to be inadequate, despite finding that plaintiffs had failed to demonstrate that the proposed action would have a significant environmental impact. The court upheld the DOE FONSI for the project.

The court premised what it acknowledged to be an unusual opinion on a discussion of the purpose and function of EAs. While acknowledging that one function is to determine whether the proposed action will have significant environmental impacts and thus require preparation of an EIS, the court relied on that portion of the CEQ regulation which states that an EA serves to aid an agency's compliance with NEPA, where no EIS is necessary (40 CFR §1508.9(a)(2)). The court found further support for its determination that EAs have an independent function in section 102(2)(E) of NEPA, which requires agencies to "study, develop and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."

The court noted that the examination of alternatives was bounded by the "rule of reason" and that the level of analysis should be concomitant with the severity of the impacts. In this instance, however, the court found both the agency's choice of alternatives and analysis of cumulative risks of radiation exposure to be inadequate. The court also ruled that DOE should have considered risks associated with a worst case scenario, without discussing the 1986 amendment to the CEQ regulations

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related to that issue.

Natural Resources Defense Council v. Duvall, 777 F.Supp. 1533
(E.D.Cal. 1991)

In this case, the district court found that the Bureau of Reclamation FONSI for proposed regulations to implement provisions of the Reclamation Reform Act could not be sustained. The court first discussed the differences it perceived between the standards for review of the adequacy of an EIS and review of a FONSI determination. It decided not to follow the United States Supreme Court choice of the arbitrary and capricious standard in Marsh v. Oregon Natural Resources Council, 490 U.S. 360 (1989), which concerned a decision to prepare a supplemental EIS. Rather, in reviewing the Bureau decision not to prepare an EIS ab initio, the court chose to follow what it perceived as the less deferential "reasonableness" standard.

The court found the FONSI to be insufficient in several respects. First, the court, finding no applicable reference in CEQ regulations or guidance, saw "no apparent reason" to believe that incorporating information by reference is appropriate in the context of an EA. The court noted that even if incorporation by reference was permissible in an EA, the requirements set forth in the applicable CEQ regulation (40 CFR § 1502.21) were not adhered to in this instance.

Second, the court disputed economic assumptions made in the

EA, as well as the reasonableness of the EA conclusions. The court also faulted the analysis for focusing primarily on California case studies, although the regulations would apply in other western states. Finally, the court found that in light of explicit language in the Reform Reclamation Act requiring the Secretary of the Interior to consider water measures, the EA improperly omitted consideration of an alternative regulatory program that focused on water conservation measures. The United States has appealed the decision to the Ninth Circuit.

POLLUTION PREVENTION

Also see Federal Facilities Management, Hazardous and Solid Wastes, Private Sector Initiatives, and related tables and figures in Part II.

It is the national policy of the United States that pollution should be prevented or reduced at the source. The Pollution Prevention Act of 1990 gives the force of law to the common sense notion that very often, the best, most economically efficient way of reducing the impact of society's waste on the environment is to make less of that waste in the first place. Pollution prevention means changing the way the nation produces and consumes goods and services so that fewer pollutants are generated, and as a result, fewer pollutants are released into the environment.

Conditions and Trends

Federal initiatives, including the Pollution Prevention Act, have contributed to recent increases nationwide acceptance of the principles of pollution prevention.

State Legislation

In addition to federal legislation, 27 states now have pollution prevention laws in place. Most of these laws, enacted since 1987, target hazardous and solid wastes, and one state, Iowa, includes air emissions. Many follow the example of the

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federal Pollution Prevention Act and include a waste management hierarchy with the preferred option--pollution prevention or source reduction--at the top, followed next by environmentally sound recycling and finally by waste treatment and disposal. Some of the laws extend technical and financial assistance to waste generators to speed pollution prevention efforts, and others require waste generators to formulate facility-wide pollution prevention plans. Such plans help the generators analyze their waste streams and identify opportunities for pollution prevention.

Toxic Release Inventory

Between 1989 and 1990, releases and transfers of toxic chemicals measured by the Toxic Release Inventory, maintained by the Environmental Protection Agency (EPA), showed a decrease of 600 million pounds or 11 percent to 4.8 billions pounds. Releases into the air totaled 2.2 billion pounds, a 14-percent decrease from the 1989 level of 2.5 billion pounds. Releases to land decreased from 454 million pounds in 1989 to 440 million pounds in 1990. Releases into lakes, rivers, and other bodies of water increased by 2 percent, or 4 million pounds.

Municipal Solid Waste

Americans generated 4.3 pounds of municipal solid waste per person per day in 1990, an 8-percent increase over the 1988

level. EPA estimates that the amount of waste generated will increase through the end of the decade but at a slower rate, reaching 4.5 pounds per person per day by the year 2000. Efforts to promote source reduction, production of more durable products, and backyard composting could help to further slow or even reverse this trend.

Policies and Programs

The federal government promotes pollution prevention through regulatory and enforcement actions, cooperation with state and local governments and private-sector groups, pollution prevention grants, and encouragement of voluntary, private efforts.

Regulation and Enforcement

Federal agencies, such as the Council on Environmental Quality (CEQ), EPA, and the Federal Trade Commission (FTC) are shaping regulatory and enforcement actions to promote pollution prevention.

National Environmental Policy Act. NEPA includes among its objectives promotion of efforts to prevent or eliminate damage to the environment. Accordingly, CEQ provides guidance to federal agencies on incorporating pollution prevention into the design and execution of projects. Federal pollution prevention efforts, where appropriate, are a part of Environmental Impact Statements (EIS) and Environmental Assessments (EA). Whether federal

agencies manage public lands, issue regulations, or purchase office supplies, the CEQ guidance helps ensure that federal actions and federal funds serve as a catalyst for national efforts to reduce pollution at its source.

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Guidelines for Environmental Marketing

Consumers can help prevent pollution by considering the environmental impacts of the products they purchase. In July 1992 the Federal Trade Commission, with input from EPA, issued the following national guidelines to address application of section 5 of the Federal Trade Commission Act to environmental advertising and marketing practices:

- Environmental claims must be substantiated by reliable scientific evidence;
- Qualifications and disclosures should be sufficiently clear and prominent on a product to prevent deception;
- Environmental claims should make clear whether they apply to the product, the package, or a component of either;
- Environmental claims should not overstate the environmental attribute or benefit;
- A claim comparing the environmental attributes of one product with those of another should make the bases for the comparison clear and should be substantiated.

The guidelines cover the following environmental claims being made by advertisers for products in the U.S. marketplace:

General environmental benefit. Unless substantiated, claims of general benefit, such as "environmentally friendly" or "environmentally safe," should be avoided.

Degradable, Biodegradable, and Photodegradable. Claims should be substantiated by evidence that the product will completely decompose into elements found in nature within a reasonable time after consumers dispose of it in the customary way.

Compostable. Claims should be substantiated by evidence that all materials in the product or package

will break down into usable compost, such as soil-conditioning material and mulch, in an appropriate composting program or facility or in a home compost pile or device.

Recyclable. A product or package should not be marketed as recyclable unless it can be collected, separated, or recovered from the solid waste stream for use in the form of raw materials in the manufacture of a new product or package.

Recycled Content. Materials should have been recovered or diverted from the solid waste stream, either during manufacture or after consumer use.

Source Reduction. Claims that a product or package has been reduced or is lower in weight, volume, or toxicity should be qualified to avoid deception about the amount of reduction and the basis for any comparison asserted.

Refillable. Claims should provide for collection and return of the package for refill or for later refill of the package by consumers with a product subsequently sold in another package.

Ozone Safe and Ozone Friendly. A product should not be advertised as ozone safe, ozone friendly, or as not containing CFCs, if the product contains any ozone-depleting chemical.

While the guidelines themselves do not have the force of law, failure on the part of companies to follow them can result in the Federal Trade Commission bringing suit against offending companies. Between July 1991 and July 1992, FTC announced consent agreements in eight such enforcement actions. In three cases, products containing CFCs or other ozone-depleting chemicals claimed to be ozone-friendly. Four cases involved unsubstantiated claims of biodegradability of plastic trash bags and disposable diapers. The eighth case dealt with a manufacturer's improper claim that its product was pesticide-free. The settlements in these cases prevent the companies from using misleading claims in the future.

The Commission is seeking public comments on whether to modify the guidelines at the end of a 3-year period. In the meantime, interested parties may petition FTC to amend the guidelines.

Supplemental Environmental Projects. EPA encourages pollution prevention through the inclusion of Supplemental

Environmental Projects (SEPs) in settlement agreements resolving violations of environmental statutes. As part of such an agreement, a defendant conducts pollution prevention or other projects that reduce risks to human health and the environment, beyond what is required by law. To date, EPA has negotiated 164 SEPs in settlements under the Emergency Planning and Community Right-to-Know Act, Resource Conservation and Recovery Act (RCRA), Clean Water Act (CWA), Clean Air Act (CAA), and Toxic Substances Control Act (TSCA). Facilities generally commit to spending \$1-5 for every penalty dollar reduced as part of the settlement. Annual reductions in toxic chemicals used or released by defendants have ranged from 8,500 pounds to 1.5 million pounds per project. The goal of this EPA program is to encourage SEPs that eliminate or significantly reduce pollutants or decrease natural resources usage, while showing little or no increase in net costs to the offending facility.

Source Reduction Review. The Pollution Prevention Act requires EPA to review its own regulations to determine their potential for source reduction. EPA established the Source Reduction Review Program (SERP) to ensure early review of key regulations mandated by CAA, CWA, and RCRA. In developing industrial standards, EPA is considering the use of source reduction technologies, along with command-and-control options, as the basis for regulatory standards.

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Government-Business Cooperation

The federal government cooperates with private businesses on pollution prevention through a number of initiatives.

President's Commission on Environmental Quality. In cooperation with the President's commission (PCEQ), 11 major corporations have undertaken voluntary demonstration projects at 12 facilities to test the integration of total quality management (TQM) and pollution prevention. Using quality improvement methods to eliminate inefficiencies that waste resources and cause pollution, the project seeks to cut emissions at targeted facilities and save money at the same time. PCEQ is preparing a report, "Total Quality Management: A Blueprint for Pollution Prevention," to present quality environmental management (QEM) incentives and barriers, management processes, and measures of success to guide the development of new QEM programs.

Integrated Resource Planning. Under the President's National Energy Strategy, the Department of Energy (DOE) supports Integrated Resource Planning (IRP) by state and federal agencies as well as by individual utility companies. Expanding the traditional electric power planning process that typically considers only utility-generated energy options for meeting electricity demand, IRP adds conservation, load management, and independent power purchases. By considering alternative sources of energy services, utility companies and utility regulators can avoid the pollution that would result from only building more

powerplants and generating more electricity. By the year 2000 DOE estimates that 40 states will have implemented IRP programs, and planning decisions for 90 percent of the nation's generating capacity will be made with pollution prevention in mind.

Green Lights. EPA sponsors this voluntary program to encourage corporations and state and local governments to install energy-efficient lighting in their facilities. Participants reduce energy consumption by replacing existing lighting with technology that delivers the same or better quality lighting while saving electricity, preventing pollution, and saving money on electricity bills. By October 1992 a total of 651 facilities had committed 2.9 billion square feet of office space to the program--more office space than exists in New York City, Los Angeles, Chicago, Houston, Dallas, San Francisco, and Washington D.C., combined. Once enrolled, participants survey their facilities to see where lighting efficiency can be improved and commit to making 90 percent of the identified cost-effective lighting upgrades within five years. In 1992 Green Lights resulted in an average reduction in lighting electricity demand of 53 percent, total energy savings of 100.5 million kilowatt hours, and a \$6.8 million reduction in energy bills. These upgrades achieved annual emission reductions of 133.5 million pounds of carbon dioxide, 1.2 million pounds of sulfur dioxide, and 482,000 pounds of nitrogen oxides. When fully implemented, the project has the potential to prevent several thousand times

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these quantities of air emissions. Green Lights maintains a Hotline number, (202) 775-6650, to provide information on the program.

Energy Star. A major obstacle to marketing energy-efficient equipment is the lack of reliable information on whether the equipment will perform as promised. A new EPA product-labeling program identifies proven energy-efficient products with a distinctive "Energy Star" logo. Consumers will find the Energy Star seal of approval on commercial and residential products such as computers, showerheads, and room air conditioners beginning in the summer of 1993. [LOGO ART]

Golden Carrot. EPA and a consortium of electric utility companies are working on an initiative called the Golden Carrot to overcome another barrier to developing the energy efficiency market--the time lag between development and commercialization of energy-efficient products. Participating utilities have established a \$30 million prize for the first company to market a non-CFC refrigerator that is at least 25 percent more energy efficient than 1993 standards. By the year 2000 such refrigerators could reduce electricity consumption by 3 billion kilowatt hours per year, saving consumers \$240 million on their annual electric bills. The Golden Carrot competition could help the nation implement the Framework Convention on Climate Change by preventing 600,000 metric tons of carbon emissions each year.

It also could help meet U.S. obligations under the Montreal Protocol to phase out CFC production.

Future Golden Carrots could bring to the market high efficiency clothes washers and dryers, water and space heaters, and central air conditioning systems. Golden Carrot also is inspiring other nations to promote energy efficiency. In Thailand, public utilities have developed a "Golden Mango" program to bring high-efficiency refrigerators to its market.

NICE3. Short for "National Industrial Competitiveness through Efficiency: Energy, Environment, and Economics," NICE3 is a state grant program jointly administered by EPA, and the departments of Commerce and Energy. Grants support innovative technologies in waste reduction and energy efficiency that can improve industrial competitiveness. In 1991 the following grants helped save energy, reduce hazardous wastes, and generate cost savings.

- **Methanol Recovery.** A grant helped the Peroxygen Chemical Division of FMC Corporation in Texas develop a method to use steam distillation to recover spent methanol from its hydrogen peroxide purification process, thus reducing the facility's energy consumption by 300 billion BTU, its hazardous waste generation by 14.6 million pounds, and its operating costs by \$11.9 million per year.

- **Reclaimed Cleaning Water.** A grant helped a PPG Industries facility in Ohio design and install a combined ultrafiltration/reverse osmosis unit to reclaim cleaning water used in the production of water-based primers. The unit will save the company \$205,000 per year while reducing hazardous wastes by 3.1 million pounds and cutting energy consumption by 190 billion BTU.
- **Reduced Emissions of Volatile Organic Compounds.** A grant to the Niagara Mohawk Power Corporation and Carrier Corporation in New York helped demonstrate how reducing the emission of volatile organic compounds can lead to energy efficiency improvements. If adopted nationwide, the program has the potential to save 30 trillion BTU and avoid the generation of 126 million pounds of hazardous waste each year.

33/50 Program. The EPA 33/50 program derives its name from its goals--a reduction of 33 percent by 1992 and of 50 percent by 1995 in environmental releases and off-site transfers of 17 priority pollutants. The baseline year for reductions is 1988, when releases and transfers of these chemicals totaled 1.4 billion pounds, as measured by the Toxic Release Inventory (TRI). By October 1992, a total of 937 companies had volunteered to reduce their releases and transfers by 347 million pounds.

[BAR CHART AND LIST OF CHEMICALS]

National Science Foundation Research Grants. In 1992 NSF and the Council for Chemical Research, Inc., initiated a program to fund research aimed at reducing manufacturing pollution at its source by designing new chemical synthesis and processing methods. In 1992 the program funded ten joint university-industry research programs and anticipates rapid expansion in 1993. Research projects seek feedstock substitutions, alternative synthetic and separation procedures, better catalysts, and process modifications to reduce resource and energy consumption and minimize the production of byproducts and wastes. Industrial participation in the design and evaluation of the projects ensures the applicability of research to real-world manufacturing problems and speeds technology transfer from the laboratory to the manufacturing plant.

Dye Industry Initiative. EPA and the Ecological and Toxicological Association of Dyestuffs Manufacturers (ETAD) have developed a pollution prevention program for the dye industry. In October 1991 a task force, with representatives from ETAD, individual companies, and EPA, issued a pollution prevention manual for the dye industry. The manual identifies opportunities for pollution prevention and recycling for all operations related to dye manufacturing, from purchasing materials to packaging the product. To monitor progress, ETAD is using a survey that

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collects information on waste reduction activities in the industry.

Design for the Environment. In 1992 EPA launched DFE to apply pollution prevention principles to the design of chemical processes and products. By disseminating information on the comparative risk and performance of chemicals, DFE helps industries make informed, environmentally responsible design choices. The program includes the following components:

- **Chemical Design Grants Program.** DFE is funding research at six universities to minimize or eliminate toxic substances in the synthesis of chemicals.
- **National Center for Pollution Prevention.** This consortium, located at the University of Michigan, is developing academic curricula on chemical design for use in business, engineering, and natural resources programs.
- **Demonstration Projects.** In the Printing Industry Pilot Project, EPA is bringing together printers, printing trade associations, and chemical and equipment suppliers to investigate alternative chemicals and processes to prevent pollution.
- **Insurance Incentive.** This pilot project is designed to work with the insurance industry to investigate whether rates can be adjusted to reflect the reductions in environmental liability associated with pollution prevention projects.

- **Full Cost Accounting.** As part of the program, EPA is preparing a workshop on how companies can account more accurately for the costs of their polluting activities.

Recycled Products Trade Fair. In June 1992 the Council on Federal Recycling and Procurement Policy hosted a trade fair to increase the use of recycled-content products by the federal government. The theme, "Closing the Loop," stressed that unless materials recovered from the waste stream are turned into products that someone can use, they have not really been recycled. The fair brought together the makers of recycled-content products with one of the country's largest consumers--the federal government. Recycled content product manufacturers demonstrated the availability and quality of their products, while government officials explained the process of selling those products to the government.

Department of Defense Purchasing. As major purchasers and users of hazardous materials, the armed services have the potential to reduce pollution in their operations. In 1992 the Army, Air Force, Navy, and Marines recorded pollution prevention accomplishments in the following areas of operations:

- Systems acquisition,
- Material substitution,
- Process improvement, and
- Improved material management.

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For more information, see the Department of Defense section.

Voluntary Initiatives

Through awards programs, the federal government recognizes outstanding voluntary initiatives to prevent pollution.

EPA Pollution Prevention Awards. In May 1992 the EPA Administrator's Awards recognized 17 organizations for outstanding achievements in pollution prevention. Winners were selected from 840 applicants, and awards were made in six organizational categories: environmental, nonprofit, and community organization; small and large business; local governments; state government; federal government; and educational institution. Recipients included the following:

- A Chemical Hazards Prevention Program by Inform, Inc.;
- Green Star Program by the Alaska Center for the Environment;
- A Volatile Organic Compound Reduction Program by Mead Packaging;
- A new single-coat paint developed by the Navy; and
- A pollution prevention planning model developed by the Air Force.

[EPA PHOTO OF UNICOAT AWARD]

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PRIVATE SECTOR INITIATIVES

Also see Education, Pollution Prevention, Technology, and related tables and figures in Part II.

A growing number of private-sector organizations, including for-profit and non-profit groups, recognize the synergy between environmental protection and economic growth. In 1992 this ongoing shift in American culture was evident in new and expanded environmental initiatives.

Conditions and Trends

American businesses are finding that a strong commitment to environmental protection makes good business sense. The Business Council for Sustainable Development--a group of leaders from 48 major international corporations--concluded in its 1992 report, Changing Course, that environmental concerns are not just a cost of doing business but potentially a source of competitive advantage. In 1992 many U.S. companies implemented large-scale programs and experiments, formed advisory groups, and revised their strategic plans in recognition of the fact that environmental protection can be good for the bottom line.

Environmental initiatives can benefit businesses in the following ways:

- o **Cost Savings.** Companies can prevent pollution and save money by improving efficiency, conserving costly materials, and reducing pollution control costs.
- o **Greater Flexibility.** Proactive environmental initiatives allow companies to define problems, set priorities, and undertake solutions. Voluntary initiatives allow companies to reduce future liability risks and influence the development of more practical, efficient, and effective regulations.
- o **Competitive Advantage.** Companies are finding that environmental leadership keeps them ahead of firms that merely respond to or comply with current regulations.
- o **New Markets.** Environmentally sound products, services, and technologies are spurring consumer demand and commercial opportunities. According to various official estimates, the global market for environmental goods and services is in the range of \$200-300 billion per year and rising by 5-10 percent per year, with a growing proportion available to U.S. exporters.
- o **Increased Performance.** Corporate environmental leadership promotes investor confidence, attracts high-caliber employees, reinforces employee commitment, and improves public image and dialogue.

Non-profit groups can also benefit from the trend by gaining access to decision-makers, helping businesses set priorities, and earning credibility for their technical expertise.

Environmental Partnerships

Many of the benefits to business described above are being achieved through strategic partnerships between businesses and environmental groups who traditionally viewed each other as antagonists. Partnerships are a growing trend for several reasons. While the environmental regulatory process does serve a needed function, power relationships influence the outcome and general social costs can be secondary to the competing interests of each side. In environmental partnerships, interest-based negotiations occur among individuals on the basis of what's best for the community, and solutions must provide benefits to all participants. The resulting environmental solutions are often more effective, efficient, and equitable than policies established through the regulatory tug-of-war.

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Economic Benefits of Corporate Environmentalism

Many companies are seeing significant results from their environmental initiatives. Here is just a small sampling of the many examples possible.

Recycling CFCs. Film Tec, a subsidiary of the Dow Chemical Company, installed new equipment to recover unused chlorofluorocarbons (CFCs), collect CFC vapors, and process CFCs for reuse. The firm has reduced CFC

emissions 87 percent since 1986, production of recovery equipment has tripled, and Dow has saved \$1.6 million.

Reducing Waste. In 1988 and 1989 the Louisiana Division of the Dow Chemical Company invested \$12 million in 47 waste reduction projects. The company estimates that this investment paid for itself in ten months.

Recycling Waste. In Kansas City, the AT&T Waste Watchers program generated new revenues of \$7,120 annually and reduced its expenses by \$75,000 by reusing and recycling 77 percent of its waste.

Eliminating Emissions. The AT&T Columbus, Ohio, plant saved \$210,000 by implementing processes changes that eliminated emissions of perchloroethylene.

Reducing Toxics. Chevron saved \$10 million in disposal costs and reduced hazardous waste 60 percent in the first three years of its Save Money and Reduce Toxics (SMART) program.

Recycling Toxics. In 1990 a volunteer Waste Watchers group at Chevron saved \$94,000 by recycling a toluene-based solvent.

Cutting Disposal Costs. The Ford Assembly Plant in Lorain, Ohio, cut its paint sludge volume by 30 percent and its annual disposal costs by \$56,000 in one year.

Reusing Wastes. The International Paper Company expects to save \$100 million in disposal expenses between 1988 and 1995 by recycling and reusing manufacturing wastes that include boiler ash and chemicals.

Reducing Emissions. Employee-designed improvements at the International Paper Riverdale mill in Alabama reduce water-borne emissions of spent chemicals, saving \$200,000 annually.

Preventing Pollution. The 3M Pollution Prevention Pays program has resulted in cumulative worldwide savings from 1975 to 1990 of \$537 million (\$450 million from U.S. operations).

Controlling Temperature. In White City, Oregon, 3M purchased a start-up computer temperature control system for a paper coating and drying process. The company invested \$16,000 and saved \$533,200 by preventing 137 tons of solid waste and 53 tons of air pollution annually.

Using Chemical Wastes. A Monsanto plant in Texas found a use for chemical wastes that increased production by 20 percent and reduced 5 million pounds of discharge.

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Evaluating Private-Sector Initiatives

In 1992 three organizations took a comprehensive look at the value of proactive, private-sector environmental initiatives. They were:

- Business Council for Sustainable Development, Stephan Schmidheiny, chairman, Changing Course: A Global Business Perspective on Development and Environment, (Boston: The MIT Press, 1992).
 - Bruce Smart, ed., Beyond Compliance: A New Industry View of the Environment, (Washington, DC: World Resources Institute, 1992).
 - Jan-Olaf Willums and Ulrich Golüke, From Ideas to Action: Business and Sustainable Development, (Lysaker, Norway: International Environmental Bureau of the International Chamber of Commerce, 1992).
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Policies and Programs

Agencies throughout the federal government are working to encourage voluntary private-sector initiatives to protect the environment. Some of these programs, such as the Green Lights initiative of the Environmental Protection Agency and the Take Pride in America program of the Department of the Interior, are described in other chapters of this report.

In 1992 the Council on Environmental Quality continued its activity in this field by coordinating two major initiatives: the President's Commission on Environmental Quality (PCEQ) and the President's Environment and Conservation Challenge Awards.

**CEQ ANNUAL REPORT REVIEW DRAFT 11/20/92 DO NOT CITE OR DISTRIBUTE
President's Commission on Environmental Quality (PCEQ)**

Created in 1991 by President Bush, PCEQ provides a new model for environmental action built on voluntary participation, collaboration between different sectors of society, and a commitment to continuous improvement in environmental performance. The Commission consists of 23 members from a cross-section of business and non-profit organizations, each known for his or her vision and previous accomplishments in environmental affairs.

Unlike many traditional presidential commissions which have been convened to study problems and recommend actions by government, PCEQ is oriented toward private-sector action and leadership by example. Over the last 18 months, PCEQ has built a network of over 200 organizations who are participating in demonstration projects, testing new ideas and sharing information and expertise. The Commission is preparing a number of reports to the President and the nation which describe PCEQ's work. The reports provide a blueprint for additional private sector initiatives and call for changes in government policy to foster and encourage such actions.

In 1992 PCEQ sponsored twelve initiatives across the range of environmental issue areas. The initiatives are described here in alphabetical order:

Biological Diversity on Private Lands. This project demonstrates the feasibility of systemically integrating

biodiversity conservation techniques into private land management. In consultation with biodiversity experts, several large commercial landowners have undertaken demonstration projects involving more than 60 sites representing a variety of landscapes and locations throughout the United States. The project team will publish information materials in 1993.

Business/NGO/Government Forum. Participants in PCEQ initiatives are demonstrating that leaders with diverse perspectives can collaborate on important environmental problems. To continue the success of this approach, PCEQ is considering recommending the establishment of a national forum to promote regular collaboration on environment and development issues among businesses, non-governmental organizations (NGOs), and government agencies.

Energy Efficiency. Increased efficiency in the use of electricity and fuel can improve air quality, save money, reduce emissions of greenhouse gases, conserve resources, and strengthen the national economy. PCEQ is encouraging greater energy efficiency on a national scale through a market-based approach. To date, PCEQ's energy team has published a national directory of utility demand-side management programs and enlisted more than 30 companies in making voluntary, cost-effective investments in energy efficiency and taking other steps to trim energy use.

International Environmental Survey. To promote more effective efforts toward environmentally sustainable development

worldwide, PCEQ conducted an international survey of NGOs in 25 countries. The results will be compared to those of a previous survey of businesses around the world to clarify the concerns and agendas of each group.

Lead and Child Health. U.S. public health officials believe that lead poisoning from historic uses of lead is the foremost preventable environmental health threat to children in the United States. In cooperation with federal agencies, PCEQ has undertaken a media-based educational campaign directed at parents of young children. The campaign will identify sources of lead poisoning, harmful effects, and simple, effective ways to reduce exposure. It also will provide a federal telephone hotline and information clearinghouse.

Partnerships Promotion. In 1992 PCEQ designed two projects to study environmental partnerships and promote additional partnerships. One project team sponsored case studies, analyses, and a workshop attended by experienced, grass-roots leaders to determine what conditions make natural resource conservation partnerships successful. The other team studied how partnerships among businesses, NGOs, and governments in the United States and other countries are contributing to more effective environmental management and government policies. Both teams prepared reports identifying methods and issues for further collaborative action.

Quality Environmental Management. This initiative epitomizes the entire PCEQ effort. Eleven major corporations are

undertaking voluntary demonstration projects at 12 facilities to apply the Total Quality Management (TQM) philosophy to the task of pollution prevention. Using quality improvement methods to eliminate inefficiencies that waste resources and cause pollution, this project is cutting emissions at targeted facilities and saving money at the same time. Specific goals were set to explore the TQM/pollution prevention process, devise credible measurements of progress, and identify incentives or barriers to success. The project team is preparing a report for publication in 1993 entitled "Total Quality Management: A Blueprint for Pollution Prevention."

Reducing Vehicle Emissions. PCEQ is attempting to demonstrate the viability of the "cash for clunkers" concept--generating air emission credits through accelerated retirement of older, heavier-polluting automobiles. PCEQ is augmenting an existing cash-for-clunkers project involving a PCEQ member company in Delaware by demonstrating a method for precise quantification of emission reductions. The project team will also analyze the cost-effectiveness of such programs and promote them among businesses and regulatory agencies.

U.S. Environmental Training Institute (USETI). With major support from PCEQ, the U.S. Environmental Training Institute trains participants from developing countries at U.S. companies and institutions to facilitate the transfer of cleaner technologies. Eight corporate and two non-profit PCEQ members

are assisting USETI by sponsoring site visits, conducting training classes, and providing scholarships. Two PCEQ participant companies are working with USETI to conduct an industrial technology cooperation project in the Republic of Indonesia.

Water Education and Conservation. PCEQ has joined an ongoing, long-term project of the National Geographic Society to raise national awareness of threats to freshwater resources and actions needed to assure the availability and quality of freshwater in the future. Commission members are creating partnerships to enhance water education and conservation, share expertise on water-related technologies, promote water conservation and clean-up projects at industrial facilities, and encourage conservation by the general public.

Workplace Waste Reduction. This project has produced a comprehensive solid waste reduction guide for such users as corporate offices and small businesses. The guide describes how to conduct an inventory of materials use and waste generation to encourage wider application of waste reduction practices throughout the business and retail sectors.

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**An Environmental Collaboration:
General Motors and the Environmental Defense Fund**

A giant automaker and a non-profit environmental group have teamed up to develop innovative strategies for reducing air pollution. The two organizations are focusing on expanding market-based incentives for

businesses to find cost-effective ways to clean up pollution. EDF will examine GM environmental programs and make assessments on the most cost-effective actions the company can take. The two organizations are working on an accelerated auto-scrappage program to take older, more polluting cars off the road in California.

President's Environment and Conservation Challenge Awards

In November 1992, for the second year, President Bush bestowed medals for excellence in the field of environmental conservation, just as Presidents long have honored Americans for excellence in the arts, humanities, sciences, and world affairs. The presidential medals for environmental achievement represent the nation's highest honor in this field. The President's Environment and Conservation Challenge Awards recognize citizens and organizations for outstanding contributions to the nation's environmental quality.

In 1992 an independent selection committee judged applications and selected 9 presidential medal recipients and 13 citation recipients in the following categories:

- Environmental Quality Management,
- Partnership,
- Innovation, and
- Education and Communication.

Descriptions of the nine medal recipients follow.

Save Our Everglades. This program to preserve and restore Florida's unique wetlands ecosystem includes restoration of the Kissimmee River and protection of Lake Okeechobee, state Water Conservation Areas, Big Cypress Swamp, the Florida panther, and other endangered wildlife. The program has acquired 290,000 acres of land and constructed 36 wildlife highway crossings and bridges to protect endangered species and improve hydrology. It also has helped pass landmark federal and state legislation. Partners include the State of Florida, 22 conservation groups that form the Everglades Coalition, the U.S. Army Corps of Engineers, the National Park Service, and the U.S. Fish and Wildlife Service.

Think Earth. The Southern California Think Earth Environmental Education Consortium, composed of 13 organizations, has developed and distributed an elementary school curriculum to teach children to conserve natural resources, reduce waste, and minimize pollution. Helping Think Earth reach one million students nationwide are the following consortium partners: Atlantic Richfield Company, City of Los Angeles, Education and Development Specialists, GTE California, Los Angeles Department of Water and Power, Metropolitan Water District of Southern California, Orange County Sanitation Districts, Sanitation Districts of Los Angeles County, South Coast Air Quality Management District, Southern California Edison, The Gas Company,

Ventura County Air Pollution Control District, and the Ventura Regional Sanitation District.

Energy Conservation Collaboration. The once unlikely union of an electric utility--the New England Electric System of Westboro, Massachusetts--and an environmental group--the Conservation Law Foundation of New England--has resulted in two major achievements: development of a successful energy conservation program and regulatory approval for a utility earnings incentive. The partners designed a new facility, known as the "powerplant that conservation built," that reduced the utility's air pollutants and the need for new capacity and saved consumers' and stockholders' money.

IBM Environmental Management and Conservation. IBM Corporation has demonstrated that a large company can institutionalize and practice environmental protection and conservation through sound policy practices, executive leadership, and employee commitment. The company's record of accomplishments results from meeting or exceeding government regulations and, where none exist, from setting and adhering to its own stringent standards.

Boston Park Plaza Environmental Action. The Boston Park Plaza Hotel and Towers has undertaken an environmental campaign with 85 initiatives involving all departments of the hotel. The environmental actions of this family-owned and operated landmark property demonstrate that the competitive hospitality service

industry can make changes that benefit the environment, while maintaining quality service and standards.

CFC Solvent Phase Out. In 1988 Northern Telecom, Inc., pledged and attained the complete phaseout of CFC-113 solvents from its 42 manufacturing and research operations worldwide. By the end of 1991, Northern Telecom, the first global telecommunications company to make such a pledge, had eliminated the use of these solvents in all of its operations. The phaseout reduced CFC solvent emissions into the atmosphere from 1,000 tons per year to zero in three years.

South Coast Recycled Auto Project (SCRAP). The Unocal Corporation sponsored SCRAP, an unprecedented effort to improve air quality in the Los Angeles Basin by scrapping heavily polluting, pre-1971 cars. In four months, the company purchased and crushed for recycling 8,376 old cars. SCRAP reduced air pollutants by 13 million pounds per year at a cost of 50 cents per pound.

People for Community Recovery. A grassroots environmental education and advocacy organization, People for Community Recovery, Inc., serves a predominantly low-income, African-American community in Chicago. PCR assesses environmental hazards in the community and mobilizes constituents to alleviate the hazards. Hazel Johnson, the group's founder and executive director, is a national leader in the grassroots environmental movement.

Chesapeake Bay Environmental Education. The Outdoor Environmental Education Program of the Chesapeake Bay Foundation provides field instruction in estuarine issues to students, teachers, and people throughout the Bay watershed. The goal is to create a constituency that not only values and understands the Bay but works to restore it. Hands-on water activities involve canoes, rowboats, skipjacks, powerboats, and work on a model low-input farm operated by the Foundation.

The President's Commission On Environmental Quality (PCEQ)

Member	Affiliation	Location
Edwin Artzt	Procter & Gamble Company	Cincinnati, OH
Riley Bechtel	Bechtel Group, Inc.	San Francisco, CA
Dean Buntrock	Waste Management, Inc.	Oak Brook, IL
Richard Clarke	Pacific Gas and Electric Company	San Francisco, CA
Derrick Crandall	American Recreation Coalition	Washington, DC
Michael Deland (Chairman)	Council on Environmental Quality	Washington, DC
Kenneth Derr	Chevron Corporation	San Francisco, CA
Robert Fri	Resources for the Future	Washington, DC
Kathryn Fuller	World Wildlife Fund	Washington, DC
John Georges	International Paper Company	Purchase, NY
Paul Gray	Massachusetts Institute of Technology	Cambridge, MA
Gilbert Grosvenor	National Geographic Society	Washington, DC
Allen Jacobson	3M Company	St. Paul, MN
Fred Krupp	Environmental Defense Fund	New York, NY
Kenneth Lay	Enron Corp.	Houston, TX
Richard Mayer	Kraft General Foods North America	Glenview, IL
Patrick Noonan	Conservation Fund	Arlington, VA
Harold Poling	Ford Motor Company	Dearborn, MI
Frank Popoff	The Dow Chemical Company	Midland, MI
William Ruckelshaus (Vice-Chair)	Browning-Ferris Industries, Inc.	Houston, TX
Adele Simmons	John D. and Catherine T. MacArthur Foundation	Chicago, IL
Roy Vagelos	Merck & Company, Inc.	Rahway, NJ
John Welch, Jr.	General Electric Company	Fairfield, CT

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Medal and citation recipients in the President's Environment and Conservation Challenge Awards Program, 1992.

Category	Medal	Citation
Partnership	Florida Save Our Everglades Program; State of Florida and partners, Tallahassee, FL	Compressed Natural Gas Vehicle Conversion Projects; New Mexico Department of Energy, Minerals, and Natural Resources, Santa Fe, NM, and the Gas Company of New Mexico, Albuquerque, NM
	Think Earth Environmental Education Program; Southern California "Think Earth" Environmental Education Consortium, Lakewood, CA	Santa Rosa Plateau Agreement; Metropolitan Water District of Southern California and partners, Los Angeles, CA
	Energy Conservation Collaborative Effort; New England Electric System, Westboro, MA, and the Conservation Law Foundation of New England, Boston, MA	Keep Texas Beautiful; Keep Texas Beautiful, Inc., Austin, TX Partnership for Wetlands Conservation; The Dow Chemical Company and partners, Midland, MI

Environmental Quality Management	Environmental Management and Conservation Programs; IBM Corporation, Stamford, CT	Corporate Environmental Policies; 3COM Corporation, Santa Clara, CA
	Boston Park Plaza Hotel and Towers Environmental Action Program; Saunders Hotels Group, Inc., Boston, MA	

Innovation	CFC Solvent Phase Out; Northern Telecom, Inc., Nashville, TN	Georgia No-Tillage Assistance Program; Georgia Office of Energy Resources, Atlanta, GA
	South Coast Recycled Auto Project (SCRAP); Unocal Corporation, Los Angeles, CA	Jefferson North Project; Chrysler Corporation, Detroit, MI
		"Great Lakes Recycle" Program; Council of Great Lakes Governors, Chicago, IL Innovative Source Reduction; Procter & Gamble Company, Cincinnati, OH

Education and Communications	People for Community Recovery; People for Community Recovery, Inc., Chicago, IL	Save Our Streams; Save Our Streams, Glen Burnie, MD
	Environmental Education Program; Chesapeake Bay Foundation, Annapolis, MD	Earth Matters; Hannaford Brothers Co., Scarborough, ME
		Chesapeake Bay License Plate Program; State of Maryland, Annapolis, MD Project CENTS; Tennessee Conservation League, Nashville, TN

PUBLIC LANDS

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

The U.S. government manages natural resources on federal lands to provide for the needs of present and future generations. A policy of sustainable multiple use provides range, timber, minerals, watersheds, fish and wildlife habitat, wilderness, and recreation, while maintaining scenic and cultural values. Protected from unregulated development, public lands support resource development that sustains the long-term productivity of soils, waters, plants, and animals. Some federal lands and natural resources are managed for special uses, such as parks, military training, grazing, endangered species, and outdoor recreation. For example, on lands managed by the departments of Agriculture and Interior, 95 million acres (15 percent) are designated wilderness.

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Federal Land Management Agencies

The following federal agencies manage 666 million acres of public lands:

Department	Agency	Land
		<u>million acres</u>
Interior	Bureau of Land Management	270
Agriculture	Forest Service	191
Interior	Fish and Wildlife Service	92
Interior	National Park Service	80

Defense	Army/Air Force/Navy/Marines	25
Interior	Bureau of Reclamation	8

Conditions and Trends

In 1992 public land management reflected the nation's demand for a balance between economic and environmental values. Federal land managers worked to meet the public desire to protect natural landscapes while providing resources for economic growth. Increased populations in the western states influence federal land management, which no longer occurs in isolated settings but in proximity to residential areas. Today federal land managers coordinate actions closely with states, municipalities, and the private sector.

Policies and Programs

In 1992 federal land agencies continued to take a leadership role in defining new ways to achieve effective stewardship of natural resources.

Public Rangelands

Together the Bureau of Land Management (BLM) and the USDA Forest Service manage a quarter of a billion acres of land available for use by livestock. Grazing fees for federal pastures remain a controversial issue.

Bureau of Land Management. BLM manages 170 million acres of

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rangelands, some in poor condition because of past livestock overgrazing, agricultural and commercial misuse, and off-road vehicle abuse. Fifty years ago, a third of BLM rangelands were in poor condition with only 16 percent in good to excellent condition. In 1991 rangelands in poor condition were down by half, while rangelands in good to excellent condition had increased to 36 percent, with an overall 87 percent in stable or improving condition. BLM is committed to increasing rangelands in good to excellent condition to 40 percent and to reducing those in poor condition to 10 percent. The Bureau also has set a goal for establishing environmental balance on 75 percent of properly functioning riparian-wetlands areas by 1997. For more information, see the Wetlands section.

BLM improves rangeland conditions by means of grazing management systems, protective fencing, water development in the uplands, plantings, and reseeding. Examples follow.

- **Incentive-Based Grazing Fees.** Grazing fees for the use of federal lands are a contentious issue addressed annually by legislation. In 1992 the fee was \$1.92 per animal-unit month (one cow and calf per month or its equivalent). In 1991 BLM collected \$19 million in grazing fees. A BLM task force has developed a proposal that would give ranchers an incentive to improve leased federal lands. Incentive-based grazing fees could improve range management without significantly increasing

the program budget. Although participation in incentive programs would be optional, ranchers who chose not to adopt sound management practices that maintain or improve rangeland, would pay significantly higher fees.

- **Coordinated Interdisciplinary Resource Monitoring.** CRIM consolidates rangeland monitoring in a unified data-collection effort for all BLM programs. The monitoring system provides information on which to evaluate management and helps select best management practices.
- **Desired Plant Community.** DPC is a vegetation management strategy to achieve plant communities that best meet the overall needs of the public, wildlife, and livestock. Such communities, at the same time, protect water, soil, vegetation, and air.

Forest Service. Of the 191 million acres managed by the USDA Forest Service, 100 million acres are available for use by domestic livestock. A new Change-on-the-Range philosophy advocates ecology-based range management to accomplish resource stewardship and provide healthy rangeland ecosystems. In 1992 the Forest Service implemented a new information reporting system to measure the health of rangelands. A sampling of other projects follows.

- **Grazing Fees.** The Forest Service administered 9,798 grazing allotments in 33 states in 1992. Grazing fees varied from \$1.92 to \$3.92 per animal-unit month. Fees

collected from public grazing on national forests--excluding national grasslands--totaled \$9.7 million in 1991 and \$8.8 million in 1992.

- **Video Documentary.** In 1992 the Forest Service and the American Farm Bureau produced and distributed a video documentary featuring on-the-ground ecological range management.
- **Noxious Weeds.** A 1992 Noxious Weed Workshop, designed for range managers, had as cosponsors: the Forest Service, BLM, Western Weed Coordinating Committee, Inter-mountain Noxious Weed Advisory Council, Nevada State Department of Agriculture, Montana State Department of Agriculture, and Montana Weed Control Association.
- **Livestock and Big Game.** A 1992 Livestock-Big Game Workshop addressed conflicts that can arise when managing livestock and big game species on national forests and neighboring private lands. Cosponsors were the Forest Service, National Cattlemen's Association, Public Lands Council, International Association of Fish and Wildlife Agencies, and the Wildlife Management Institute.

Energy and Minerals

In fiscal 1991 and 1992 onshore and offshore energy minerals leases provided \$4.3 billion in revenue to the U.S. Treasury, the Historic Preservation Fund, the Land and Water Conservation Fund,

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Indian tribes, and the states. Leasable minerals include oil and gas, coal, geothermal energy, phosphate, and, to a limited extent, hardrock minerals. BLM administers federal lands and interests that contain the nation's onshore mineral resources, and the Minerals Management Service manages the mineral leasing and development on the outer continental shelf.

Bureau of Land Management. BLM fosters development of onshore minerals to achieve sustained yield, multiple use, and conservation of natural resources. Federal lands subject to surface and subsurface mineral development total 732 million acres, of which 272 million acres are surface and subsurface rights on BLM lands. The remaining 460 million acres are acquired lands, lands that have been patented with minerals reserved to the United States, and public lands on which minerals are administered jointly by BLM and other agencies, such as the National Park Service and the USDA Forest Service.

In fiscal 1991 non-energy leasable mineral development on federal lands provided \$83 million in lease revenue. Of the \$31 billion contributed to the gross national product by nonfuel minerals produced in the United States, federal lands in the West figured prominently. These lands hold a large volume of potentially minable resources--gold, copper, and other hardrock minerals. Policy debate continues over the environmental and economic aspects of hardrock mining.

Mineral Management Service. The nation's outer continental

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shelf (OCS) encompasses 1.2 billion acres. A portion of revenues derived from offshore oil and gas leases are designated to help preserve marine habitats, including biodiversity and historic and cultural resources. The OCS Program provides 80 percent of revenues credited to the Land and Water Conservation Fund (L&WCF). OCS revenues supplied the Fund with \$843.8 million in fiscal 1990; \$885 million in fiscal 1991; and \$888 million in fiscal 1992.

[box with screen]

Mining on the National Forests

The Forest Service manages lands with mineral deposits to ensure that surface development is conducted in an environmentally acceptable manner and that lands are restored to a productive condition. The mining industry assists by funding environmental studies and mitigation, such as fish, wildlife, and recreation enhancement projects. Estimated industry contributions for environmental studies in 1992 were \$5 million. The Forest Service minerals program covers both leasable and locatable minerals. In 1992 a total of 12 million acres were under lease, mostly for oil and gas. The Forest Service reviews proposals for leasing, informs BLM which lands can be made available, and approves surface-use operating and reclamation plans after leases are issued. Accomplishments in 1992 included the following:

- Production of 12 million barrels of oil and 210 billion cubic feet of gas from 2,300 wells on 12 million acres of leased land, disturbing only 11,500 acres (0.1 percent) of the land leased.
- Opening, on the Inyo National Forest in California, of the first geothermal powerplant on National Forest System (NFS) lands.
- Decline in land leased for oil and gas, from 35 million acres in 1983 to 12 million acres in 1992, reflecting the affect of economic conditions on the industry.
- Production from the largest surface coal mine in the world, a mine on NFS lands in Wyoming, of 3 percent of all coal mined in the nation.

- Over 5.5 million tons of phosphates, with a market value of \$137.5 million, produced from leases on NFS lands in Idaho.

Locatable minerals, available for development under the Mining Law of 1872, include gold, silver, copper, zinc, and other minerals. The Forest Service regulates locatable mineral operations to mitigate environmental effects to surface resources and to ensure reclamation. Producing mines total 1,200 out of 500,000 mining claims on 10 million acres of NFS lands, primarily in the West. Only 44,000 acres (0.4 percent of total land under claim) are disturbed as a result of ongoing locatable mineral operations, while 100,000 acres are in various stages of reclamation.

Watchable Wildlife

Federal land agencies have formed Watchable Wildlife partnerships with groups such as Defenders of Wildlife, National Audubon Society, National Wildlife Federation, and Izaak Walton League. The project attempts to preserve native species for current and future generations to enjoy. Begun in 1988, it is a nationwide effort to increase wildlife viewing opportunities, provide information on the needs of wildlife, and promote wildlife conservation. BLM maintains 159 viewing sites in 11 western states, and the Forest Service maintains 165 viewing areas with plans for an additional 220. Accomplishments for 1992 included the following:

- **Big Horn Sheep Viewing Area.** BLM, the Forest Service, Colorado Division of Wildlife, Bighorn Sheep Society, and the City of Georgetown established this Watchable Wildlife viewing area, 30 miles west of Denver.

- **Viewing Guides.** Watchable Wildlife cooperators have published 12 state viewing guides and are planning to complete guides for most of the 50 states. In 1992 the National Park Service, National Park Foundation, and National Fish and Wildlife Foundation prepared a viewing guide for Watchable Wildlife in the National Parks, and the Forest Service launched Eyes on Wildlife for the National Forest System.
- **National Conference.** In 1992 a National Watchable Wildlife Conference gathered and disseminated information on tools for creating viewing areas nationwide.

Recreational Fisheries

In May 1992 the Forest Service and BLM cosponsored a meeting of government fisheries managers to promote a joint policy to improve the quality and quantity of recreational fishing on public lands. A sampling of projects follows.

Fish and Wildlife 2000. BLM issued the first comprehensive plan for managing its wildlife and fisheries resources. Since 1985 BLM has received \$11.8 million in federal appropriations, matched by \$18 million from private sources, to complete 1,200 wildlife and fisheries projects.

California Water 2002. As part of its environmental program, the Bureau of Reclamation sponsors the following initiatives in California:

- Contracting with the state to purchase and install salmon spawning gravels in the upper Sacramento River,
- Improving the water supply for the Nimbus Fish Hatchery,
- Contracting for a firm water supply to wildlife refuges in the Central Valley, and
- Initiating a demonstration cost-sharing program with nonfederal diverters to remedy the fish-screen effects of pump and direct-water diversion facilities on the Sacramento and San Joaquin rivers and in the Delta.

Pathway to Fishing. In 1992 five federal agencies and two private groups signed a memorandum of understanding to work together toward a common goal--to advance angler skills, ethics, and stewardship of fisheries resources on federal lands and waters. Cooperating in the effort are the USDA Forest Service; four DOI agencies--Bureau of Reclamation, Fish and Wildlife Service, National Park Service, and Bureau of Land Management; Berkley, Inc.; and In-Fishermen, Inc. The cooperators have produced an instructional kit called Pathways to Fishing that introduces the public to fishing, fish biology, and aquatic ecology. Kits are available from the Government Printing Office.

Fish and Wildlife Habitats

The Fish and Wildlife Service manages 90 million acres of national wildlife refuges, administers the Endangered Species Act,

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provides consultations on water development and water quality under the Fish and Wildlife Coordination Act and section 404 of the Clean Water Act, operates fish hatcheries, and provides grants to states under the Federal Aid in Sport Fish Restoration and Federal Aid in Wildlife Restoration acts. FWS is conducting a management review of the National Wildlife Refuge System to meet the nation's needs and interests through 2003, the 100th anniversary of America's first national wildlife refuge. Refuges 2003, a combined management plan and environmental impact statement, will chart the course of the system for the next decade, considering facility and land needs for an increasing population. To encourage public involvement in the planning process, FWS has held 31 public meetings around the country and has received tens of thousands of public comments.

Celebrate Wildflowers

In 1992 the Forest Service organized Celebrate Wildflowers, an annual, national event to emphasize wildflower appreciation by agency personnel and the public. Underscoring the event is an intensified effort by the Forest Service to inventory rare plants and implement conservation and recovery strategies. This objective is reflected in the number of Forest Service botanists, up from 32 in 1989 to 104 in 1992.

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America's Great Outdoors

The President's recreation initiative, America's Great Outdoors, promotes interpretation and education, improved facilities, and acquisition of new recreational lands.

Forest Service. The national forests are the most visited federal lands, with 597.6 million visits per year. In 1992 the Forest Service improved recreational access for visitors, including those with disabilities. The agency expanded interpretive programs for cultural resources, developed new partnerships for interpretive programs, and joined interagency partnerships to encourage domestic and international tourism on federal lands. A visitor day equals 12 visitor hours by one or more persons, and in 1992 national forests and grasslands recorded 279 million recreation visitor days, a 6-percent increase over 1990.

National Park Service. In August 1992 President Bush signed a law establishing Marsh-Billings National Historical Park, the first national park in Vermont. The 550-acre hillside site includes a mansion that was the boyhood home of George Perkins Marsh, who in 1864 wrote Man and Nature, a book that inspired the early conservation movement in America.

In 1992 land acquisition for national parks continued, but it can not solve seasonal or site-specific crowding; Yellowstone and Yosemite likely will remain among the nation's favorites, with summer months the most popular visitation times. In 1991 the 361 units of the National Park System recorded 268 million recreation

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visits, up from 154 million visits to 284 units in 1971. Although entrance to most national parks is not subject to specified capacity limits, some rivers and backcountry areas are restricted to permit holders to avoid overcrowding and natural resource degradation. The National Park Service, in conjunction with public and private organizations, has introduced measures to minimize traffic congestion, including the operation of visitor transportation systems in 12 park areas. Private concessionaires and others outside the parks also provide transportation services for visitors.

Private Concessions on Public Lands. In 1992 to improve management of the private concerns that operate concessions such as hotels, restaurants, and ski resorts on public lands, a Concessions Management Task Force, with members from DOI land management agencies, the USDA Forest Service, and the Army Corps of Engineers, issued a draft report. The task force recommended maintaining financial consistency among agencies, increasing competition by setting appropriate fees and durations of agreements, and integrating concessions management into federal planning.

Wilderness

Since 1964 Congress has set aside 95 million acres of wilderness in 548 units of the National Wilderness Preservation System, largely by designating existing roadless areas on national

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forests and Department of the Interior lands, rather than by adding new lands to the federal estate.

Bureau of Land Management. In 1992 BLM completed a 15-year wilderness review mandated by the Federal Land Policy and Management Act of 1976. The review covered 26 million acres of lands in 750 wilderness study areas in nine western states. In response the Secretary of the Interior recommended for wilderness designation 330 units of BLM lands in nine western states for a total of 10 million acres, and the President transmitted the following recommendations to Congress:

- **California**, 62 wilderness areas with 2.3 million acres;
- **Idaho**, 27 wilderness areas with 1 million acres;
- **Nevada**, 52 wilderness areas with 1.9 million acres;
- **New Mexico**, 23 wilderness areas with .5 million acres;
- **Oregon**, 49 wilderness areas with 1.3 million acres; and
- **Utah**, 69 wilderness areas with 1.9 million acres.

Forest Service. The USDA Forest Service manages 33.6 million acres of wilderness in 382 units. In December 1991 the President signed the Chattahoochee Forest Protection Act, adding 25,840 acres of national forests in Georgia to the National Wilderness Preservation System. In June 1992 the President signed the Los Padres Condor Range and River Protection Act, adding 400,400 acres of national forests in California to the system. Congress considered but did not pass legislation that would have created

Wild and Scenic Rivers

The National Wild and Scenic River System consists of 151 designated rivers with a total of 10,410 protected river miles. The Forest Service manages 96 of these rivers with a total of 4,316 miles, and BLM manages 32 rivers in five states for 1,991 miles. In fiscal 1992 Congress designated 26 new rivers on national forests for a total of 914 miles in the following states:

- **Michigan**, 14 rivers on the Hiawatha, Ottawa, and Huron-Manistee national forests;
- **Arkansas**, 8 rivers on the Ozark and Ouachita national forests;
- **California**, 3 coastal streams on the Los Padres National Forest; and
- **Pennsylvania**, 85 miles of the Allegheny River on the Allegheny National Forest.

Congress considered but did not pass bills that would have added 112 miles of the lower Salmon River in Idaho, along with sections of the Merced River in California, the Rio Grande in New Mexico, and the Black Canyon of the Crunnison River in Colorado.

Special Recreation Areas

The National Forest System contains 42 Congressionally designated recreation areas, encompassing 7 million acres and

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including 18 national recreation areas, 5 national scenic areas, 4 national monuments, and 15 other recreation areas. In 1992 Congress added the following lands on the Chattahoochee National Forest in Georgia:

- **Coosa Bald National Scenic Area**, a 7,100-acre scenic area that features the southern Appalachian "bald" vegetative type;
- **Springer Mountain National Recreation Area**, a 23,330-acre recreation area that marks the southern terminus of the Appalachian Trail.

America the Beautiful

The President's America the Beautiful (ATB) initiative calls for enhanced recreational opportunities on public lands. After revitalizing the Land and Water Conservation Fund (L&WCF) as a mechanism for acquiring new recreational lands, the President proposed the purchase of 174,991 acres of special land in 25 states. L&WCF grants funded state and local government acquisitions of parklands and development of outdoor recreation facilities. From its inception in 1965 through 1991, the L&WCF assisted 36,000 projects with \$5.5 million; in fiscal 1992 alone, the Fund awarded 250 grants totaling \$15 million for basic recreation development and 35 grants for acquisition of 8,493 acres of park and open-space lands. ATB has initiated cost-sharing partnerships with states, local governments, and private entities

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to protect and preserve natural and cultural resources. Examples
follow.

Federal Land Acquisition. As of September 1992 the Forest Service had acquired 166,781 acres of new recreational lands for \$107.5 million. In fiscal 1992 BLM acquired 189,426 acres of land for protection and recreation, FWS acquired 89,750 acres, and NPS acquired 153,675 acres for a total of 432,851 acres at a cost of \$229 million. Examples follow.

- **Balcones Canyonland National Wildlife Refuge.** This Austin, Texas, refuge provides habitat for seven federally listed endangered species and other rare and potentially threatened species, including the black-capped vireo and the golden-cheeked warbler.
- **Fox River Trail.** After 11 years of efforts by 11 local jurisdictions and \$3 million in seven acquisition and development grants, this trail in suburban Chicago is now a 70-mile long scenic path along the Fox River.
- **Pompey's Pillar.** In 1992 BLM acquired a 366-acre landmark property on the Lewis and Clark National Historic Trail in Montana. The site features a large rock outcropping that bears the nation's only physical evidence of the Lewis and Clark expedition--the carved signature of Captain William Clark. The acquisition includes 200 acres of wetlands.
- **Stillwater National Wildlife Refuge.** To increase

wetlands and dilute elevated levels of harmful trace metals in this staging area for spring and fall migrations of shorebirds, swans, geese, and bald eagles and duck breeding site, the Fish and Wildlife Service, The Nature Conservancy, and the State of Nevada signed a cooperative agreement to purchase water rights and land from willing sellers to sustain 25,000 acres of wetlands habitat. In 1992 FWS prepared a draft environmental impact statement for acquiring water for wetlands and initiated socio-economic and hydrological studies.

Legacy '99 Corrective Actions. DOI is improving the infrastructure on 450 million acres of national parks, wildlife refuges, and other public lands. The goal is to clean up hazardous materials, increase maintenance, rehabilitate facilities, and inspect 383 DOI dams. In 1992 the dam safety program recorded 194 dam inspections with corrective actions on 12 dams. BLM completed the first-phase assessment of 47 sites potentially contaminated by hazardous materials and completed a follow-up study on a classified high-risk site to determine the best method of cleanup.

Recreation and Resource Protection. BLM sponsored 330 challenge cost-share projects to protect natural resources at recreational sites, and the Fish and Wildlife Service sponsored 211, such as the following:

- **Byways System.** Since its inception in 1989, the National

Byways System has established 50 back-country byways--roads that extend through remote scenic corridors--with 2,450 miles in 11 states. BLM and private organizations such as Farmers Insurance and American Isuzu fund interpretive kiosks at entry points and cooperate on improvement and maintenance.

- **Off-Highway Vehicle Project.** BLM signed a memorandum of understanding with the Motorcycle Industry Council (MIC) and the Specialty Vehicle Institute of America (SVIA) to protect public lands by promoting safe and responsible off-highway vehicle recreation. The private groups, which serve as a clearinghouse for resource information and as a link between BLM and riding clubs, have published, "Right Rider," a series of four brochures for the general public. BLM provides expertise on OHV management and involves riders in planning, developing, and maintaining trails.

[Box with screen]

Protecting American Battlefields

To promote public stewardship of historic battlefields, the American Battlefield Protection Program, a public-private partnership begun in 1990, identifies sites in critical need of protection.

- **Civil War Legacy 2000.** The Civil War Trust leads a fundraising campaign to raise \$200 million by the year 2000 to assist federal, state, local, and private efforts to acquire and protect historic battlefields.
- **Shenandoah Valley Study.** The National Park Service completed a study of 15 battlefields

in the Shenandoah Valley of Virginia in response to the Civil War Sites Study Act of 1990. The NPS Battlefield Protection Program provided technical assistance to local organizations involved in the study, which assessed needs and developed preservation strategies.

- **Priority Civil War Sites.** In 1992 NPS entered cooperative agreements with organizations at priority Civil War sites to assist with interpretation and preservation. Cooperators include local governments, property owners, the Civil War Battlefield Foundation, National Trust for Historic Preservation, Civil War Society, and Association for the Preservation of Civil War Sites.
-

Partnerships

Partnerships between public and private agencies maximize the effectiveness of federal funds and encourage private-sector involvement in preserving natural and cultural resources. Independent cost-sharing grant programs or in-kind grants from private individuals, groups, or organizations support public land management.

Habitat Improvement. The Forest Service administers a Challenge Cost-Share Program, which has increased from 57 partnerships in 1986 to 2,500 partnerships in 1992. During the year, partners turned \$12 million in federal funds into \$31.4 million in habitat improvements. BLM enlists partners such as the "Global ReLEAF" program, sponsored by the American Forestry Association, which in 1992 assisted public land restoration in

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Nevada, New Mexico, Wyoming, and Arizona. In the Nevada project, 150 volunteers planted aspen, cottonwood, willow, and other shrubs along the Marys River to restore habitat for the Lahonton cutthroat trout. Partners were BLM, Nevada Mining Association, Nevada Chapter of Trout Unlimited, Fish and Wildlife Foundation, and Global ReLEAF.

Take Pride in America. This national public awareness campaign encourages responsibility and pride in America's natural, historic, and cultural resources. The program relies on volunteers and in-kind contributions from private sources on efforts such as the following:

- **America's Treeways.** Federal, state, and private groups are cosponsoring this program, in which volunteers plant hundreds of thousands of trees donated by forest industries along U.S. highways.
- **U.S. Virgin Islands Cleanup.** Sponsored by a coalition of community groups, this project enlists volunteers of all ages to adopt an area--beach, park, or roadway--and accept responsibility for its cleanup.
- **National River Cleanup Week.** A new event, sponsored in 1992 by several federal agencies and national conservation groups, resulted in the cleanup of 6,000 miles of rivers by 20,000 volunteers.

TECHNOLOGY

Also see Energy, International, Pollution Prevention, and related tables and figures in Part II.

Technology comprises the methods and machinery used to apply scientific knowledge to certain objectives. Technologies therefore can be the cause of an environmental problem or its solution.

Conditions and Trends

More than ever before, U.S. private and public research organizations are developing, implementing, and marketing technologies to fix environmental problems or achieve particular social objectives with the least possible impact on the environment.

A Growing Global Market

The size of the market for environmental technologies is large and growing. Various official studies have estimated that the global market for environmental goods and services is in the range of \$200-300 billion per year and rising by 5-10 percent per year, with a growing proportion available to U.S. exporters. Further growth in this field will result from new international environmental accords, increased government investment in broad categories of technology, and market-based environmental programs such as the 1990 Clean Air Act Amendments, which create economic

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incentives for pollution prevention.

Increased Public-Private Collaboration

The federal government funds just under half of all research and development (R&D) in the United States, but it performs only about 10 percent in its own laboratories; nearly 75 percent is done by industry and about 10 percent by academia. Recognizing the national economic benefits to be gained from increased public-private cooperation on technology R&D, Congress enacted the Federal Technology Transfer Act of 1986. Under provisions of the act, between 1990 and 1991, the number of cooperative research and development agreements (CRADAs) between government labs and private companies increased from 460 to 730, with a total number to date of 1,100. Approximately 25 percent of CRADAs are with small businesses; a large portion involve technologies that are relevant to environmental protection.

Identifying Environmental Technologies

Several recent studies of national technology priorities note the importance of cleaner, more efficient methods in everything from manufacturing to transportation to agriculture. For example, the Twenty-first Annual Report of the Council on Environmental Quality (1991) reviewed current programs, as well as policy reforms needed, to spur technology that prevents pollution. A 1992 report of the World Resources Institute (WRI), a private, nonprofit

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environmental group, proposed a list of environmentally "critical"
technologies as being those with the following criteria:

- o Their use brings about large, cost-effective reduction in environmental risk;
- o They embody a significant technical advance;
- o They are "generic"--applicable to broad sets of problems--and "precompetitive"--at a stage where R&D costs are too high for any particular company to bring it to market;
- o Their adoption involves a favorable ratio of social-to-private returns.

Both the CEQ and WRI studies noted that many technologies developed primarily for non-environmental purposes, such as supercomputers and computer-integrated manufacturing, may also have significant environmental uses.

[TABLES 1 AND 2]

Policies and Programs

Because technology diffusion is pervasive and rapid in modern society, no government can successfully centralize and direct technology development. However, the United States Government supports and influences technology R&D through a variety of programs. Partnerships involving many federal departments, agencies, and private organizations create economies of scale and enhance innovation.

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Federal Research and Development

The Office of Science and Technology Policy (OSTP) in the Executive Office of the President coordinates and integrates federally sponsored science and technology development through an interagency mechanism known as the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET). Much of the research conducted through FCCSET is relevant to long-term environmental issues. In addition, several other agency-specific and interagency technology development projects are underway. A sampling of these initiatives follows.

Committee on Industry and Technology (CIT). Coordinated by FCCSET, this committee supports research and assists private industry in the development of technology. CIT sponsors an interagency initiative in Advanced Manufacturing Technology (AMT), whose environmental component emphasizes development in:

- o "Environmentally benign" manufacturing processes,
- o Waste minimization,
- o Advanced pollution monitoring and sensors, and
- o Closed-loop recycling.

Subcommittee on Environmental Technology (SET). Administered by the FCCSET Committee on Earth and Environmental Sciences, SET fosters interagency coordination for the research, development, and demonstration of solutions to environmental problems. SET coordinates efforts on:

- o Basic research for innovative technologies,

- o Applied research for solving environmental problems, and
- o Demonstrations or pilot projects to foster rapid application of new technology products.

Private Enterprise/Government Interaction (PEGI). The FCCSET Committee on Earth and Environmental Sciences also administers the PEGI Task Group, which facilitates research and development (R&D) interactions and collaborative efforts between the private sector and federal agencies, with an emphasis on global change issues. In 1992 PEGI collaborated with the Electric Power Research Institute, GEOSAT, Gas Research Institute, and American Petroleum Institute.

Strategic Environmental Research and Development Program (SERDP). In 1990 the Congress directed the Department of Defense (DOD) and the Department of Energy (DOE) to establish SERDP to identify DOD and DOE programs that were developed for defense purposes but which also could have useful applications in the environmental field. For example, data gleaned from submarines and orbiting satellites could help scientists track long-term environmental changes. The SERDP also conducts environmental research with private sector and government organizations.

NICE³ Program. Established in 1991, the National Industrial Competitiveness through Efficiency--Environment, Energy, and Economics program (NICE³) is a \$2 million grant program jointly administered by the Department of Commerce (DOC), the Environmental Protection Agency (EPA), and DOE to fund development of generic,

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precompetitive technology to enhance industrial competitiveness through improved energy efficiency. Grants are awarded to state and industry consortia to develop energy efficient technologies with promise of commercial viability for U.S. industry. For example, a project was funded in Ohio to develop a new curing system for solvents in the manufacture of pressure-sensitive labels. This technology could result in an estimated savings of 604 billion British Thermal Units (BTU) per year, with an annual reduction of 7 million pounds of hazardous waste.

Innovative Concepts Program (InnCon). Sponsored by DOE, EPA, and the Department of the Interior, InnCon provides seed money in amounts up to \$20,000 to innovators who develop energy efficient technology and processes that increase industrial productivity. The program also supports innovators by publicizing their concepts and by introducing them to potential sponsors. The program, in its sixth year, has provided \$11.5 million in funding for innovative environmental technology.

EPA Technology Innovation Office. This office promotes new methods for cleanup problems such as contaminated soils or groundwater. In 1991 EPA conducted 21 pilot and full-scale field demonstrations of new technologies prior to commercialization and scheduled 74 new technologies for demonstration. Among the techniques tested in 1992 were soil washing, chemical dechlorination, underground vacuum extraction, and forcing airstreams through water to evaporate volatile organic compounds.

EPA also evaluated bioremediation--the use of microbes to break down organic contaminants--at demonstration cleanups across the country.

U.S. Bureau of Mines, Division of Environmental Technology.

This office conducts research on innovative ways to do the following:

- o reduce the volume and toxicity of mining and minerals processing wastes,
- o identify hazardous waste sites contaminated with heavy metals and other toxic constituents, and
- o mitigate the environmental impacts resulting from active and abandoned coal and non-coal mining.

Recent work has applied biotechnology to remediate toxic and hazardous waste sites created by mining, minerals processing, and related industries. These projects also provide a foundation for environmental regulatory analysis and development.

Marketing New Technologies

To complement its support for environmental technology R&D, the federal government also administers programs designed to speed the commercialization and deployment of new technologies.

National Technology Initiative. DOC, DOE, and EPA sponsor this initiative to promote public/private cooperation on technology development and commercialization. In 1992 the agencies cosponsored a series of 10 conferences for entrepreneurs across the

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country. Conferences in _____, _____, and
_____ focused on environmental technology.

Cooperative Research Centers/Engineering Research Centers.
Funded by the National Science Foundation, this program established a network of cross-disciplinary centers at major research universities, linking academia and industry. Twenty-three programs are involved with twenty-one universities and are located in sixteen states around the nation. The centers focus on environmental problems and technology solutions in fields such as microelectronics, telecommunications, biotechnology, energy resource and recovery, and design and manufacturing.

International Technology Cooperation

As world leaders in science and technology, Americans work with their counterparts in other nations to develop and share technological advances. In particular, the United States supports an active program of environmental technology cooperation with developing nations and those making the transition to market economies. Cooperation takes the form of information exchange, training and technical assistance, and financial assistance for particular projects. A sampling of current programs follows.

United States-Asia Environmental Partnership (US-AEP). A coalition of U.S. and Asian businesses, governments, and community groups, US-AEP was established to enhance the environment and to promote economic progress in the Asia-Pacific region. Centers are

being established in Hong Kong, Taiwan, the Philippines, and India; other sites are being considered Malaysia, Singapore, Thailand, Indonesia, and Korea.

The partnership program has four components: technology cooperation, environmental fellowships and training, environmental infrastructure, and a regional biodiversity conservation network. The technology cooperation component fosters opportunities through trade, investment, and business exchanges. Environmental Business Centers will be established in Asia to support trade and investment linkages. The U.S. side of the program is administered by AID with input from 20 federal agencies.

U.S. Environmental Training Institute (USETI). Established in 1992, USETI provides training to professionals from the public and private sectors of developing countries. Five courses were offered in 1992 in U.S. facilities in such topics as advanced landfill management, bioremediation, and restoration of nuclear sites. These courses were offered to environmental professionals from Thailand, India, Hong Kong, Morocco, South Korea, Taiwan, Mexico, Indonesia, the Philippines, and Puerto Rico. Ten or more courses will be offered in 1993. USETI is a joint effort of U.S. industry, and seven federal agencies.

Climate Country Studies. The United States has committed \$25 million over two years to assist developing nations with needs assessments and reporting obligations under the United Nations Framework Convention on Climate Change. Country studies will

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facilitate future U.S. assistance to developing nations in taking actions to mitigate and adapt to climate change.

Energy Efficiency Programs. Several federal departments and agencies support international energy efficiency programs:

- o **CORECT.** The interagency Committee on Renewable Energy, Commerce and Trade (CORECT), consisting of members from DOC, DOE, and the U.S. Agency for International Development (AID), focuses on market assessments for export of renewable energy technologies. CORECT has supported photovoltaics in the Dominican Republic, wind systems in Guatemala, and geothermal energy in Honduras.
- o **Clearinghouse.** An Environmental and Energy Efficient Technology Transfer Clearinghouse supported by AID, EPA, and DOE provides information on pollution control, renewable energy, and energy efficient technologies. Pilot programs have been established in Mexico City and Vienna.
- o **ADEPT.** The Assisting Deployment of Energy Practices and Technologies program (ADEPT) will assist nations in choosing and applying energy technologies, with an emphasis on indigenous fuel sources including biomass, geothermal, solar, wind, and improved efficiency in fossil fuel use. ADEPT ventures will be jointly sponsored by DOE and host country governments and involve personnel from U.S. national laboratories, industrial

groups, and host country counterparts.

- o **21st Century Program.** Through the America's 21st Century Program, DOE will assist the U.S. renewable energy industry in forming joint ventures with the nations of Latin America and the Caribbean.
- o **Other programs.** DOE has also helped various countries capture methane released in coal-mining, develop small hydropower projects, and conserve electricity through demand-side management.

National Environmental Technology Applications Corporation (NETAC). Established in 1988 at the University of Pittsburgh's Applied Research Center with funding from EPA and the private sector, NETAC works to accelerate the diffusion of environmental technologies at home and abroad. NETAC has undertaken 11 cooperative technology cooperation projects in Eastern and Central Europe and the former Soviet Union, involving such organizations as AID, the U.S. Information Agency, and the World Wildlife Fund, a nonprofit group. In one example, NETAC conducted an independent evaluation of a biological remediation process, and their summarized final reports were used by the client to successfully market this technology.

TRANSPORTATION

Also see Air Quality, Energy, International Issues, Wetlands, and related tables and figures in Part II.

The mobility of people and goods is essential to national wellbeing and competitiveness in the world marketplace. The vast U.S. transportation system is a key to the nation's dynamism and freedom. At the same time, transportation consumes much energy and space and produces a large portion of the nation's pollution problems. The transportation corridor and infrastructure can contribute to habitat stress and ecosystem disruption, and transportation accidents involving hazardous cargoes can have major adverse impacts on human health and the environment.

Conditions and Trends

The U.S. transportation network is an ever-changing complex of public and private roads, airports, transit systems, railroads, ports, waterways, and pipelines. In the 1990s the nation is asking transportation planners to ensure that the system grows and operates in a manner compatible with the environment.

During this century and especially since the 1950s, the U.S. transportation system has come to be dominated by petroleum-powered automobiles and trucks, especially for personal travel.

As part of this shift to motor vehicle travel, other significant changes have occurred. For example, in 1992 the Department of Transportation (DOT) issued a report on commuting, which indicated that from 1980 to 1990, the number of vehicles on the road grew 17.4 percent, almost twice as fast as the 9.7 percent increase in the number of workers. Commuting by transit declined slightly, and those working at home increased slightly.

Trends in highway travel and fuel consumption diverged in recent years. In 1990 highway travel in the United States totaled 2.2 billion vehicle miles, up 2.4 percent since 1989, while highway use of motor fuel was 131.6 billion gallons, a slight decrease from 1989. The shift is attributed in part to a steady rise in average fuel economy of all automobiles in use.

The most severe problem affecting America's highways is congestion. The Federal Highway Administration has reported that 65 percent of peak-hour travel on urban interstate highways was congested in 1987, up from 49 percent in 1981; on rural highways, that figure rose from 4 percent to 17 percent; and truck traffic alone increased by 44 percent. Traffic congestion, which wastes billions of dollars in lost time, money, and fuel, also is a major factor in causing smog.

The predominant mode for intercity freight is rail, followed by waterways, highway, pipeline, and air. U.S. freight railroads have substantial excess capacity and in the last decade have invested heavily in advanced technology to improve performance.

Railroads are more fuel efficient than trucks and barges and, even while carrying more total freight, emit far fewer air pollutants. And while all transportation modes pose serious risks from accidents involving hazardous materials, the accident rate of railroads has declined by about two-thirds and that of trucks by about one-third since 1980.

Oil tanker safety has improved markedly in recent years, possibly because of stricter federal and state rules adopted since the 1989 Exxon Valdez spill. According to a private study conducted for the Department of Energy, tankers in 1991 spilled 55,000 gallons of oil or petroleum products in U.S. waters, the lowest level in 14 years. The study found that no major spills occurred in the first six months of 1992 and that tanker operators were taking increased safety precautions.

Policies and Programs

In 1992 DOT worked to bring the U.S. transportation system into greater harmony with the environment, especially to reduce transportation's contribution to air pollution. Recent legislation, including the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), the 1990 Clean Air Act Amendments, and the Oil Pollution Act of 1990, contain numerous provisions that will change the way the nation moves people and goods.

Surface Transportation

The 1991 Intermodal Surface Transportation Efficiency Act established new sources of funding for environmental initiatives, increased flexibility in the major funding categories, and set more rigorous planning requirements. While ISTEA will result in large new investments in highway and transit programs, scarcity of land and traffic congestion suggest the need for emphasis on maximizing the efficiency of the system, not just expanding capacity.

Environmental Initiatives. ISTEA dedicated funds to congestion mitigation, air quality improvement, transportation enhancement, scenic byways, and recreational trails. It authorized \$809 million for the air quality program in fiscal 1992 and \$353 million for transportation enhancement, including historic preservation, nonmotorized transportation, scenic and water quality activities. DOT worked closely with CEQ, EPA, and the Department of Justice to set environmental priorities and to select environmental indicators and, in April 1992, issued guidelines for use of the new funding categories.

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America's Treeways: Planting Trees along Highways

As part of President Bush's America the Beautiful tree-planting initiative, a coalition of public and private organizations is planting thousands of trees along U.S. highways. Cosponsors include the DOT Federal Highway Administration, the USDA Forest Service, the DOI Take Pride in America program, the National Tree Trust (a private foundation), the National Association of State Foresters,

and state departments of transportation. The program relies on volunteers to plant and care for trees donated by forest product companies.

In 1992 volunteers planted 300,000 trees on highway rights-of-way in Ohio, and treeways are planned for Michigan and Virginia. Trees planted along U.S. highways benefit the environment in several ways:

- Enhancing visual beauty and roadside scenery;
- Creating habitats for wildlife and plants;
- Improving air quality;
- Reducing soil erosion by controlling water runoff; and
- Providing windbreaks and shade.

Planting trees promotes the spirit of volunteerism across the country, educates children about the environment, and builds partnerships among groups and individuals concerned with the preservation of nature.

Funding Flexibility. In the major infrastructure projects of the surface transportation program, ISTEA provided greater spending flexibility. Such flexibility promises environmental benefits, for example, during fiscal 1992 the act obligated \$243 million to mass transit projects from traditional highway revenue sources. This amount was in addition to \$3.8 billion available in fiscal 1992 transit funds.

Transportation Planning. In late 1992 DOT drafted funding provisions for transportation planning at the metropolitan and state levels. A stronger tie between transportation planning, land-use planning, and environmental planning will yield transportation projects that prevent or minimize such adverse environmental impacts as air and water pollution, habitat fragmentation, and disruption of communities.

In related efforts, the DOT Federal Highway Administration (FHWA) and the Environmental Protection Agency (EPA) signed a memorandum of understanding that provides a framework for enhanced coordination in 13 key environmental areas. The Clean Air Project of the National Association of Regional Councils, funded jointly by EPA and DOT, provided technical guidance to metropolitan planning organizations on clean air issues, including guidance on best modeling practices.

DOT also continued efforts to streamline processing of wetlands dredge and fill permits for transportation projects. DOT, the Army Corps of Engineers, and EPA signed a joint memorandum to field staffs aimed at improving coordination on transportation projects involving complex wetlands issues.

Intermodalism. The degree to which the various parts of a transportation system, such as highways, airports, and railroads, work together in a harmonious whole is called intermodalism. This concept is one of the factors that determines the effectiveness and efficiency of the nation's transportation system. In response to ISTEA, the Department of Transportation formed an Office of Intermodalism to maintain and distribute intermodal transportation data, coordinate federal research on the subject, and oversee grants to states to develop model transportation plans.

Auto Fuel Efficiency. In 1992 the costs and benefits of proposed major increases in corporate average fuel economy (CAFE)

standards were debated in Congress during deliberations on national energy legislation and in the 1992 presidential campaign. Some lawmakers proposed increasing the CAFE standard for passenger cars from the present 27.5 miles per gallon to 40 miles per gallon by the year 2000; presidential candidate Bill Clinton proposed reaching 45 miles per gallon by 2010.

In response to a request by DOT, the National Academy of Sciences published a report in April 1992 addressing potential fuel economy levels for new cars and light trucks through model year 2006. The study identified several technologies that would lead to improved fuel economy but also noted other factors that should be considered:

- Tighter tailpipe emission standards mandated by the 1990 Clean Air Act Amendments;
- Consumer preferences for larger vehicles, especially among senior citizens and farmers;
- Potentially increased costs per vehicle; and
- Impacts on employment and international competitiveness.

Bicycling and Walking

Bicycling and walking are two environmentally benign, low-cost, healthy ways to get around. In 1993 DOT will submit a National Bicycling and Walking Study to the Congress, outlining how federal, state, and local governments, private organizations,

and individuals can work together to increase bicycling and walking. The report includes new data on bicycling and walking and examines such issues as safety and health benefits.

Railroads

The efficiency of rail transportation suggests it may gain increased prominence in the transportation debates of the 1990s. In recent years, in addition to passage of ISTEA, the primary issues affecting railroads and the environment have involved advanced technologies and wetlands protection.

High Speed Rail. Magnetically levitated (maglev) trains are an energy-efficient, high-speed mode of ground transportation. In 1990 the DOT Federal Railroad Administration (FRA) formed the interagency National Maglev Initiative in cooperation with the U.S. Army Corps of Engineers, the Department of Energy, and EPA. The National Maglev Initiative is working with the private sector and state governments to assess the potential of these high speed trains. The goal is to improve intercity transportation in the twenty-first century through development of a commercially viable maglev system. Further research will determine the technological, economic, environmental, and safety issues associated with maglev, as well as its potential role in the United States.

The first commercial maglev system in the world is being planned in the Orlando, Florida, area. The DOT Federal Highway

Administration, DOT Federal Railroad Administration, and the Florida Department of Transportation jointly are preparing an environmental assessment for this project, the first assessment of its kind. FRA and the Texas High Speed Rail Authority are preparing an environmental impact statement on proposed high-speed rail projects between Dallas/Ft. Worth and Houston, and between Dallas/Ft. Worth and San Antonio.

Historic Preservation. Restored railroad stations along Amtrak's Northeast Corridor in New Haven, Connecticut, and in Washington, D.C., received recognition as winners of the 1992 National Historic Preservation Awards for rehabilitation of public buildings. With FRA financial and technical assistance, the two stations were updated to meet current demands while preserving historic elements. The award is administered by the Advisory Council on Historic Preservation.

Wetlands Protection. In 1992, DOT became a partner in Coastal America, an intergovernmental initiative to enhance the coastal environment. In particular, DOT is participating in a project involving the EPA, Department of Commerce, Army Corps of Engineers, and the State of Connecticut to restore coastal marshes along the Amtrak railroad line. The project will take advantage of ISTEA provisions that allow federal-aid highway funds to be used to support wetlands conservation efforts. Other states may also use this expanded funding flexibility to establish wetlands conservation banks and wetlands conservation

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plans. For more information on Coastal America, see the Coasts and Oceans section.

Airport Noise

The Airport Noise and Capacity Act of 1990 set national aviation noise policy and provided for a transition to a quieter aircraft fleet. In September 1991 the DOT Federal Aviation Administration (FAA) issued rules to phase out noisier aircraft by December 31, 1999, using an interim compliance schedule. In 1992 FAA received the first set of annual compliance reports, which indicated that the percentage of Stage 2 airplanes in the national fleet fell below 50 percent for the first time. Implementation of other regulations required by the Airport Noise Act has also begun.

Hazardous Materials Transportation

The Hazardous Materials Transportation Uniform Safety Act of 1990 imposed standards for use by states and Native Americans in setting and enforcing routes for transportation of certain hazardous materials. In July 1992 the DOT Research and Special Programs Administration (RSPA) issued a rule establishing a national registration program for certain shippers and carriers of hazardous materials and a collection system to fund a national emergency response training and planning grant program. In addition to these standards, RSPA developed the following

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regulations to coordinate U.S. domestic requirements with various international agreements:

- **Packaging Standards.** Several rules issued in 1990 to conform with United Nations recommendations on hazardous materials packaging became effective in 1992. The U.N. recommendations provide performance-oriented standards that encourage innovation and facilitate international commerce.
- **Marine Pollutants.** In 1991 the U.S. Senate ratified Annex III of the International Convention for the Prevention of Pollution from Ships, which mandated changes in the list of materials identified as marine pollutants by the International Maritime Organization. Currently the DOT Research and Special Programs Administration is developing regulations to implement the treaty obligations.

Marine Transportation and Oil Pollution

The Oil Pollution Act of 1990 (OPA) strengthened the authority of the federal government to prevent oil spills in marine and freshwater environments. It provided for the cleanup of spills and compensation for public and private damages, without preempting states' rights of recovery. DOT administers the law in cooperation with EPA.

Pollution Response. DOT regulations proposed in 1992 would require tank vessels and marine transportation facilities to develop oil spill response plans to be in place by February 1993

and operating by August 1993. Vessels transporting oil and hazardous bulk cargo would be required to carry pollution discharge removal equipment. Response plans also would be required for other kinds of transportation facilities, such as pipelines, rails, and highways.

In response to OPA, the Coast Guard placed pollution response equipment in each of its 49 marine safety units located in ports throughout the United States and purchased enhanced response equipment for 19 sites.

As of September 1992 a new Coast Guard Atlantic Strike Team is fully operational for both oil and hazardous substance spill response. The National Strike Force Coordination Center in Elizabeth City, North Carolina, administers Atlantic, Gulf, and Pacific Strike teams. The center trains federal on-scene coordinators in pollution response and provides technical assistance, equipment, and other resources in the event of a spill.

Liability. In response to OPA, the Coast Guard created the National Pollution Funds Center in February 1991 to address funding, liability, and damage claims arising from discharges and threatened discharges of oil. In August 1992 DOT issued an interim rule establishing procedures for filing of claims for removal costs or damages resulting from the discharge of oil.

Double-Hull Tankers. Under OPA, new tank vessels operating in U.S. waters must be constructed with double hulls, and

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existing single-hull vessels must be phased out between 1995 and 2015. In August 1992 DOT issued an interim rule providing guidance on double-hull construction.

DOT sponsored a 1991 National Academy of Sciences study on alternative tank vessel design, which found the double hull to be an effective design and recommended further study of the mid-deck design. In addition, the Coast Guard has participated in efforts by the International Maritime Organization to evaluate alternatives to double-hull construction and is preparing a report on the subject to the Congress.

Nonregulatory Initiatives. States have considerable leeway under OPA in regulating the maritime industry, which often results in inconsistent federal and state requirements regarding pollution prevention, preparedness, liability, and response. To address this problem, the Coast Guard has begun a program to improve coordination with states and to seek a consistent marine environmental protection strategy. The Coast Guard will encourage and support regional initiatives that bring citizen groups and marine industry associations together to foster long-term environmental compliance.

WATER

Also see Agriculture, Coasts and Oceans, Wetlands, and related tables and figures in Part II.

U.S. streams and rivers, lakes and ponds, and groundwater aquifers supply water for homes and businesses, drinking, irrigation, thermoelectric power, fisheries, wildlife habitat, and recreation. Once managed as separate entities according to political boundaries, water resources increasingly are managed as interconnected, essential parts of large aquatic ecosystems.

Conditions and Trends

Water-related issues tend to fall into two categories--water quantity and water quality--for surface water and for groundwater.

Water Quantity

In 1992 the nation's freshwater potable water supply needs were met by withdrawals from rivers, streams, lakes, reservoirs, and groundwater aquifers. On a national scale, water quantity was ample, with renewable water supplies in the lower 48 states

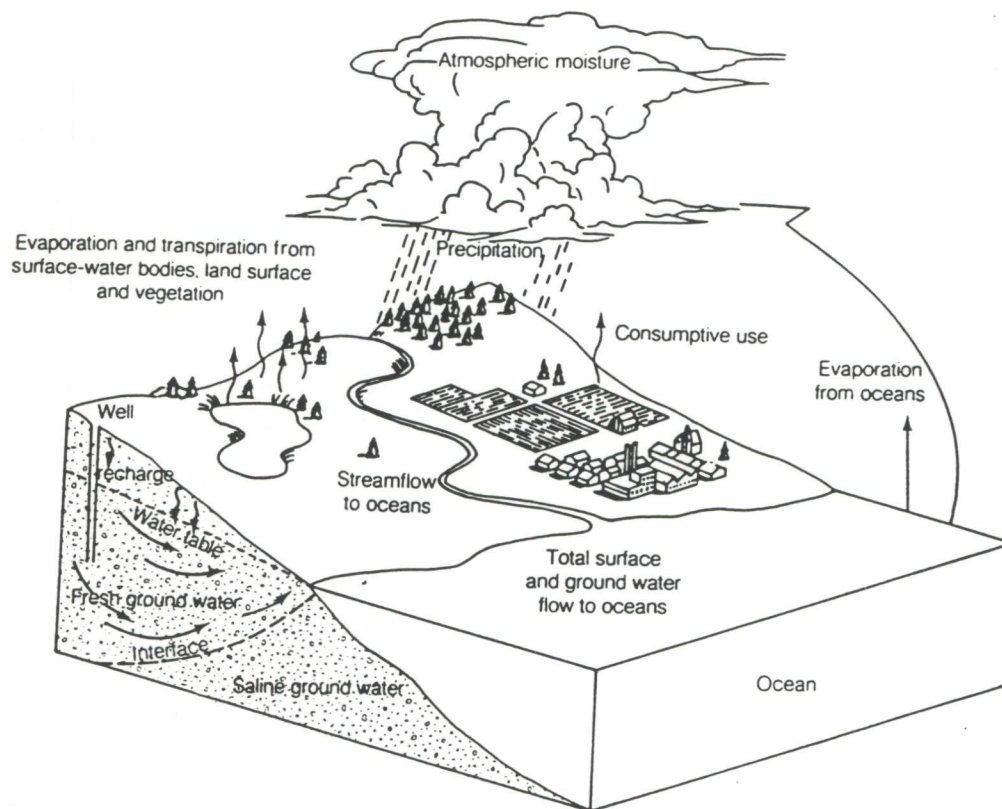
totaling 1.4 billion gallons per day in contrast to offstream withdrawals of 408,000 million gallons per day in 1990.

A different picture emerges, though, at the regional level because of an uneven natural distribution of the resource in relation to regional and seasonal water demand. Rising demands for limited supplies in certain parts of the nation, particularly the West, can cause public concern on a number of fronts--health, environmental, economic, recreational, and industrial. In some cases, changes in engineering, management, or public behavior can alleviate the concern.

The natural availability of water in any geographic area is determined by hydrologic conditions, which reflect the continual circulation of water from the sea to the atmosphere to the land and back again. The amount of rain and snow is the primary factor in the availability of surface water resources. Average annual precipitation in the United States is 30 inches per year; however, the range varies from a few tenths of an inch per year in the desert areas of the Southwest to 400 inches per year at some locations in Hawaii.

Surface Water. Streamflows are the standard measure of water quantity, whether in-stream or off-stream and whether for recreation, irrigation, or public water supplies.

- **National Water Conditions Report.** Six-year streamflow trend data (1986-1991) issued by the U.S. Geological



Hydrologic cycle

Survey for 12 hydrologic areas illustrates the variation in natural distribution of water supplies across the nation. Based on this data, 1991 monthly streamflow is above the long-term median in four basins, at the median in five basins, and below the median in three basins.

- **Augmenting Supplies.** The following methods can increase the efficiency of surface-water use for potable water supply:
 - Man-made surface-storage reservoirs,
 - Water conservation,
 - Improved water-system management,
 - Reuse of water of impaired quality or water recycling,
 - Reduction of evaporation from the soil, surface-water bodies, and plants, and
 - Greater utilization of groundwater aquifers through conjunctive use of groundwater and surface water.

Although surface-storage reservoirs can augment natural water supplies, their construction is limited by such factors as cost, competing land uses, engineering problems, and environmental concerns associated with land inundation and diversion or removal of water from downstream aquatic systems.

- **Users.** Currently, irrigation use accounts for the greatest share of fresh water withdrawals, at 40 percent, while industrial use accounts for 6 percent of that total. Thermoelectric powerplants use the greatest share of both fresh and saline withdrawals combined, at 48 percent. Because this water is used for cooling purposes, most of it is returned to the source. Nine states each withdraw greater than 10 billion gallons per day of surface water for combined offstream uses, constituting 42 percent of the total surface-water withdrawals in the country. The largest withdrawals occur in California, Illinois, New York, and Texas. Public water supply use continues to increase, reflecting population growth as well as an increase in per capita water use.

Groundwater. Although surface-water diversions continue to exceed groundwater pumping by volume, the nation has increased its use of groundwater for all purposes, except thermoelectric power generation. Groundwater provides drinking water supplies for 40-50% of the U.S. population. It also supplies 40 percent of average annual base flow to streams.

- **Use.** California, Idaho, Kansas, Nebraska, Texas, Florida, and Arizona--states where irrigated

agriculture is common--use the most groundwater. While groundwater is currently an alternative to surface-water supplies, particularly during drought, it may in the future become the preferred source for water.

• **Overuse.** In water-deficient areas, such as Arizona, large volumes of groundwater continue to be withdrawn to supply agricultural and municipal needs. Because of limited supplies, such withdrawals cannot be sustained indefinitely. In Florida, groundwater development has redistributed natural flow patterns in the aquifers, resulting in sinkholes, saltwater intrusion, and land surface subsidence. Groundwater mining in California's San Joaquin Valley has resulted in sediment compaction and land subsidence. Such development trends suggest the need to conserve existing groundwater supplies if the nation is to meet future water needs.

Floods and Droughts. Floods are natural and recurring hydrologic events, yet they remain one of the most destructive natural hazards in the United States. At the other extreme, droughts can severely reduce water availability and cause significant environmental and economic impacts. Adverse effects of a drought on water supplies depend on the amount of water stored or available from the preceding year, the water demands

relative to average flow, and the natural flow during a drought period. The multi-year droughts of the late 1920s and 1930s resulted in extensive regional impacts. For the past several years, numerous river basins in the western states have experienced drought conditions.

Water Quality

Despite decades of research and regulation, the federal government still lacks a comprehensive assessment of the quality of the nation's waters. Efforts to acquire this information come, in part, from the states, which every two years report to EPA, which in turn reports to Congress, on the water quality of their waters. These results are published in EPA's National Water Quality Inventory (the 305(b) report). According to EPA's 1990 National Water Quality Inventory, the states have assessed a third of total U.S. river miles, half of lake acres, and three-quarters of estuarine square miles, a substantial increase over those assessed for the previous water inventory made in 1988.

Of assessed water resources, two-thirds met federal water quality standards and achieved state-designated uses such as fishing, swimming, and drinking. One-third of the assessed waters do not meet their designated uses. Our major remaining problem causing this impairment is from wet weather runoff from such sources as farmlands and city streets, toxic pollutants,

groundwater contamination and loss of wetlands contributing to water quality problems.

Surface Water Impairment. The EPA 1990 National Water Quality Inventory indicates that agricultural sources are by far the leading source of contaminants, contributing 60 percent of impaired stream miles and 57 percent of impaired lake acres in the assessment. Sewage treatment plants followed agriculture as a contributor of stream contaminants, with 16 percent of impaired miles. Hydrologic/habitat modification contributed 40 percent of impaired lakes. Such impairments are not additive, since more than one source can contribute to impaired water quality.

Groundwater Impairment. For many years, land surface and subsurface disposal of wastes was considered safe and convenient. Only recently did researchers discover that natural processes have a limited capacity to convert contaminants into harmless substances before they reach groundwater. EPA considers a small portion of the nation's groundwater supply--between 1 and 2 percent--to be contaminated, but contamination can pose serious problems when it occurs in areas of high public use. Contaminants found in groundwater, such as organic and inorganic chemicals, radionuclides, and microorganisms, cause adverse health, social, environmental, and economic impacts. Social impacts include exposure to contaminants. Economic costs include expenditures on groundwater purification systems. Because

groundwater provides base flow to streams, the potential for adverse impacts on surface-water quality exists, especially under conditions where dilution is minimal.

Policies and Programs

Among the federal agencies with water-related responsibilities, the U.S. Geological Survey (USGS) in the Department of Interior (DOI) provides the hydrologic information needed to manage the nation's water resources. The Environmental Protection Agency (EPA) administers water pollution control and safe drinking water programs, assisted by the Army Corps of Engineers on issues such as wetlands and ocean dumping, and several DOI bureaus conduct water quality programs on public lands. The Army Corps of Engineers and the Bureau of Reclamation oversee a vast system of levees, dams, and reservoirs for flood control, irrigation, and other purposes. In addition, many states assume principal administrative roles in managing water resources through delegated programs.

Water Quantity

Although the federal government administers a significant portion of the nation's water storage and conveyance facilities, water allocation and administration rests principally with the states. The Army Corps of Engineers and the Bureau of

Reclamation provide federal assistance to the states for water quantity programs.

Drought Assistance. In 1992 the governors of California, Idaho, Nevada, Oregon, Utah, and Washington requested temporary drought assistance under the Reclamation States Emergency Drought Relief Act of 1991. The Bureau of Reclamation maintains Water Conservation and Advisory Centers in its regional offices and in its Washington, D.C., headquarters to coordinate water conservation programs with the states. In 1992 the Bureau took the following measures to lessen the impacts of the western drought:

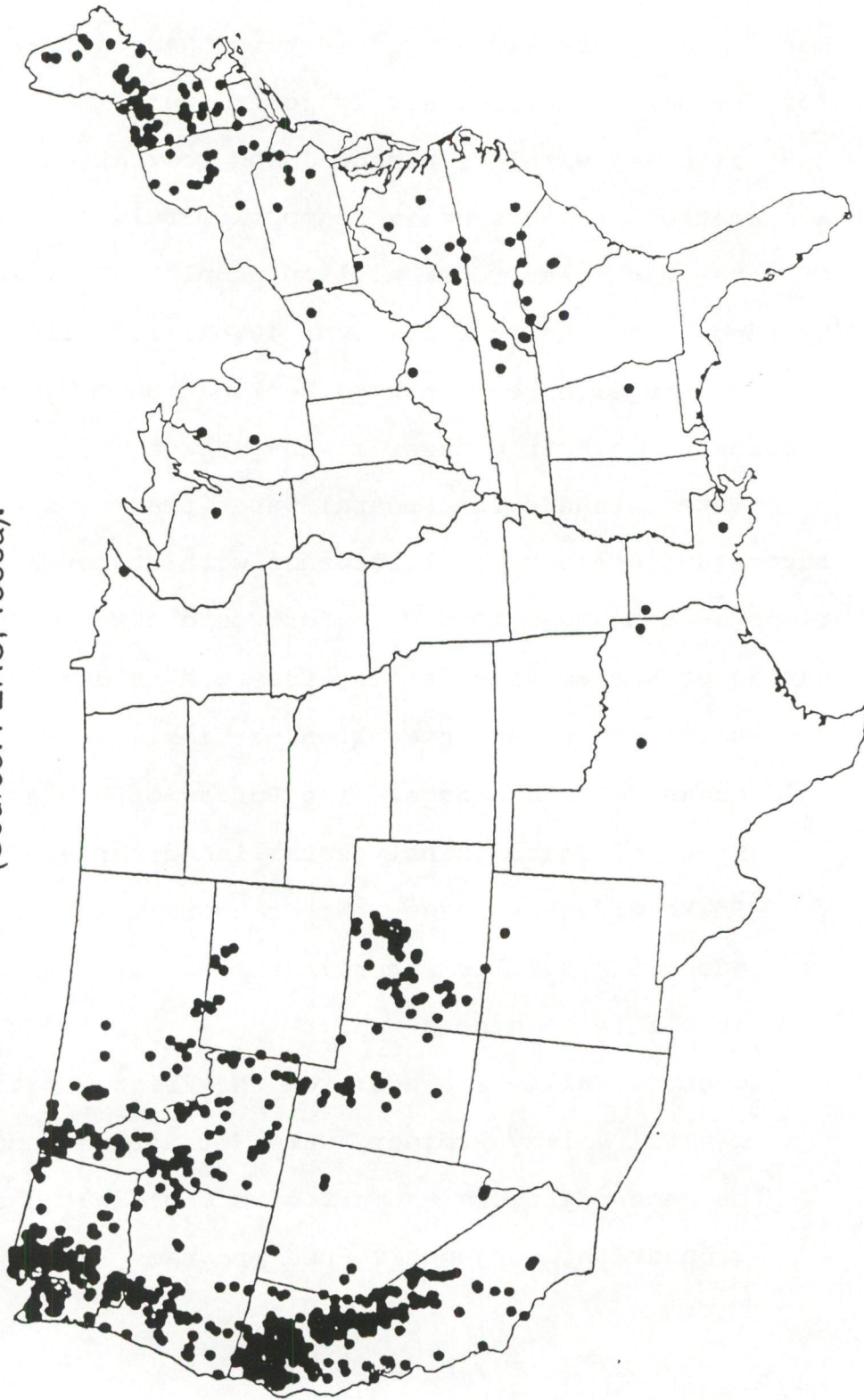
- Initiated seven studies requested by water districts to assess the potential to improve efficiency of water-delivery schedules,
- Facilitated water banking and transfers,
- Inventoried available water inactive in reservoir storage as a potential emergency water supply, and
- Identified studies needed on drought mitigation and water conservation to maintain crop production and protect the environment.
- Continued Global Climate Change Research Studies to evaluate probable impacts of drought on reservoir system management in the Western United States.

Water and Power. The Bureau of Reclamation is the federal agency that manages the majority of the water resources in the West. This water is stored in more than 350 reservoirs and used for irrigation, hydroelectric power, municipal and industrial use, fish and wildlife purposes and recreational uses. Reclamation projects deliver approximately 30 million acre-feet of water each year to 20 million people. Reclamation's 52 hydropower plants generate over 40 billion kilowatt hours of electricity each year, making Reclamation the eleventh largest producer of electric power in the nation.

Water Transfers. Federal water transfers among willing buyers and sellers, in accordance with state law, are one way to respond to changes in demand for western water supplies. The Bureau of Reclamation facilitates such trades in partnership with the states and other interested parties.

- **Snake River Drainage.** The Bureau of Reclamation and the State of Idaho jointly established three water banks in the Snake River Drainage. Water users with reservoir rights can "deposit" surplus water in the banks, thus making it available to others.
- **Central Valley Project.** On the Friant Unit of the Central Valley Project, water transfers occurred between districts as part of a coordinated surface and groundwater conjunctive-use program. Conjunctive use

Figure 2. Proposed Hydroelectric Projects That Would Require New Dams and Diversions
(Source: FERC, 1988a).



is the management of groundwater and surface water for one common purpose. Southern California water users are proposing to expand the conjunctive use of Central Valley Project water. Additionally, studies are underway to further enhance water-use efficiency in the Central Valley Project.

- **Columbia River Basin.** The Bureau of Reclamation traded flood-control storage space with the Army Corps of Engineers to aid salmon migration.

Indian Water Rights. In June 1989 President Bush stated that the federal government prefers to negotiate settlements of disputes over Indian water rights rather than litigate them. In fiscal 1991 Congress approved four such settlements. As an example, in the Fort McDowell Tribe settlement in Arizona, the Tribe received water supplies for agricultural, municipal, and industrial development as well as the opportunity to lease water supplies until needed. Local and state entities contributed funding, water, reservoir storage space, and water conveyance through canals, and the federal government contributed funding and water from the Central Arizona Project.

Water Quality

The goals of the Clean Water Act are ambitious--fishable, swimmable rivers throughout the nation and zero discharge of pollutants into U.S. waters. The act requires all municipal sewage and industrial wastewater to be treated to reduce or remove pollutants before being discharged into waterways, and it provides federal grants and capitalization of state revolving loan funds to help communities build sewage treatment plants. EPA, in cooperation with the states, establishes limits on the amounts of specific pollutants that may be discharged by municipal sewage treatment plants and industrial facilities, based on available technologies and economic costs of compliance.

National Pollution Discharge Elimination System. Under the Clean Water Act, EPA or approved states administer the National Pollutant Discharge Elimination System (NPDES) program. EPA or approved states issue permits that establish effluent limits for all municipal and industrial dischargers. The federal government currently authorizes 38 states and one territory to operate the NPDES permit program. In addition to technology-based limits, EPA may develop limits based on water quality criteria where technology-based controls are not stringent enough to make waters safe for such uses as fishing, swimming, and drinking. For industrial dischargers, EPA has established stringent standards to control up to 126 toxic pollutants. In 1992 about 50

industries complied with these standards, which are based on the best available technology that is economically achievable.

EMAP. The U.S. EPA is developing a new monitoring program, the Environmental Monitoring and Assessment Program (EMAP), to monitor and assess the ecological health of major ecosystems, including surface waters, forests, near-coastal waters, wetlands, agricultural lands, arid lands, and the Great Lakes, in an integrated, systematic manner. The program is designed to operate at regional and national scales, for decades, and to evaluate the extent and condition of entire ecological resources. A four-year resampling cycle will allow approximately 800 lakes and 800 stream sites to be evaluated annually.

Improving Water Quality in New York Reservoirs. In July 1992, New York City officials and 400 farmers in the Catskill Mountains and lower Hudson Valley agreed to voluntary measures designed to reduce water pollution from agricultural practices that could, if successful, save the City from spending the \$4 billion necessary to build a filtration system to keep the water clean. The city's six Catskill and Delaware River reservoirs, which provide drinking water to more than eight million people, are reportedly being contaminated by manure, insecticides, fertilizers, and road runoff commonly found in farming areas.

Under the agreement, the city will pay \$3.4 million to the state's Soil Conservation Committee, that will in turn provide

technical assistance to the farmers through Cornell University and other state and local agricultural and environmental groups. Spokesmen for the farmers reportedly believe that as much as 80% compliance with water quality requirements can be achieved through successful implementation of these voluntary measures.

Groundwater Quality Protection. To protect groundwater, EPA is implementing its Ground Water Strategy for the 1990s. The strategy emphasizes pollution prevention and draws upon federal environmental laws that control solid and hazardous wastes, pesticides, surface waters, underground storage tanks, and waste cleanup, as well as drinking water. As part of a new initiative, the Comprehensive State Ground Water Protection Program, states are beginning to integrate all federal and state programs that relate to groundwater. EPA provided \$12.2 million to the states to implement the program.

Safe Drinking Water Program. EPA sets standards for drinking water quality and requirements for treatment under the federal Safe Drinking Water Act (SDWA). There are now 84 standards established to control both manmade and naturally occurring contaminants. Through the SDWA authorized Public Water Supply Supervision program, all systems must comply with these standards and treatment requirements. In most cases, states have the primary responsibility for oversight and enforcement. EPA

supports states through grants and technical assistance and, if necessary, enforces SDWA regulations.

National Water Quality Assessment. The U.S. Geological Survey administers the National Water Quality Assessment Program (NAWQA) to describe the status and trends in the quality of the nation's surface waters and groundwater. Over a period of 10 years, NAWQA will conduct investigations in 60 study units to study 70 percent of the water Americans use along with the populations served by public water supplies. Personnel will use physical, chemical, and biological measures to investigate the occurrence of pesticides, nutrients, and sediments. Full implementation of NAWQA began in 1992, and the Geological Survey has field investigations underway in 20 study units distributed across the nation. Study units consist of watersheds that range in size from 1,200 to 60,000 square miles. Each study unit has a liaison committee with representatives from federal, state, and local agencies, universities, and the private sector.

Endangered Species Protection. A third of all federally listed threatened and endangered species rely on aquatic ecosystems. In July 1992 EPA and the U.S. Fish and Wildlife Service signed a Memorandum of Understanding (MOU) linking Clean Water Act standards to species protection. EPA agreed to an assessment and consultative process to determine whether CWA standards interfere with provisions of the Endangered Species

Act. Where adverse impacts are found, EPA could move to alter CWA standards to mitigate impacts.

President's Water Quality Initiative. The U.S. Department of Agriculture has undertaken a major research initiative--the Management System Evaluation Areas (MSEA). The emphasis of this program is on nonpoint-source contamination of ground and surface water by agricultural chemicals. Research results from five study locations in the Midwest will help farmers control and reduce the impact of agrichemicals on water resources. USGS is supporting the initiative by conducting geohydrologic studies and research on the fate and transport into groundwater of atrazine, carbofuran, alachlor, and nitrate.

National Irrigation Water Quality. The Department of the Interior administers this program to investigate irrigation-induced water quality problems in the western states. Reconnaissance investigations check for contamination by trace elements and toxic substances including selenium, mercury, arsenic, and pesticides. In 1992 DOI completed 10 investigations, during which waterfowl deformities and reproductive problems were found at several locations. The Department has published detailed study reports for the Kendrick Reclamation Area in Wyoming, and the Stillwater Wildlife Management Area in Nevada.

Nonpoint Source Pollution. Despite progress in improving water quality impacts from industrial and municipal dischargers (point sources), the nation faces significant water quality challenges. Our major remaining water pollution problems are from less obvious sources of pollution that are more widespread, i.e., non-point sources that affect both surface and ground water resources. These less obvious sources are now believed to contribute more to water quality degradation than point sources. Leading non-point sources of pollution include: agricultural; urban runoff; forestry; and hydromodification. In 1992 EPA awarded 52.5 million to the states to assist in the development of non-point management programs. In addition, a 1991 survey by the National Association of State Foresters indicated that 32 states have forestry nonpoint source pollution control programs, which emphasize prevention through the use of best management practices (BMPs), and 18 states are conducting BMP compliance surveys. Compliance in 1991 ranged from 79 percent for streamside management to 98 percent for forest-site preparation.

Combined Sewer Overflow Initiative. Combined sewer overflows (CSOs) occur where sanitary and storm sewers are interconnected. During rainstorms, these systems become overloaded, bypass treatment works, and discharge as much as 90 percent of the pollutants they contain. CSO discharges may contain high levels of suspended solids, bacteria, heavy metals,

floatables, nutrients, oxygen-demanding organic compounds, oil and grease and other pollutants. Discharges of these pollutants can cause exceedances of state water quality standards. In 1989, EPA issued the National Combined Sewer Overflow Strategy. The Strategy reaffirmed that CSOs are point sources subject to NPDES permit requirements, including both technology-based and water-quality-based requirements of the Clean Water Act. In 1991, EPA launched an initiative targeting those CSO systems causing the most severe water quality problems. EPA will issue new or revised permits to CSO systems lacking or having inadequate discharge permits, and plans enforcement actions against systems in violation of permit limits.

Mexican Border Initiative. In February 1992 the United States and Mexico adopted a multi-media plan to address environmental problems along their common border. The plan includes construction of international wastewater treatment facilities, provision of safe drinking water, conducting joint monitoring and enforcement, and providing technical assistance and training to Mexico. Technical assistance and training have begun, joint monitoring is planned in 1993 along the Rio Grande River, and monitoring of ground water is proposed for the Nogales and El Paso areas. Construction and design for the Tijuana international wastewater facility have continued, while international agreements are being negotiated for wastewater

facilities to serve Nogales and the area of Mexicali/Calexico. In 1993 numerous U.S. agencies will coordinate to provide over \$85 million in grants and loans to poor Mexican communities or colonias across the border from Texas and New Mexico.

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Geographic Targeting: Watershed Management

Geographic targeting focuses not on political boundaries, such as federal regions, states, counties, or municipalities, but on ecological units--estuaries, river basins, corridors, or the critical habitat of a species or group of species. Watershed management is an example of this approach.

In April 1991 EPA identified watershed management as a tool for dealing with problems affecting watersheds selected for special attention.

Watershed management honors the interconnectedness of aquatic systems by managing human impact on those systems in an integrated fashion. The objective is to align existing water quality management programs to complement and strengthen the efforts of others, including other federal agencies, state and local governments, and private citizens. This approach shifts the emphasis from particular pollutants or pollution sources to a process that begins with the questions, "What is affecting this watershed? Can the resource and its stressors be managed differently?"

In 1992 EPA was involved in watershed projects in the following locations:

- Anacostia River, Maryland and the District of Columbia;
- Bear Creek Floatway, Alabama;
- Canaan Valley, West Virginia;
- Elkhorn Slough, California;
- Merrimack River, Massachusetts and New Hampshire;
- Pequea and Mill Creeks, Pennsylvania; and
- Tomki River, California.

WETLANDS

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

Wetlands are critical ecological systems. An estimated 80 percent of the nation's coastal fisheries and one-third of the nation's endangered species depend on wetlands for spawning, nursery areas, and food sources. Wetlands are home to millions of waterfowl, other birds, plants, mammals, and reptiles. Wetlands also perform hydrologic functions. Serving as recharge areas, they help protect the quantity and quality of the nation's groundwater. Unaltered wetlands in a flood plain can reduce flood peaks by 80 percent, and their natural water filtration and sediment control capabilities help maintain water quality.

Wetlands are also vital to commercial and recreational sectors of the economy, such as the sports fishing and waterfowl hunting industries. In addition, the diversity of plant and animal life in wetlands make them a valuable resource for nonconsumptive fish and wildlife-related recreation. Wetlands provide educational and research opportunities and a variety of historical and archaeological values.

Conditions and Trends

More than half of the wetlands that existed in what is now the lower 48 states have been converted to other uses; several states have lost 80 percent or more of their wetlands. Estimated annual wetlands losses between the mid-1950s and the mid-1970s stand at 458,000 acres, with another 290,000 acres lost per year between the mid-1970s and the mid-1980s. Loss estimates for non-federal rural areas in the 1982-1991 period were lower.

Loss figures can be confusing, since they may include as "converted" areas that still exhibit wetlands characteristics, particularly in agricultural areas. For the purposes of inventory, federal agencies consider lands cleared of native wetlands vegetation as converted to other uses and often do not count them as wetlands. However, if upon discontinuation of cropping, these lands exhibit wetlands soil and hydrologic characteristics and support wetlands vegetation, they may be considered wetlands for regulatory purposes.

Policies and Programs

In 1992 the U.S. government continued efforts to restore wetlands and reform federal wetlands programs. Activities in the wetlands policy arena focused largely on implementing the President's August 1991 comprehensive policy statement on wetlands.

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Wetlands Restoration

Federal agencies restore wetlands on their own lands as well as providing technical and financial assistance to state and private landowners. A 1992 interagency report (described below under "Nonregulatory Programs") reports restoration and enhancement of 282,000 acres of federal wetlands from FY 1989 through FY 1992. A half million acres of wetlands on non-federal lands were also restored, primarily with federal technical assistance.

Agricultural Wetlands Reserve

The Agricultural Wetlands Reserve Program is a new, permanent easement program created by the 1990 Farm Bill. The program currently is authorized to purchase permanent wetlands easements on up to 1 million acres of farmland over five years, and to pay up to 75 percent of restoration costs. While budget requests for FY 1992 and FY 1993 were in line with the 1 million-acre target, Congress provided only \$46 million for a 50,000-acre pilot program in FY 1992, and no funding for FY 1993. During the sign-up period, private landowners attempted to enroll nearly 500,000 acres of wetlands in the 50,000-acre 9-state pilot program.

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Agricultural Wetlands Reserves

In the initial sign-up period for the new Agricultural Wetlands Reserves program, administered by the Department of Agriculture, U.S. farmers offered to set aside the following acreage in conservation easements:

<u>State</u>	<u>Acres offered</u>
California	85,000
Iowa	45,000
Louisiana	119,000
Minnesota	33,000
Missouri	29,000
Mississippi	115,000
New York	2,000
North Carolina	25,000
Wisconsin	13,000
Total	466,000

Conservation Reserve Program. Through the Conservation Reserve Program (CRP), which is primarily designed to protect highly erodible cropland, the Department of Agriculture protects wetlands through 10-year contracts and provides assistance for wetlands restoration efforts. To date, 400,000 acres of wetlands have been enrolled. Current CRP lands can be returned to active cropping after the expiration of the 10-year contract, or they could qualify for enrollment in the Agricultural Wetlands Reserve.

Bureau of Land Management. BLM is initiating a national strategy to restore wetlands-associated wildlife habitat on 20 million acres. For example, in Idaho, BLM worked with Ducks Unlimited and the Idaho Department of Fish and Game to construct 11 miles of fence to enhance waterfowl nesting and breeding habitat along the South Fork and Henry's Fork of the Snake River. The Thousand Spring/Chilly Slough area was selected by the North American Wetlands Conservation Council to receive a \$125,000 grant to acquire adjacent wetlands habitat, and The Nature Conservancy

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transferred to the State of Idaho 18 acres of headwater spring crucial to the management and protection of this key waterfowl habitat area.

North American Waterfowl Management Plan

The North American Waterfowl Management Plan provides an umbrella for activities of many federal agencies and for federal partnerships with other public and private groups. Partners include the governments of the United States, Canada, and Mexico, 50 states, 10 provinces, and more than 250 conservation groups. Between 1986 and 1991, more than 250 wetlands conservation partnerships have implemented habitat protection, restoration and enhancement projects benefiting over one million acres of wetlands and associated habitats. Accomplishments for 1992 are expected to include 60,000 acres restored, 140,000 acres enhanced, and 210,000 acres protected.

Private Lands Restoration

The Fish and Wildlife Service provides technical and financial assistance to private landowners, through its Partners for Wildlife program. Working with private partners, FWS has helped restore roughly 177,000 acres through voluntary agreements with about 9,000 landowners. In 1992, FWS helped restore about 37,400 acres through voluntary agreements with 2000 landowners.

Riparian Areas

Riparian areas--lands directly influenced by permanent water --include lakeshores and streambanks. The values and benefits of these areas far exceed the relatively small acreage they occupy. In the arid western United States, riparian areas are among the most productive ecosystems on public lands. They contribute to biodiversity by, among otehr things, providing critical habitat for fish and wildlife, and migratory routes for birds, as well as shelter and forage for livestock. Healthy, functioning riparian areas yield vegetation that acts to stabilize streambanks, thus minimizing erosion and reducing flood damage. Together with wetlands, riparian areas provide quality water for downstream users, recharge groundwater, and produce timber and forage. Many riparian areas on public lands have deteriorated over the years. Since their benefits can not be fully realized under degraded conditions, there is growing public concern about the condition of riparian areas, particularly in the western states.

USDA Forest Service. The National Forest System contains 5.6 million acres of riparian ecosystems along 359,000 miles of streams, rivers, and shorelines. In 1990 only 42 percent of these riparian areas met forest plan standards. Based on inventories of over 400,000 acres of riparian ecosystems, the Forest Service developed a number of restoration plans for the future. The goal of the agency's Riparian Strategy is to complete forest-wide inventories of riparian conditions and ecological health by the

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year 1995. In 1991, the Forest Service issued "Riparian Management, A Leadership Challenge," to restore riparian areas and wetlands throughout the National Forest System and to assure that healthy riparian areas are not degraded by human activities. The Forest Service goal is to meet National Forest Plan Standards on 75 percent of unsatisfactory riparian areas by the year 2000.

Over the past three years, the Forest Service has restored 22,000 acres of riparian areas on the Lassen, Plumas, Six Rivers, Cleveland, and Mendocino forests in the Southwest. Assisting with meadow rehabilitation, channel and bank stabilization, road obliteration, mine rehabilitation, and gully restoration are the following groups: California Department of Fish and Game, California Department of Forestry, California Conservation Corps, Youth Conservation Corps, Los Angeles County Parks and Recreation Department, local landowners, and national forest permit holders.

Bureau of Land Management. Riparian areas constitute 23.7 million acres or 8.8 percent of the 270 million acres of BLM lands. In an effort to restore, enhance, and protect these areas, BLM has undertaken a Riparian-Wetlands Initiative for the 1990s. With a goal of restoring 75 percent of BLM riparian areas by 1997, BLM has implemented 680 new on-site projects, such as constructing fences to improve grazing management and 530 maintenance projects to upgrade deteriorated fences, water developments, and habitat improvement structures and to plant trees and use prescribed fire. The Bureau is conducting inventories on thousands of miles of

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riparian streams to determine their condition and potential for recovery. Examples of cooperative efforts follow.

- **Marys River.** Ranchers, local people, and conservation groups have working together to improve riparian management on the Marys River in Nevada. As a part of this effort, 54 miles of stream critical to the threatened Lahontan cutthroat trout was acquired through a land exchange between BLM and private owners.
- **Trout Creek.** The Trout Creek area of Southeast Oregon is a 190,000-acre watershed with about 175 miles of stream. Due to poor livestock management practices, much of the watershed was in degraded condition. BLM, local ranchers, Oregon Trout, the Oregon Environmental Council, the Izaak Walton League of America, and others developed a rotational grazing system to give the degraded areas periodic rest from the grazing of 2,000 head of cattle.
- **Cedar Creek.** Cedar Creek in Northern California is an 8 1/2 mile stream on private land surrounded by a 60,000-acre watershed managed primarily by BLM. BLM, landowners and ranchers, the Alturas Riparian Steering Committee, The Nature Conservancy, and others are cooperating to protect and enhance upland and riparian-wetland areas. Techniques include improved grazing management, prescribed burning to control sagebrush and juniper, and planting of willows, cottonwoods, aspen, and sedges. [GRAPHIC ON RIPARIAN AREAS]

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Coastal America Saltmarsh Restoration

The Intermodal Surface Transportation Efficiency Act (ISTEA) allows federal-aid highway funds to be used for wetlands mitigation and conservation. In July 1992 the interagency Coastal America partnership signed agreements to restore ecologically valuable saltmarshes along the Connecticut coastline. These marshes have been cut off from tidal flow since rail and road corridors were developed along the coastline in the early 20th century. The partnership involves the Connecticut departments of Transportation and Environmental Protection, the U.S. Environmental Protection Agency, and the federal departments of Transportation, Commerce, and the Army. The agencies agreed to identify appropriate candidate sites and cooperate on restoration activities. For more information on Coastal America, see the Coasts and Oceans section.

Aquatic Ecosystems Restoration Strategy

A committee of the National Research Council (NRC) recommended in 1992 that a national aquatic ecosystems restoration strategy be developed for the nation, in order, over the next 20 years, to accomplish restoration of the following:

- 2 million acres of lakes,
- 400,000 miles of river-riparian systems, and
- 10 million acres of wetlands, largely through reconvertng crop and pastureland and modifying or removing water-control structures. The committee recommended this as a "net gain"--

that is, 10 million acres over and above losses of wetlands from other activities.

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Wetlands Acquisitions

In 1992 federal acquisitions of key wetlands continued under a variety of programs. Federal agencies purchased a total of 132,939 acres using various funding sources led by the Land and Water Conservation Fund for 49,196 acres and the Migratory Bird Conservation Fund for 83,746 acres. Examples of wetlands acquisitions follow.

<u>Agency</u>	<u>Project</u>	<u>Location</u>	<u>Acreage</u>
NOAA (1)	ACE Basin NERR (2)	North Carolina	3,408
NOAA	North Carolina NERR	North Carolina	45
NOAA	Sapelo Island NERR	Georgia	206
FWS(3)	Morgan Brake NWR(4)	Mississippi	3,897
FWS	Grasslands WMA	California	6,129
FWS	Deep Fork NWR	Oklahoma	6,805
FWS	Bogue Chitto NWR	Louisiana	2,476
FWS	Waterfowl Production Areas	North Central United States	63,159

- (1) National Oceanic and Atmospheric Administration; U.S. Department of Commerce
 - (2) National Estuarine Research Reserve
 - (3) Fish and Wildlife Service; U.S. Department of the Interior
 - (4) National Wildlife Refuge
 - (5) Wildlife Management Area
-

Coastal Wetlands Conservation

The Coastal Wetlands Planning, Protection, and Restoration Act of 1990 created a National Coastal Wetlands Conservation Grants Program for state coastal conservation efforts. A total of 13 projects received \$5.7 million in federal funding in 1992.

The President's Wetlands Plan

The President's August 1991 comprehensive policy statement on wetlands had the following major elements:

- Develop a new federal wetlands delineation manual,
- Strengthen nonregulatory programs, and
- Reform the Clean Water Act section 404 regulatory program.

Wetlands Delineation Manual. EPA and the departments of Agriculture, Army, and Interior continued work on revisions to the 1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands. Prior to 1989, there was no common federal agencies delineation method; some agencies used different techniques in different areas of the country. For example, the 1987 Corps Manual was not binding upon Corps staff conducting delineations, so its use was inconsistent. An interagency manual prepared in 1989 became the subject of intense controversy and led, in August 1991, to a proposed revision of the 1989 manual. The agencies received over 76,000 comments from the public in response to the proposal. At this writing, these comments and options for proceeding are being considered. In the meantime, the Army Corps of Engineers has returned to use of a 1987 Corps manual, which had been applied widely with acceptable results in the field, for implementation of the Section 404 regulatory program. USDA continues to rely upon the National Food Security Act Manual to implement Swampbuster and the

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other wetlands provisions of the 1985 and 1990 Farm Bills.

Nonregulatory Programs. The President's policy statement included elements to strengthen acquisition and other nonregulatory programs that protect wetlands, in many cases through better coordination of existing programs.

- **National Restoration Program.** The 1991 policy statement called for a government-wide wetlands restoration and creation program on federal lands. The Interagency Committee on Wetlands Restoration and Creation, created to fulfill this mandate, completed its report - "A National Program For Wetlands Restoration and Creation" in August 1992. The report recommended long- and short-term objectives, consistent with the recent National Research Council (NRC) report on restoration of aquatic ecosystems. The interagency committee provided criteria for project selection and made the following recommendations:

- Restoration on 1.3 million acres by 1995 (200,000 acres of federal and 1.1 million acres of non-federal lands) to achieve a net gain of 10 million acres of wetlands on federal and non-federal land by 2010.
- Voluntary federally assisted measures on non-federal lands, since approximately 90 percent of restorable wetlands are on state and private lands;
- Initial focus on wetlands restoration rather than

creation, since restoration has a higher likelihood of success;

- Uniform definitions and reporting standards; and
- A limited-term Federal-state-private National Wetlands Restoration Council to coordinate restoration, enhancement and creation activities. The NRC report also recommended a single coordinating entity.
- **Inventory.** Many federal programs collect information on wetlands. The objectives of the following inventory programs are to ensure that such efforts are efficient and results comparable.
 - A long-term effort is underway to assess the feasibility of coordinating and integrating the U.S. Fish and Wildlife Service National Wetlands Inventory, which is national in scope, with the USDA National Resources Inventory, which focuses on resources in addition to wetlands, uses different methods, and covers only rural, non-federal lands only.
 - A recommendation to update and distribute a report on Federal coastal wetlands mapping programs prepared by the Fish and Wildlife Service and the National Oceanic and Atmospheric Administration was made in 1992 by the interagency Federal Geographic Data Committee. The report describes Federal activities, including purpose, technologies used, and products.

- An agreement to use a common wetlands classification/identification scheme (the Cowardin system) to provide consistency in describing wetlands was reached in 1992 by federal agencies undertaking inventory efforts (USDA, DOI, NOAA and EPA).
- **Research.** The Federal Coordinating Committee on Science, Engineering, and Technology (FCCSET) established a Subcommittee on Wetlands Research to define wetlands research responsibilities, and to identify areas where future research could support program development and facilitate coordination in wetlands research. The subcommittee produced a comprehensive inventory of federal wetlands research efforts.

Regulatory Streamlining. The third element of the President's wetlands plan was to streamline the Clean Water Act's Section 404 regulatory program. The following were activities undertaken in 1992 in pursuit of this goal.

- **Project Management.** The Army Corps of Engineers issued a Regulatory Guidance Letter (RGL) clarifying its decision-making role for the evaluation of permits in the Section 404 program. The RGL is aimed at improving coordination between federal agencies and applicants in requesting information, providing comments, and negotiating permit conditions.
- **Permit Elevation.** In late summer 1992, the federal government revised interagency agreements involving the Army Corps of

Engineers, EPA, the Fish and Wildlife Service, and the National Marine Fisheries Service. These agreements, developed under section 404(q) of the Clean Water Act, allow for orderly resolution of disputes between the Corps, which issues section 404 permits, and the three principal review/resource agencies. Procedures governing elevation of permit decisions for higher level review are a principal component of the agreements. The revisions differ from past Section 404(q) interagency agreements by limiting elevation only to those permits affecting aquatic resources of national significance.

- **Regulation of Prior Converted Cropland.** The Army Corps of Engineers and EPA proposed regulations that would incorporate into Section 404 regulations existing Corps guidance providing that "prior converted" croplands are not within the scope of the Section 404 program. Prior converted croplands are areas that were converted (mostly through drainage) prior to the passage of Swampbuster in the 1985 farm bill.
- **Outreach and Public Information.** In an effort to clarify the Federal wetlands program and improve communication with the agriculture community, the Department of Agriculture, EPA and the Corps of Engineers developed six "fact sheets" on various issues relating to wetlands and agriculture. Additional materials such as brochures are being developed. In an effort to increase private stewardship of wetlands, EPA's Wetlands Hotline (1-800-832-7828), which distributes the fact sheets

described above, as well as other materials, is being expanded to include information on voluntary public and private assistance programs available to private landowners.

- **Transportation and the Section 404 Program.** The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) will provide billions of dollars for improvements to the nation's transportation infrastructure. To ensure that these projects receive appropriate, expeditious environmental review, the Secretary of Transportation, the EPA Administrator, and the Assistant Secretary of the Army for Civil Works signed a joint memorandum to senior regional managers for each agency emphasizing the need for improved coordination, innovative and cost-effective approaches, and to the extent practical, integration of section 404 alternative analyses with those conducted under the National Environmental Policy Act. The memo included 13 specific action items or commitments and provided headquarters contacts to resolve issues that cannot be addressed quickly in the field.
- **Alaskan Wetlands.** In late October 1992, the Administration proposed a rule change that would remove the requirement that Section 404 permits in Alaska be subject to review using the process known as "sequencing." Sequencing requires applicants to avoid negative impacts; or if that is not practicable, to minimize such impacts; finally, if that is not practicable, to compensate for such impacts with mitigation measures,

usually restoration or creation of wetlands -- preferably on or near the site. In its place, applicants would be required only to demonstrate that they had minimized impacts. In proposing the rule, EPA requested comments on approaches -- including retention of sequencing -- for protecting high-valued wetlands in Alaska.

file 22

THE WHITE HOUSE
WASHINGTON

December 23, 1991

MEMORANDUM FOR MICHAEL BOSKIN

FROM: ALLAN BROMLEY *Alan*
SUBJECT: Chapter Five of the 1992 Economic Report

In general, an excellent piece of work as always. Herein the few minor comments.

1. Page 94, second and third sentence. While I agree entirely, many may feel that this estimate is an extreme one.
2. Page 94, end of first paragraph. I would suggest that you include reference here to the budget numbers for R&D on energy efficient technologies.
3. Page 53, line 3. Suggest that this be changed to read as follows:
"chlorofluorocarbons (CFCs) probably have no net effect on global surface temperature and raised a number of new scientific questions regarding the nature of chemical reactions in the atmosphere including several important gases." CFCs are indeed still greenhouse gases. It is the chemical reactions between them and ozone and nitrous oxide -- among others -- that is at issue.
4. Page 52, penultimate line. Suggest that this should read: "The question of how much several of the gases contribute to the greenhouse effect also remains uncertain; this is -----."

cc: Phil Brady

CLOSE HOLD

Document No.

294320

WHITE HOUSE STAFFING MEMORANDUM

DATE. 01/17/92 ACTION/CONCURRENCE COMMENT DUE BY C.O.B. Tuesday 01/21
SECOND DRAFT
1992 ECONOMIC REPORT OF THE PRESIDENT, Chapter 5 --
SUBJECT: COMPETITIVE FORCES AND REGULATION

	ACTION	FYI		ACTION	FYI
VICE PRESIDENT	☐	☒	HORNER	☒	☐
SKINNER	☐	☒	MCCLURE	☒	☐
SCOWCROFT	☒	☐	PETERSMEYER	☐	☐
DARMAN	☒	☐	PORTER	☒	☐
BRADY	☐	☒	ROGICH	☐	☐
BROMLEY	☒	☐	SMITH	☐	☐
CARD	☐	☒	<u>BROADMAN, Harry</u>	☐	☒
DEMAREST	☒	☐	<u>DELAND</u>	☒	☐
FITZWATER	☐	☒		☐	☐
GRAY	☒	☐		☐	☐
HOLIDAY	☒	☐		☐	☐

REMARKS:

Please provide any comments directly to Harry Broadman, Rm. 314 by COB on Tuesday, 1/21, with a copy to this office. Thanks.

RESPONSE:

CLOSE HOLD

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shortcomings of the CAFE program serve as a reminder of the dangers of an ill-designed regulatory program. A successful regulatory program must first define the externality it intends to address, then design incentives to address these externalities, without introducing any new ones.

Global Climate Change

Global climate change is another example of an environmental externality. The presence of "greenhouse gases" such as carbon dioxide, methane, and water vapor in the atmosphere helps to maintain surface temperatures at historic levels. If these gases were wholly absent, the temperature of the earth would be about 33°C lower. These gases retain and reflect some of the heat given off by the earth back to its surface, providing a sort of blanket over the planet. Some production processes such as the burning of fossil fuels result in the emission of greenhouse gases. These additions to the earth's natural supply of such gases have raised concerns over possible effects on global climate. Those who emit greenhouse gases do not account in their production decision for the climatic effects they may cause. A negative externality is present if these emissions cause harmful ecological and economic effects.

As with many global environmental issues, much of the research regarding the effects of greenhouse gases is in its preliminary stage. Indeed, the Intergovernmental Panel on Climate Change, under the aegis of the United Nations, estimated that it may take a decade or more to ascertain whether human-induced climate change has indeed occurred. The question of which gases contribute significantly to the greenhouse effect also remains open. This point is illustrated by the conclusion of the Scientific Assessment of Stratospheric Ozone, a recent study, which stated that chlorofluorocarbons (CFCs), though they have ozone depletion features, probably have no net effect on global temperature, reversing the previously accepted conclusion.

Most scientists agree that some warming will occur as a result of fuel burning, deforestation, and other human activities. At issue is timing and magnitude. Atmospheric CO₂ is expected by most estimates to double from preindustrial levels by about the middle of the 21st century. The increase in global average temperature that will result from this doubling has been estimated at between 1.5°C and 4.5°C, with the most recent estimates falling in the lower end of this range. The negative effects of a warming of this magnitude could include an increase in sea level, changes in precipitation patterns, an increase in storms in certain areas, changes in forest and crop land, and threats to certain species.

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Recent scientific research generally discounts the severe effects predicted in some preliminary work a few years ago.

From an economic perspective, the following questions must be addressed: First, do greenhouse gas emissions from human activities constitute a significant externality? Second, if so, is it negative (such as an increase in sea level), positive (such as a longer growing season in Canada and the former Soviet Union), or both (a mix of impacts that benefits some regions and harms others)? The scientific consensus is by no means clear on this point. If a negative externality is determined to exist, the next step is to identify the major sources, from natural as well as human activities, of all greenhouse gases and to determine their relative contributions to potential warming. At the same time, carbon-absorbing material (sinks), such as forests should also be identified. Next, one must determine if it is better to reduce emissions now, perhaps using economic incentives, or to wait and respond later to the observed effects.

In choosing among alternative courses of action, the scientific uncertainty surrounding climate change should be considered along with estimated costs and benefits of action. A prudent course includes taking those actions that would be desirable on their own merits, while deferring costly steps that should properly await resolution of key scientific uncertainties. Rational policy requires balancing the costs of delay with the benefits of information that will be available later.

The potential effects of climate change are generally long term, and the initial costs of proposed remedies may be high. One proposal aims to stabilize global greenhouse gas emissions at 80 percent of 1985 totals by 2010. Studies put the eventual cost of achieving this goal at 1 to 5 percent of world gross domestic product per year, with most of the cost attributed to the reduction in output needed to achieve the emission reduction. In today's world economy, this would be \$200 billion to \$1 trillion per year (\$1 trillion is almost twice the GNP of China and India combined). Hasty attempts to remedy the externality imposed by greenhouse gas emissions could have small benefits relative to these very large costs. A better understanding of the science of global climate change is needed before agreeing to policies with potentially large costs.

The Administration has taken view that a successful climate change strategy must be comprehensive, incorporating all relevant greenhouse gases, their sources and sinks; flexible, built on many diverse actions, and readily adjustable as knowledge improves; and integrated, designed to involve all nations. Integral to the U.S. climate change strategy is the world's largest program

of research and development. For FY 1993 the President's budget contains \$xxx billion for global change research, including \$xxx million for research in the economics of global change.

HEALTH AND SAFETY REGULATION

Decisions to wear a seat belt, to take a job as a telephone lineman, or to fly a small plane all involve balancing exposure to risk against other objectives. In the United States, government addresses risk indirectly, by providing the legal framework for the market and the tort system; and directly, by an extensive and growing program of safety regulation. For example, a 1967 NHTSA rule sets safety standards for automobile steering columns, a 1979 EPA rule regulates chemicals used to treat drinking water, a 1985 Federal Aviation Administration rule sets fire protection standards for aircraft cabins, and a 1990 EPA decision lists certain wood-preserving chemicals as hazardous wastes.

Proponents of a larger government role in health and safety assert that in these areas, people are not able to make proper decisions about risk bearing. Some also argue for intervention on equity grounds. If a certain risk is exceptionally high or prohibitively expensive for an individual to bear, society will sometimes assume the burden through regulatory intervention or public funding, as it does for neonatal intensive care, and burn and trauma centers.

The Congress has expanded budgets, staffs, and the regulatory scope of the agencies regulating these areas, almost tripling administrative costs of health, safety, and environment regulation between 1970 and the present. The *Federal Register*, which chronicles official actions of the regulatory agencies, including those that regulate health and safety, and whose size gives an idea of the regulatory burden on the economy, occupied 26 inches of shelf space for the year 1956, 36 inches for 1966, and over 10 feet at its apogee in 1978; in more recent years it has been somewhat thinner.

Public perceptions have fueled this regulatory growth. The public believes, according to surveys, that life is becoming more risky. In fact, life is becoming safer, as demonstrated by the steady increase in life expectancy, from 70.8 years in 1970 to 74.9 years in 1988; by the steady decrease in age-adjusted death rates from most diseases; and by the steady decrease in death rates on highways and in the workplace.

Public concern over risk has sometimes given rise to legislation requiring that all risk be eliminated. The Delaney Clause of the Food, Drug, and Cosmetics Act prohibits the use in food of any "substance shown to cause cancer in animals or