US Army Corps of Engineers®

Civil Works Environmental Initiatives

Value to the Nation

Supporting the National Environmental Strategy

Since the 1800's, the Corps has worked with and shaped nature to meet national water resources needs for sustaining human activities and public health. In solving water resources problems, the Corps examines options for meeting objectives that achieve a balance among economic growth, environmental health, and social well being. The Corps continues to adapt to new directions in water resources development resulting from Administration initiatives, as well as competing and often conflicting public needs, priorities, and preferences.

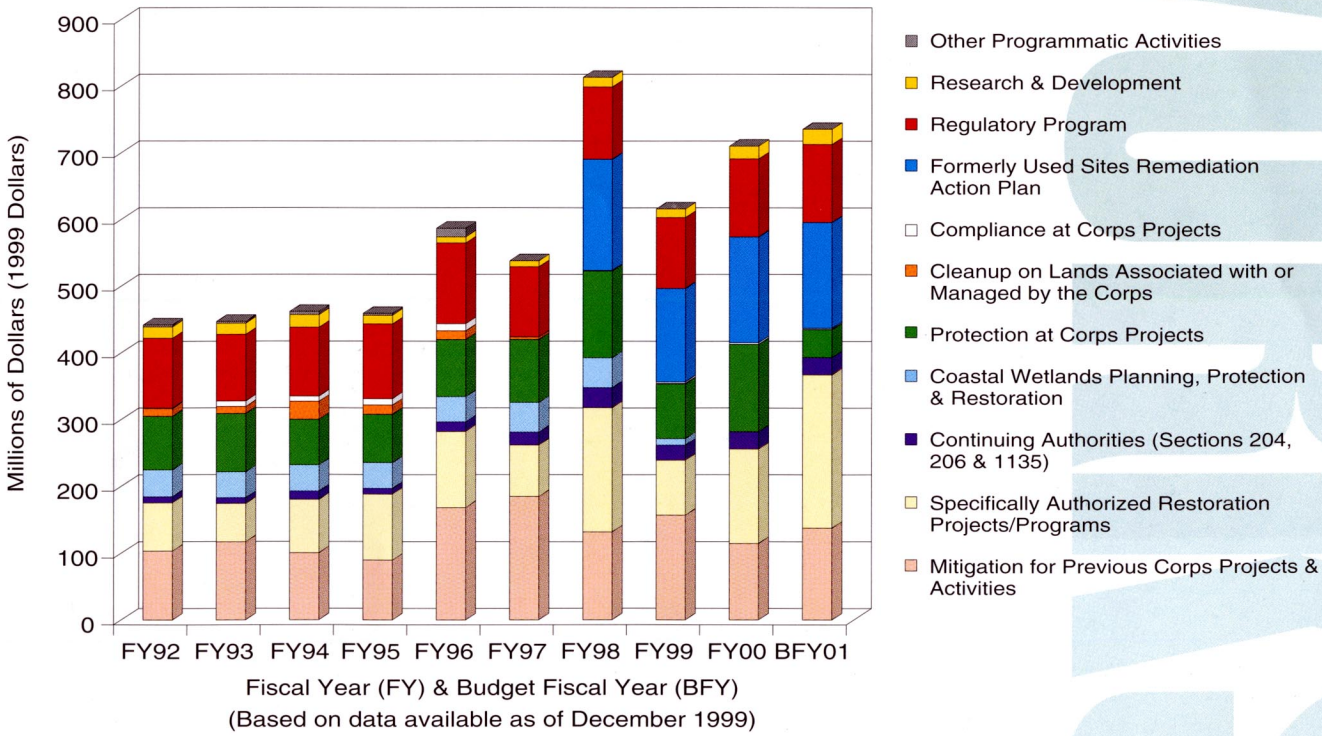
The Corps is developing a strategy for addressing the current and emerging national water resources challenges that will affect our national prosperity, sustainability, competitiveness, and quality of life. One of the challenges the Corps is focusing on is the growing national demand for environmental restoration and protection. The Corps is addressing this environmental challenge by rectifying the ecologically damaging effects of existing water resources projects and by taking advantage of opportunities to improve ecological systems and watershed resources.

Corps Civil Works Environmental Budget

The nature of the Civil Work's Environmental Initiatives has evolved from compliance with environmental laws and mitigation of adverse impacts to the planning and implementation of projects for the specific purposes of environmental restoration and protection. The investments that the Corps makes in the environment continue to benefit ecosystems, our social well-being, and the economy for present and future generations.

Recent changes in Corps budgets reflect diversification and growth in the environmental mission. Funding for environmental protection and restoration studies, projects, programs, and research represents close to 20% of the total Civil Works budget for Fiscal Year 2000 (FY 00), yet accounts for only around 1% of the entire Federal environmental budget. The Corps has invested this funding in an efficient, effective, and equitable manner to provide ecosystem outcomes in support of valuable human services, as part of an overall strategy to achieve integrated and sustainable water resources development.

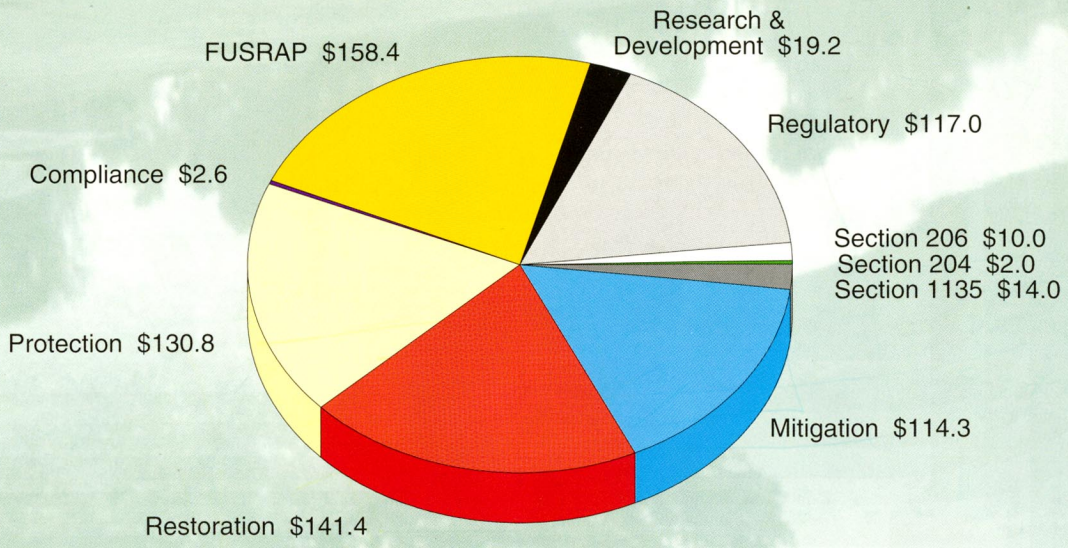
Civil Works Environmental Funding



Current State of Civil Works Environmental Initiatives

The portion of the Civil Works budget dedicated to protect, restore, and otherwise improve the environment has more than doubled over the past five years. More than half of the FY00 environmental budget will fund environmental restoration, clean-up (FUSRAP), and regulatory activities and programs. These funds are being applied to efforts to restore, maintain, and improve the quality of the wide variety of ecosystems throughout the country. A substantial portion of the environmental budget is dedicated to mitigation, protection, and compliance activities associated with Corps water resources infrastructure.

FY 2000 Environmental Budget ($ Millions)



Examples of Outputs from Programmatic Ecosystem Restoration Authorities

Authority and Description	Resulting Projects [1]	Corps Investment [2]
Section 1135, WRDA '86: Modify existing Corps projects and operations to improve the quality of the environment.	61 projects have been completed or are under construction, for the restoration and creation of over 92,000 acres of wetland, aquatic, riparian, and terrestrial ecosystems and over 48 miles of stream.	Approximately $57 million
Section 204, WRDA '92: Use dredged material to protect, restore, and create aquatic and ecologically-related habitats.	7 projects have been completed, or are under construction, for the creation, enhancement, and protection of approximately 2,500 acres of wetlands, shallow water, and beach habitats.	Approximately $4.6 million
Section 206, WRDA '96: Restore aquatic ecosystem through small projects, which are in the public's interest.	10 projects are currently being designed for the restoration and creation of approximately 30 acres of wetland, aquatic, and riparian ecosystems and 6 miles of stream. [3]	Approximately $5.4 million
Coastal Wetlands Planning, Protection, Restoration Act (CWPPRA): Plan, design, construct, and monitor coastal wetland restoration projects that provide long-term conservation of wetlands and fish and wildlife populations in Louisiana.	The Corps chairs the federal and state interagency task force and is the lead agency on 8 out of 47 projects that have been created or are under construction. It is anticipated that these 8 projects will restore over 3,900 acres of wetlands.	Approximately $19 million(includes operations, maintenance, and future monitoring)
Section 1103, WRDA '86: Implementation of the Upper Mississippi River System Environmental Management Program to replace and enhance habitat and implement long term resource monitoring on the upper Mississippi and Illinois rivers.	34 Habitat Rehabilitation and Enhancement Projects have been completed, resulting in the restoration, protection, or enhancement of over 35,000 acres of aquatic, wetland, and floodplain ecosystems.	Approximately $50 million

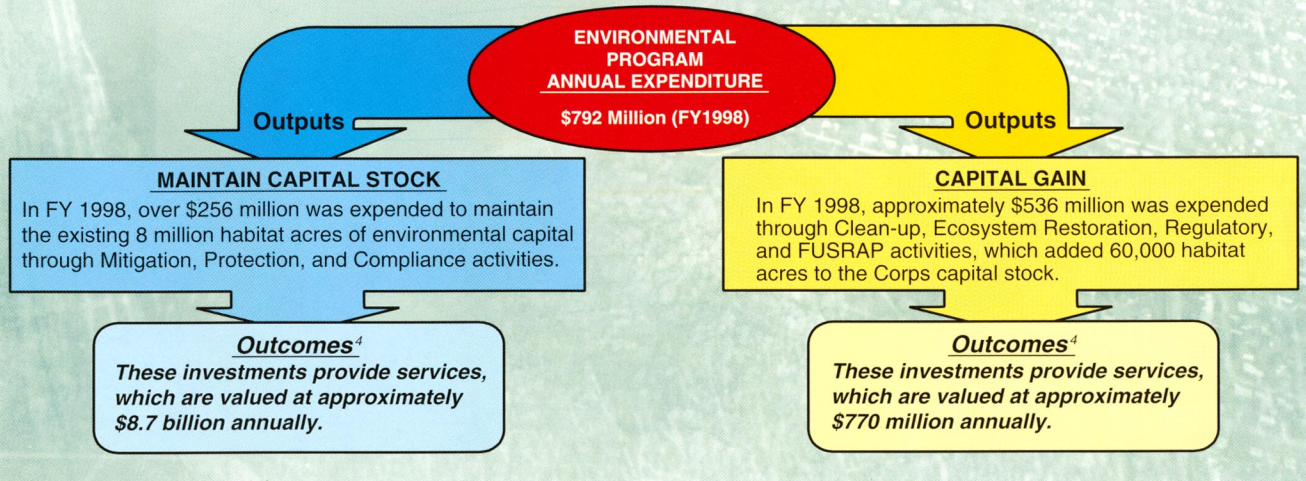
[1] *Information based on data available as of January 2000.*
[2] *Corps investment includes the Corps portion of the planning, design, and construction phases.*
[3] *Section 206 projects identified here are limited to those in the plans and specifications and combined planning/design phases.*

The Value of Environmental Services

Valuation of environmental services is difficult. It is much easier to determine the values for environmental infrastructure (waste treatment plants, confined dredge material disposal sites, etc.) than it is for ecological infrastructure (restoration of damaged ecosystems). We can measure "inputs" (expenditures) and "outputs" (waste treatment capacity, acres of habitat) of our respective environmental programs relatively easily. The great difficulty lies in measuring "outcomes"- i.e. the impact of improved water quality to aquatic species or enhanced nutrient cycling performance of restored wetlands, or increased sequestration of greenhouse gases. More difficult still, is the economic valuation of ecological outcomes.[4]

Capital Stock and Capital Gains

Over a 100 year period, Corps investments in both its water management infrastructure and more recently the broad array of environmental programs have resulted in beneficial ecosystem outputs and outcomes. This represents the environmental "capital stock" that has accumulated over the years. This environmental capital (non-tidal wetlands, lakes, upland, estuarine, wetlands, and riparian habitat) is supplemented annually with a growing environmental protection, restoration, and creation program that represents an annual "capital gain."



Environmental Outcomes of Corps Projects

Some of the key outcomes that are derived from the various Corps programs and provide improved ecosystem functioning in support of human services include:

- sequestering of carbon dioxide (CO_2)
- contaminant retention and decomposition
- plant and animal production
- maintenance of genetic information
- erosion control and sediment retention
- water supply storage and regulation
- dampening of environmental disturbances
- nutrient recycling

Carbon Dioxide Savings

Some other environmental outcomes are less apparent. Avoiding the generation of CO_2 is an incidental environmental benefit of Corps programs. The Corps generates 28% of all hydropower and avoids emission of about 84 million metric tons of CO_2 in place of coal-fired electricity generation. Water transport is the most energy efficient mode of transport. Carbon dioxide emissions from water transport were 10 million metric tons less in 1997 than if rail transport had been used.

Carbon dioxide "savings" of Corps hydropower and water borne transport annually add another $220 million and $56 million in services, respectively. Recreational services, which are beneficiaries of improved environmental quality (clean water, sandy beaches, diverse fish and wildlife resources), add over $1.4 billion in service value annually at Corps projects.

[4] Outcomes are estimated from studies integrated by Costanza et al. (1997: Nature 387: 253-259) and by others. Many other environmental services have not been priced, nor can they be priced, yet they add incalculable value. Most important are the values associated with ecosystem integrity and biodiversity.

EXAMPLES OF KEY ENVIRONMENTAL INITIATIVES AND PARTNERSHIPS ACROSS THE NATION

Corps investments in various partnerships and agreements are designed to sustain biodiversity and ecosystem integrity. The Corps has used its water resources planning, design, and construction expertise to implement environmental infrastructure through partnering efforts. The Corps enters into environmental partnerships to leverage financial and intellectual resources, gain better information for decision-making, and foster synergy in improving the quality of the ecosystem.

Columbia River Salmon Program includes fish passage facilities at 8 mainstem dams on the lower Columbia and Snake Rivers. From 1981 to 2000, over $1 billion was expended for fish passage facilities, salmon related research and hatchery operations, fish mitigation projects, and the Juvenile Fish Transportation Program.

Average Corps investment in the program exceeds $50 million per year for the past twenty years.

North American Waterfowl Management Plan (NAWMP) is an international effort to reverse declining waterfowl populations by protecting and improving waterfowl habitat nationwide. Over 4,500 acres of wetlands and shoreline in the Great Lakes region have been restored and enhanced through the beneficial use of dredge material. In addition, the Corps leases thousands of acres in the Mississippi Flyway to the U.S. Fish and Wildlife Service for waterfowl management purposes.

Since 1991 the Corps has invested over $1 million in NAWMP activities.

Coastal America is an interagency partnership effort to protect, preserve, and restore the Nation's coastal ecosystem. The Corps has the lead in over 50 such partnering arrangements.

Through partnerships, the Corps will restore and protect over 140 acres of tidal wetlands at Sagamore Marsh, Massachusetts and Galilee Marsh, Rhode Island.

Wetland Restoration
Through various partnerships, the Corps has restored, created, enhanced, preserved, and protected over 420,000 acres of wetlands throughout the U.S.

Through a cost-shared initiative, the Corps restored approximately 3,500 acres of habitat, including 2,600 acres of wetlands, in the Yolo Basin, California. The project provides critical habitat for threatened and endangered species and migratory birds. The project cost $17 million.

Central and Southern Florida Comprehensive Review Study is an ambitious partnership to restore and preserve South Florida's natural ecosystem and develop a sustainable economy for South Florida. The recommended plan includes 1.5 million acre-feet of storage reservoirs, creation of water preserve areas, creation of 30,000 acres of treatment wetlands, and removal of more than 240 miles of canals and levees and other actions to increase available water, ensure water quality, and reconnect the system.

Total implementation cost is estimated at $7.8 billion.

National Estuary Program identifies, restores, and protects estuaries along the coasts of the U.S., engaging local communities in maintaining the integrity of the whole system - its chemical, physical and biological properties, as well as its economic, recreational, and aesthetic values.

The Corps Salt Bayou Project in Texas reduced saltwater intrusion and protected/ restored over 60,000 acres of freshwater/brackish marshes adjacent to the Gulf Inter-coastal Waterway and Sabine Lake. The total project cost was approximately $1.9 million.

Upper Mississippi River System Environmental Management Program (UMRS EMP) is designed to protect and balance the resources of the Upper Mississippi River Basin and guide future river management. Partnership efforts have restored, created, enhanced, and preserved approximately 35,000 acres of habitat under the habitat rehabilitation and enhancement element of this plan.

Average annual Corps investment for the past fourteen years is $15 million.

Coastal Wetlands Planning Protection and Restoration Act (CWPPRA)
The Corps is the chair of the Interagency Task Force, which is responsible for identifying, prioritizing, and implementing projects that will restore coastal wetlands and provide for the long term conservation of wetlands and dependent fish and wildlife populations in coastal Louisiana. The Corps is the lead on 14 active CWPPRA Projects that will restore over 15,250 acres of wetlands.

Since FY1992, the Corps has received over $50 million to study, design, or construct 17 CWPPRA priority list projects.