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A National Dialogue About  
America's Water Resources Challenges  
For the 21st Century:



National Report on Identified  
Water Resources Challenges and  
Water Challenge Areas



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## Table of Contents

Introduction to Listening Sessions .....	2
General Challenge 1: Marine Transportation System .....	6
General Challenge 2: Restoring and Protecting the Environment .....	8
General Challenge 3: Managing Watersheds Holistically .....	10
General Challenge 4: Floodplain and Coastal Zone Management .....	12
General Challenge 5: Responding to Natural Disasters .....	14
General Challenge 6: Community Water Infrastructure .....	16
General Challenge 7: Regulating Dredge and Fill Activities .....	20
General Challenge 8: Recreation .....	22
General Challenge 9: Project Processes .....	24
General Challenge 10: Institutional Changes .....	26

# NATIONAL REPORT: WATER RESOURCES CHALLENGES

*There are many competing and conflicting demands on water resources.*

*Water plays a major role in how we live and work. But are we taking this critical resource for granted? The Corps of Engineers has attempted to better define and understand National water resources issues through research and Listening Sessions that we held during 2000.*

The purpose of the Listening Sessions was twofold. First, it was to provide citizens an opportunity to voice concerns about pressing water resources needs, problems, and opportunities that impact their lives, communities and future sustainability. Secondly, it was to provide citizens an opportunity to tell us what they believe the Federal role should be in addressing those concerns. Because one of the purposes of the Listening Sessions was to allow people to

voice their own concerns, no process was implemented to bring these views to consensus or to recommend any specific action on behalf of any particular organization.

We present 10 challenge areas that the participants of these Listening Sessions discussed. Actually, the attendees provided more than 3,400 specific concerns, which we regrouped into 10 challenge areas. More detailed reports of each Listening Session are available, and we encourage you to review them on our web site: [www.iwr.usace.army.mil/iwr/waterchallenges](http://www.iwr.usace.army.mil/iwr/waterchallenges). In particular, we invite you to read our summary report of all Listening Sessions: America's Water Resource Challenges for the 21st Century: Summary Report on Identified Water Resource Challenges and Water Challenge Areas.

The views expressed in this report reveal topics and concerns on the minds of those attending

*Listening Session participants cited a growing need for additional and enhanced recreational opportunities.*



the Listening Sessions. The intent of this document is to present these views in a consolidated form and to provide sufficient background information so as to place the issues raised in a context. The views contained in this document do not necessarily represent a regional recommendation or Corps of Engineers policy. They simply distill the sentiments of people who cared enough to attend and talk about water resources issues on their mind. Therefore, this document should not be taken as advocating any particular opinion or making any specific recommendation. It is offered in the spirit of promoting a continuing dialogue on issues of vital interest to this Nation. As part of our process to update our Civil Works Strategic Program Plan we have used information from the Listening Sessions to develop our goals and strategies.

Solutions to water resources challenges are complex and will require the concerted effort of many government organizations, at all levels, in working for the good of the Nation. This effort however, is not something for the government to address alone. Solutions will not be successful without the involvement and participation of all Americans. The more people that get involved, the better the results will be.



*Development in floodplains continues to grow, despite the fact that over 8 million homes and buildings are at risk today in the U.S.*

**Table 1. Emerging Water Resources Challenges**

#1 Marine Transportation System	Transform the Marine Transportation System to meet 21st century demands.
#2 Restoring and Protecting the Environment	Restore degraded environment resulting from past development and seek to protect the environment in new development.
#3 Managing Watersheds Holistically	Achieve balance between social needs, economic development and the environment within an entire watershed.
#4 Floodplain and Coastal Zone Management	Protect Americans from severe storms/natural disasters to minimize social, economic, and environmental impacts.
#5 Responding to Disasters	Plan for, prepare for, and respond to emergencies resulting from natural disasters and technological emergencies.
#6 Community Water Infrastructure	Consider and plan for the implications of aging water resources infrastructure, urban growth and development, and water supply and treatment on a community's ability to be prosperous and sustainable.
#7 Regulating Dredge and Fill Activities	Ensure fair, adequate, and efficient permitting to protect wetlands and other waters of the US from development and improper use.
#8 Recreation	Provide recreation opportunities for all American's and their guests on national lands and waters.
#9 Project Processes	Ensure significant communication, information, public input, and analysis for successful project development.
#10 Institutional Changes	Streamline and improve Federal water resources authorities, laws, policies, and funding to better align the Federal government's priorities, goals and objectives.

## Initial Assessment of Water Resources Challenges

Our initial assessment of trends, research from past studies, literature searches, and consultation with selected water resources experts led us to believe that the Nation is facing a series of important water resources challenges with serious implications. We identified the following six global challenges:

- 1 Stress on the national marine transportation system: Our Nation's water highway system may not be able to meet 21st century demands.
- 2 Continued development of flood-prone areas: Flooding continues to threaten our Nation's communities.
- 3 An aging national water resources infrastructure: America's water resources infrastructure may not support future generations.
- 4 Environmental consequences of past development: Our environment has been damaged and needs to be repaired to offer future generations sustainability of natural and cultural resources.
- 5 Opportunities to leverage water resources for smart growth: Many communities lack adequate water and sewer systems necessary for their sustained development.
- 6 A need to ensure the capability to respond to disasters: Our Nation's capability to respond to disasters is being stretched.

## General Trends and Assumptions

Our research has indicated that several trends have emerged regarding competing and conflicting demands on water resources. They are:

- Foreign trade now accounts for 29% of Gross Domestic Product (GDP). Tonnage that moves on our inland navigation system is projected to grow by as much as 37% and

### LISTENING SESSIONS ACROSS THE NATION





tonnage entering and leaving our ports and harbors is expected to double over the next 20 years. As global markets expand, the demands of international commerce will require that ports and harbors built in the 1930's be modernized to accommodate projected demands and a new generation of vessels being produced to transport those goods.

- Floods will continue to be a serious national problem. Approximately 9% of the U.S. is prone to flooding, putting eight million dwellings and other structures at risk. Development in floodplains continues to grow by 1.5-2.5% annually.

- Urban water demands and needs are becoming more complex. Conflicts in usage of the current water supply are growing among multiple users with diverse and often conflicting needs.
- Americans now place environmental values near the forefront of social priorities. There is increasing emphasis on managing watersheds holistically and achieving a balance between social needs, economic development and the environment.
- America's water resources infrastructure is nearing or surpassing its 50-year planned design life, which has the potential to affect reliability and performance adversely.

Ensuring reliable and expected performance levels requires rebuilding or replacing existing locks, recreation facilities, hydropower facilities and other water resources infrastructure.

- The interested public expects to be part of the information sharing and is adept at using information technology for becoming informed. This requires that Federal agencies keep pace with technology and demands for information so that the public can connect ideas, people, and technology more rapidly and efficiently.



*America's water resources infrastructure is nearing or surpassing its 50-year planned design life. Ensuring reliable performance levels requires attention to maintenance capacity improvements, rebuilding, or replacing existing locks to meet traffic demands.*

## Results of the Listening Sessions

From June through November 2000, the Corps of Engineers conducted 14 regional Listening Sessions across the country, plus two National-level meetings to give citizens the opportunity to voice their concerns about future water resources challenges facing the Nation. A cross-section of concerned stakeholders participated in the workshops—nearly 1,300 attendees—including representatives from Federal, state, and local agencies, tribes, environmental organizations, port authorities, private companies, legal professionals, livestock/farming operators, navigators, journalists, and homeowners. The Listening Sessions were open to the public and designed to be a combination of small group and plenary sessions. Corps partici-

pation was limited to note taking. Consensus on water resources issues was not sought.

We present 10 challenge areas that the participants of these Listening Sessions discussed. Actually, the attendees provided more than 3,400 specific concerns, which they regrouped into a smaller set of challenges at each workshop. Each workshop generated a set of between 30 to 50 water resources challenges. In total, people identified 542 water resources challenges across the 14 Regional Workshops. We then combined the duplicate and related water resources challenges into 18 specific water resources challenge areas. These 18 challenge areas are described in our report titled: America's Water Resource Challenges for the 21st Century: Summary

Report on Identified Water Resource Challenges and Water Challenge Areas. This report is available on our web site:

[www.iwr.usace.army.mil/iwr/waterchallenges](http://www.iwr.usace.army.mil/iwr/waterchallenges).

Some of the 18 water resources challenge areas are similar. Therefore, we regrouped them into 10 general water resources challenge areas (see table 1 below). For example, we grouped the following four challenge areas: Water Supply, Wastewater Treatment, Smart Growth, and General infrastructure into Community Water Infrastructure. Each of the 10 general water resources challenges will then be reported in terms of some key facts and a summary of views from participants about what they believe the Federal role should be in addressing that challenge.

*Tonnage entering and leaving our ports and harbors is expected to double over the next 20 years.*



# MARINE TRANSPORTATION SYSTEM

*Transform the marine transportation system to meet 21st Century demands*

*Commerce accounts for 13 million jobs.*



## World Market Competitiveness

The Marine Transportation System (MTS) is nearing capacity while international and domestic trade demands continue to grow. During 1999, 29% of U.S. GDP and nearly 20% of U.S. employment (13 million people) were associated with international trade. The total volume of domestic and international marine trade is expected to double by 2020 to more than 4 billion tons of cargo per year. Inland traffic movements are projected to increase from 630 million tons today to 830 million tons by 2020. The inland MTS is becoming overly congested and unreliable in critical spots. Over 99% of U.S. overseas commerce (1.3 billion tons) by volume relies on Federally maintained waterways. About 2.3 billion tons of commodities, over 20 million loaded containers, and 90 million passengers move annually through our deep sea and river ports. Our Nation's marine transportation system (MTS) consists of approximately 900 deep and shallow draft harbors with nearly 10,000 commercial marine facilities and 237 lock chambers. The MTS connects to 152,000 miles of rail, 460,000 miles of pipelines, and 45,000 miles of interstate highways.

Annually the MTS provides enormous national benefits:

- Creates employment for more than 13 million people (20% of U.S. employment), and contributes about 29 % (\$742 billion) of national Gross Domestic Product (GDP).
- U.S. ports and waterways move about 2.3 billion tons of domestic and international freight having a value of approximately \$1.01 trillion.
- Imports 3.3 billion barrels of oil to meet U.S. energy demands.
- Moves over 60% of the Nation's grain exports and 95% of soybean exports.

- Serves 78 million Americans engaged in recreational boating.
- Transports 134 million passengers by ferry.
- Hosts more than 5 million cruise ship passengers.
- Supports 110,000 commercial fishing vessels and recreational fishing that contribute \$111 billion to state economies.
- Provides 3 to 20 times less pollution per ton of cargo moved, as well as reduced accident risk compared with alternate transportation modes.

## Infrastructure Performance

The United States has 47,000 miles of coastline, lakes, and rivers, nearly twice the circumference of the earth. About 25,000 of those miles are navigable waterways and make up the MTS. The MTS is a valuable resource that is critical to meeting demands of the 21st Century. The U.S. is heavily dependent on marine transportation for the safe and reliable movement of our commerce.

Locks are generally built with a 50-year design life and are sized for commercial fleets expected to operate within that time frame. While lock age does not always correlate with performance, it is an indicator of system obsolescence. More than 50% of the locks in operation today were built during the 1930's or earlier for a much different commercial fleet than we have today. Locks built during this time frame were generally designed for a tow configuration that was between 600 and 800 feet long. Today's tows are on average 1,200 feet long and make more trips on the inland navigation system every year. Because tows are 1,200 feet long they require two lock operations to fit through a 600-foot long lock, which ties up the lock and creates delays for the tow locking through and all other tows waiting to pass through a lock. Forecasts indicate that locks will be asked to accommodate 30% more commerce by 2020. This means that locks will have to open and close two to four times more often than they were designed to do. The increased wear and tear of the locks will lead to increased lock maintenance and the replacement of major components. A lock mod-



*The container ship of choice is rapidly becoming a vessel requiring 45-50 feet of depth.*



## GENERAL CHALLENGE 1: MARINE TRANSPORTATION SYSTEM



*Most of the Nation's lock chambers were built in the 1930s and are now locking twice the capacity they were designed for, causing half a million hours in delays per year.*

ernization program has been underway since the passage of the 1986 Water Resources Development Act (WRDA '86), with \$1.7 billion invested on 14 locks through 2000 and an additional \$3.4 billion programmed for construction at an additional 13 locks. However, funding below optimum construction schedules for these projects has increased construction times by one to five years, resulting in direct cost increases of nearly \$250 million from inflation and an estimated \$1.7 billion in transportation savings foregone.

Delays at undersized locks can add several days to transit times, thus increasing transportation costs, which in turn impacts international competitiveness. Lock delays associated with the current system amount to over 550,000 hours annually, representing an estimated \$385 million in increased operating costs borne by shippers, carriers, and ultimately consumers. For example, the U.S. has already lost about 30% of the soybean market that it has with Europe to Brazil and Argentina -- both of which have been investing heavily in their inland waterway systems. Among the 39 locks with high average delays in 1999, 18 are on the Upper Mississippi River and the Illinois Waterway systems, six are on the Gulf Intra-coastal Waterway (GIWW) or its connecting channels, and fifteen are on the Ohio River system.

The containership of choice is rapidly becoming a vessel requiring 45–50 feet of depth. Few US ports have that depth, but many Asian and European ports do. Halifax and Vancouver in Canada and Freeport in the Bahamas are reminders that there are able competitors for

international trade. Global competitiveness requires us to have ready ports, which requires maintaining ready channels. Delays due to shoaling or lock capacity will make our MTS unreliable. Failure to respond effectively and efficiently means a second class marine system

with less competitive ports, higher prices for consumers, less economic growth, and fewer jobs. It is worth noting that every \$1 dollar invested to improve navigation infrastructure raises the GDP – America's productivity – by more than \$3 dollars.

### What We Heard at the Listening Sessions

The state of the Nation's MTS was identified as an important challenge at practically all the Listening Sessions. Participants at the Listening Sessions identified several key concerns related to the MTS. The concerns were centered on transforming the MTS that was built for the needs of the 1930's, into a system ready to meet tomorrow's demands. Many participants agreed that the navigation infrastructure was generally aged and in need of modernization. Participants called for a variety of improvements, including replacement of locks and dams on the Upper Mississippi River and Illinois Waterway, and deepening of harbors and shipping channels in the Great Lakes.

Dredging and dredge material disposal was seen as an important issue in navigation improvements. Many participants at the New Brunswick session focused on dredge disposal and the need to ensure a predictable volume of flow. Clean dredge material can be beneficial for beach nourishment and construction projects; however, contaminated sediments must be disposed of in permitted locations. Some believed that greater attention should be paid to the dredge material disposal problem to both improve the process for deciding about disposal siting, and to obtain greater financial contributions of those who directly benefit from the deeper channels. At the Louisville session, participants discussed the need for adequate funding and ways to minimize sediment build-up in waterways.

Areas of concern also included navigation infrastructure improvements, growing backlog of maintenance, environmental restoration, reducing fertilizer runoff from agricultural fields, minimizing sediment build-up in waterways, and sources and levels of funding. Participants

highlighted environmental issues related to dredging and disposal of dredged material. Some called for improving the process for deciding about dredge disposal sites and asked for financial contributions to be made by those who directly benefit from deeper channels.

In Alaska and Hawaii, where the water transportation system is the equivalent of the road system in the lower 48 states, many attendees noted that water transportation improvements for poor, isolated communities were vital to the survival of the communities themselves. However, a special concern for such areas was the limited ability of poor communities to afford local sponsorship requirements is quite limited.

Many called for comprehensive regional port planning and modernization of the inland waterway infrastructure to allow greater capacity and efficiency of the system. Participants referenced the new Mega-Container ships (currently operating in the U.S., Asian, European and other markets) which require wider and deeper channels at many US ports. People identified that support is needed for poor and isolated communities in Alaska and Hawaii, where the water transportation system is the equivalent of the road system in the lower 48 states. Additionally, participants recommended incorporating environmental issues in feasibility studies to properly assess all potential environmental impacts of suggested navigation improvements and to coordinate across Federal, state, and local agencies regarding dredging contracts. To ensure that recommendations are implemented, participants generally agreed that sufficient funds need to be made available and the public is kept well informed and educated about the value of an efficient and effective MTS.

## RESTORING AND PROTECTING THE ENVIRONMENT

*Restore degraded environment resulting from past development and seek to protect the environment in new development.*

### Impacts by Humans

The environment has suffered a heavy toll from past development and must be restored, or managed with a new ethic fostering sustainability for both current and future generations. An estimated one third of the native U.S. flora and fauna is considered to be of "conservation concern," and is considered to be vulnerable, imperiled or critically imperiled. Currently 511 animal species and 736 plant species are Federally listed as threatened or endangered in the U.S. The ten major causes of habitat loss and degradation have been identified to be: agriculture, land conversion for commercial development, water development, outdoor recreation, livestock grazing, pollutants, infrastructure development, disruption of fire ecology, logging, and mining, oil and gas and geothermal exploration and development. According to the Environmental Protection Agency's (EPA) 1996 National Water Quality Inventory, approximately 64% of 694,000 miles of rivers and streams were surveyed to determine how well rivers and stream supported multiple uses, including drinking water supply, fish and wildlife habitat, recreation, agriculture, as well as flood prevention and erosion control. Of rivers and stream studied, 8% were in good but threatened condition and 36% were in fair to poor condition. Sedimentation and excess nutrients were the most significant causes of degradation followed by bacteria, oxygen-depleting substances, pesticides, habitat alterations, suspended solids, and metals. States, tribes, territories and interstate commissions reported in 1998 that about 40% of the U.S. streams, lakes and estuaries that were assessed were not clean enough to support uses such as fishing and swimming. Over the past 30 years, the Nation has become much more attuned to the many ways healthy ecosystems support the economy and provide for the public good. Passage of the National Environmental Policy



*The Black-bellied Whistling Ducks are propagating and increasing their numbers thanks to habitat restoration.*



*People said that the Federal government should assess and monitor environmental health.*

Act (NEPA) in 1969, was the beginning of a new era where economic development no longer takes precedence in land use decisions without due consideration of environmental impacts. Even though progress has been made, the legacy of the past remains. More work is needed.

### Biodiversity

America is far richer in plant and animal species than previously believed. But the survival of the country's unique natural heritage is in serious jeopardy, according to a study by the Nature Conservancy and the Association for Biodiversity Information (ABI) entitled "Precious Heritage: The Status of Biodiversity in the United States." By documenting the presence in America of more than 200,000 native species -- double the previous estimate -- the study highlights the U.S. as a globally important center of diversity, home to fully 10 percent

of all species described by science thus far. The Nature Conservancy found that as many as one-third of the Nation's species are at risk, and at least 500 species are extinct or are missing.

The single biggest threat to species survival is loss of habitat, with almost 60 percent of America's landscape already severely altered. Other threats identified are the introduction of alien species, over-exploitation, disease, and pollution. The United States has more than 3.6 million miles of rivers and streams, ranging in size from the mighty Mississippi River to small creeks. These corridors are complex ecosystems that perform a number of biological and ecological functions, such as modulating stream flow, storing water, and providing habitat for aquatic and terrestrial species. The cumulative effects of development have resulted in significant changes to these ecosystems. Estimates are that between 70-90% of riparian habitats have



## GENERAL CHALLENGE 2: RESTORING AND PROTECTING THE ENVIRONMENT

been lost or altered, adversely affecting the viability of plant and animal species.

### Importance of Wetlands

Within the contiguous United States, over 53% of the Nation's original wetland acres have been lost due to human actions. The loss of wetlands continues today, but passage of laws like the Water Resources Development Act (WRDA) of 1986 has significantly reduced the rate of wetland loss. By 1995, about 46% of the country's original wetlands remained. Wetlands annually provide about \$14.8 billion in ecosystem services such as flood regulation; waste filtration; and important habitats for estuarine and marine

fish and shellfish, waterfowl, shore birds, wading birds and mammals. A number of wetland systems are included in the nearly 30 types of ecosystems within the U.S. that have been identified as critically endangered, having lost more than 98% of their extent since European settlement. Approximately 35% of all Federally-listed rare and endangered animal species either live in or depend upon wetlands, and the EPA has estimated that coastal wetlands along the Gulf of Mexico provide essential habitat for three quarters of the Nation's migratory waterfowl.

Of the 12,400 miles of streams and rivers in the U.S. impacted by acid mine drainage, 85-95% receive the pollution from surface and under-

ground mine lands abandoned prior to the enactment of the Surface Mining Control and Reclamation Act (SMCRA) of 1977. Left behind are rotted support structures in jeopardy of collapse, open shafts and open pits, unstable walls, deadly gases, explosives, stock piles of toxic and physically unstable waste materials subject to erosion. The damage from abandoned mine lands includes landslides, flooding, water pollution, destruction of fish and wildlife habitats, impairment of natural beauty, damage to private property, creation of hazards dangerous to life and property, and a general degradation of the quality of life in local communities.

### What We Heard at the Listening Sessions

Discussion about responsibly protecting (through monitoring and management) and restoring the environment was common at all Listening Sessions. There was general agreement that human interference is the main contributor to environmental loss. People discussed in great detail issues related to resource monitoring, habitat management and maintaining sufficient levels of biodiversity. Participants expressed concern that ecosystems (particularly wetlands) and the environment in general are not being adequately protected in new development or restored from past development. People also discussed the impacts of global warming on wildlife and human habitats. Participants noted the cumulative negative impacts of development (dam construction, dredging, water level management, and channelization) on ecosystems functions related to water filtration, floodwater storage, recreation, and species habitat. Attendees highlighted that cumulative impacts are not fully taken into account during the project planning process.

Participants believed that ecosystems are continuing to be destroyed for several reasons. One reason cited was that the cumulative or indirect impacts of development on the ecosystem are not sufficiently considered. Another reason cited was that the cost-benefit analysis applied in project decision making is biased against projects with higher environmental benefits because these benefits are hard to quantify. People felt that the Federal government should create cost-sharing incentives to

encourage environmental benefits. Some participants pointed out that mitigation requirements of development projects are not properly enforced, and that a backlog of incomplete mitigation projects exists. Attendees voiced strong opinions that the Federal government should assure that unavoidable environmental impacts are fully mitigated. To accomplish this, people said that the Federal government should assess and monitor environmental health, test mitigation techniques, and develop environmentally friendly technologies. The focus on quantity rather than quality of mitigated habitat was another issue raised by participants. An overarching reason for the continued destruction, some participants felt, is that mitigation of wetland loss is being allowed when prevention of the loss would be preferable.

People suggested that Federal and state agencies work together more effectively to create consistency among agencies in environmental regulations, especially regulating wetlands. Many suggested that the government agencies streamline processes by collaborating and coordinating reviews and data sharing. People asked for better public coordination and an education program addressing environmental issues. It was recommended that all government agencies form a team to collaborate on educating the public on environmental concerns and water resources issues.

Participants recommended distribution of specific environmental data about existing ecologi-

cal and environmental conditions; the effects of development and the effectiveness of restoration activities; and quantifying and including environmental benefits in decision making about mitigation and development opportunities. Those from other Federal agencies spoke about the need to coordinate agency policies better and to view environmental problems from a river basin or watershed perspective.

Some participants noted that traditional planning techniques are not as sustainable as they can be and called for more flexible "thinking outside the box." Some believed that cost-benefit analyses for project decision making are biased against projects with high environmental benefits. People recommended revising Federal planning policy to make the environment an equal goal with economic benefits in criteria for project selection. People also suggested that feasibility studies should be 100% Federally funded so those studies can consider whole watersheds and identify all of the cumulative impacts in a watershed for given actions. In Omaha, NE people talked about trade-offs between environmental benefits (e.g., protection of salmon) and economic benefits, and research about exotic species, such as the Zebra Mussel. Those in Anchorage, AK debated water quality in national wildlife refuges. Protection of wetlands, habitats, and species was a common subject of discussions in Louisville, KY, St. Louis, MO, Woburn, MA, and New Brunswick, NJ.

## MANAGING WATERSHEDS HOLISTICALLY

*Achieve balance between social needs, economic development and the environment within an entire watershed.*

### Watershed Perspective

The term watershed refers to a geographic area in which water, sediments, and dissolved materials drain to a common outlet -- a point on a larger stream, a lake, or river; an underlying aquifer; and estuary or an ocean. Watersheds range in size from a few square meters to more than 3 million square kilometers. There are approximately 2,150 small watersheds in the United States within 21 large river basins.

Managing watersheds holistically focuses upon the total matrix of natural resources and ecosystems within an area, starting from the crest of a mountain range; incorporating the forests, streams, groundwater, lakes, rivers, wildlife, communities within the basin; and continuing down to the eventual outflow of the rivers to the next geographic basin. Currently full watershed impacts are generally not considered when developing local projects. The Water Resources Development Act of 2000 broadened the Federal watershed perspective to include the

full matrix of natural resources and ecosystems.

Communities across the Nation are finding that their water resources are degrading, thus impacting their community's ability to grow. They are also discovering that they can only protect these local water resources by thinking in terms of an entire watershed. Local watershed management efforts are diverse; for example, some communities in the Pacific Northwest are trying to save salmon habitat, while others in the Southwest are striving to maintain groundwater quality. Even though a single activity may not appear to impact a watershed, people are finding that when multiple activities in small upstream watersheds are considered cumulatively there are impacts to processes in larger downstream watersheds.

Seeking a balance between social needs, economic development and the environment to resolve competing demands on water resources is seen by many as the right way to manage watersheds. Communities quickly find many



*Environmental sustainability can be achieved through river basin planning.*

reasons to manage local watersheds for multiple purposes, e.g. economic benefits, recreation, flood prevention, preparedness from natural disasters, water supply, enjoyment of scenic vistas, or the overall quality of life.

A holistic watershed management approach can be used to enhance and expedite planning and implementation of projects. This type of approach helps to identify knowledge and program gaps, resolve conflicts and formulate priorities for action. The process seeks to bring together local landowners, resource managers, and key interests to formulate goals and initiate activities to restore and improve habitat and native fisheries, improve water supply and quality, and foster community development within the region. However, project cost-sharing requirements and political boundaries can and often do complicate the adoption of a holistic focus.

We have dammed our rivers to provide flood control, low-cost hydroelectric power, recreation, and water supplies for our homes, businesses, and farms. These are all good things that have contributed significantly to our Nation's economic prosperity and social well being, but they have been done at the expense of the environment. Habitat and species have been lost, wetlands have been drained and filled-in, which resulted in their beneficial functions being degraded or lost. Increasingly society is unwilling to accept such losses and has called for balanced approaches that can provide acceptable levels of economic development while protecting environmental amenities and social well being. The term most often used to characterize this aim is "sustainable develop-



*Developing watershed visions requires input from all stakeholders.*



## GENERAL CHALLENGE 3: MANAGING WATERSHEDS HOLISTICALLY

ment.” While the ideal of sustainable development is well accepted, defining sustainable development in practical, project-specific terms is often a conflict-laden and contentious process. The most significant water resources challenge facing us as a Nation is finding the appropriate balance among social needs, economic development and environmental quality in specific resource-use ways. Striking this balance will require compromises, good science, enlightened policies, and a willingness to engage in honest debate.



*Upstream planning affects downstream life.  
River life, city life... life in all its forms.*

### What We Heard at the Listening Sessions

Many participants believed that a balanced, holistic watershed management approach to economic and ecosystem needs is important to water resources management and planning. Generally, people felt that decision-makers should analyze water resources comprehensively and at a watershed level prior to taking any actions within the watershed. People mentioned activities, such as land use planning, should be conducted and managed on a holistic and comprehensive basis.

Attendees said that the Federal government should help to identify issues for integral management and planning, including storm water, non-point source pollution, water supply, flood protection, groundwater, water quality, wetlands, sedimentation, data collection, and ecosystem restoration. Many participants believed that a balanced, holistic approach to water resources management and planning. A unique perspective on integrated water resources management and planning was raised in Honolulu, where participants felt that a “mountaintop-to-seabed” perspective was needed to adequately address water resources in an island context. Honolulu participants also discussed the integration of varied stake-

holder interests into an overall plan. St. Louis participants mentioned the need for a consensus-based vision for the Mississippi River watershed.

Participants felt that an important component of coordinated water resources management was the involvement of all stakeholders in the planning process. In Phoenix, participants commented on the need to bring stakeholders to the table to cooperatively develop a long-term, “big-picture” plan for the region. Several participants felt that a “vision” should be developed for a region’s water resources. Inter-agency and inter-jurisdictional coordination was an important issue raised by participants because of the range of issues and jurisdictions involved in water resources management and planning. It was noted that such coordination could increase the efficiency of management and planning activities in the watershed. Participants felt that an important component of coordinated water resources management was the involvement of all stakeholders in the planning process and the creation of forums and conflict resolution mechanisms. Many participants noted that the Federal government is in a unique position to encourage or coordinate regional management and planning activities that span multiple jurisdictions.

Participants at the Listening Sessions expressed a need for the Federal government to plan and manage watersheds holistically in the following ways:

- Seek water resources solutions for ecosystem restoration and environmental sustainability along with economic development.
- Provide 100% Federal funding and technical expertise to assist watershed planning efforts. Two reasons are: 1.) Because proposed projects usually occupy a small portion of a watershed, it is economically infeasible for a single project sponsor to cost share the evaluation of an entire watershed; and 2.) Because watersheds cross jurisdictional and state boundaries.
- Coordinate watershed planning involving all stakeholders and agencies (Federal, state, and local).
- Change legislative authorization and resource allocation to promote regional planning.
- Help identify watershed-level goals that can be implemented locally.

## FLOODPLAIN AND COASTAL ZONE MANAGEMENT

*Coastal infrastructure is vulnerable to erosion from storms and other natural disasters.*



*Protect Americans from severe storms/natural disasters to minimize social, economic, and environmental impacts.*

### Floodplain Risks and Costs

Protecting Americans from severe storms/natural disasters through astute planning and management of floodplains and coastal zones minimizes social, economic, and environmental impacts. Preventing flood damages and shoreline erosion has always been a traditional role for many agencies within the Federal government. The primary Federal agency responding to disasters is the Federal Emergency Management Agency (FEMA). FEMA was formally created in 1979 when President Carter created the Cabinet level position. However, FEMA traces its roots back to the Congressional Act of 1803. In the century that followed the Act of 1803, ad hoc legislation was passed more than 100 times in response to hurricanes, earthquakes, floods and other natural disasters. During the 1930s, the Flood Control Act's gave several Federal agencies even greater authority and responsibility to implement flood control and shoreline protection projects.

Flooding is the most destructive and costly natural disaster in the United States, accounting for 85% of all natural disasters that occur annually. Approximately 9 out of every 10 presidential disaster declarations are associated with flooding. The United States has made a major investment in flood damage reduction infrastructure consisting of more than 400 major lake and reservoir projects, 8,500 miles of levees and dikes, and hundreds of other types of local flood protection projects. An estimated \$706 billion in damages in the U.S. have been prevented, most within the past 25 years. The cumulative cost of constructing and maintaining these projects is \$119 billion, about a six to one return on the investment. On average, flood-related damages have been reduced by \$22 billion annually. Despite this substantial investment, floods still cost our Nation over \$4 billion

dollars annually in property losses and emergency assistance.

Floods have affected the lives of more people than any other type of disaster, including war, drought, and famine. Events such as 1999's Hurricane Floyd brought flood disasters into American living rooms and underscored in graphic detail the enormous economic and social costs of flooding: personal trauma and stress on individuals and families from evacuations and life in temporary quarters, the loss of irreplaceable family heirlooms, as well as the destruction of place and neighborhood. Many people remember the images on the evening news of an electrical fire destroying eleven buildings in the flooded downtown area of Grand Forks while firefighters could only watch helplessly.

All evidence indicate that floods, and the monetary and personal losses associated with them, will most likely increase in the future. Urban development in floodplains continues, increasing by 1.5% to 2.5% annually. FEMA estimates that 94 million acres of the United States lie within the 100-year floodplain. Flood damages are especially increasing in areas where development is occurring inside the "100 year" floodplain that exists along the Nation's streams and shorelines. Today less than 15% of the more than 20,000 communities in the United States have structural flood protection, and only 20-30% of at-risk buildings are covered by national flood insurance. The Multi-Hazard Identification and Risk Assessment report published by FEMA in 1997 concluded that 9.6 million U.S. households and property valued at \$390 billion are "at risk" of flooding. Six to eight million dwellings and other buildings are estimated to be located in these flood prone areas. However, this assessment may be understated since most floodplain maps are outdated

– by more than 20 years in many communities – and nonexistent in many developing areas. The administrator of FEMA noted that the annual Federal budget for moving populations out of harm's way soared from \$835,000 in 1993 to \$10 million in 2000.

The Water Resources Development Act of 1999 includes an initiative referred to as Challenge 21. Challenge 21 expands the use of non-structural options to achieve the dual purposes of flood damage reduction and the restoration of riverine ecosystems. This approach responds to those communities who have expressed a strong desire to aggressively reduce or even eliminate repeated losses and improve the quality of their environment by creating partnerships with these state, tribal and local entities, allowing their priorities to be realized. Currently there is increasing emphasis that the integration of planning and preparedness activities, such as flood insurance, zoning regulations, watershed management, and flood-proofing, coupled with management measures like flood control structures, building improvements, and emergency operations is the basis for a sound approach to comprehensive floodplain management.

### Coastal Hazards

Our coastlines are a special concern because rapid population migration to coastal areas is occurring. The United States has more than 19,000 miles of beaches. Since 1980, the population migrating to the coast has outpaced the total U.S. population growth by 15%, growing to over 41 million. Along the East and Gulf coasts, about \$3 trillion in infrastructure adjacent to the shoreline is vulnerable to erosion from flooding and other natural hazards. The 2,300-mile Atlantic coastline contains 170,000 structures within 500 feet of the shoreline. Of these, 53,000 are located within the 60-year erosion

## GENERAL CHALLENGE 4: FLOODPLAIN AND COASTAL ZONE MANAGEMENT

hazard area. Every year approximately 1,500 structures and their land are lost to erosion, costing property owners roughly \$530 million. During this century, 23 hurricanes have caused damages in excess of \$1 billion each (adjusted for inflation). More recently, Hurricane Floyd, a Category 4 hurricane that hit the East Coast in September, 1999, caused damages estimated at \$6 billion and the loss of 75 lives. The coastal states of California, Texas and Florida are each expected to grow in population by more than 36% over the next 25 years. In recent years, these same states have sustained the greatest amount of flood damages. Their concerns, as well as all other coastal areas, include a rising sea level (predicted to rise another two feet over the next 200 years, translating into the loss of 200 feet of beachfront property for every 2-foot

rise), beach erosion, inland flooding, and evacuation gridlock. Over the past 100 years the global sea level rose four to six inches. Records indicate that previous centuries have experienced sea levels rising between a half inch to four inches.

Recently, erosion has become one of the most alarming threats to regional, national and international beaches. The onslaught of global warming is likely to increase the frequency of tropical storms, which tear sand away from beaches. The level of the sea is also expected to rise with warming seas and the melting of the polar ice caps. Cape Cod's oldest lighthouse, the Highland Light, was moved because the Atlantic Ocean had swallowed 400 feet of the lighthouse's front yard since its construction in



*Floodplain management involves keeping some flood prone areas undeveloped to let the river do what it does naturally.*

1797. Erosion on Nantucket's South Shore is at a rate of about fifteen feet per year. At least 25 buildings have either been condemned or destroyed since the 1980's.

### What We Heard at the Listening Sessions

Those attending the Listening Sessions expressed interest in both floodplain management and coastal and shoreline management. Participants endorsed continued use of structural and nonstructural means to reduce flood damages. People noted that flood control structures designed to protect agricultural land are now being used to protect homes and industrial structures. An issue raised consistently across sessions was the need to update flood hazard boundary maps and to identify flood hazards in unmapped areas — especially in expanding cities like Phoenix, AZ — so as to direct development outside these areas. The lack of land use regulation of floodplains -- due to lack of interest, lack of statutory authority, or lack of enforcement -- was highlighted as a widespread problem. Many questioned why the government subsidizes development in the floodplain and proposed that the government instead offer buy-outs to discourage floodplain development. Several people pointed out the need for improved flood monitoring and warning systems. Many attendees highlighted aging flood protection structures that presented risk of failure from lack of maintenance. A few mentioned the challenge of increased storm runoff due to development.

There was near-universal appeal across the sessions for the Federal government to better manage floodway encroachment, discourage future development in the floodplains, examine the implications of unfunded mandates on

states and municipalities and resolve conflicting Federal laws, regulations, and policies. Many people indicated that they believed that the Federal government should promote watershed planning and work for balanced, environmentally sustainable flood solutions within watersheds. As examples people noted that the Federal project planning process should include the consideration of other flood control options such as increased funding for floodplain property buy-outs; development of real-time watershed flood warning systems; and the development of a risk assessment process guideline.

At most of the Listening Sessions, people said that the Federal government should strive to achieve more synergy across agency programs for better floodplain management, prevention, and response. In addition, attendees asked to learn more about the Federal authorization and appropriation processes (e.g., a manual would help). People recommended an integrated Federal-state watershed approach. Participants at most Listening Sessions said that the Federal funding formula needs to be revised to take into account a sponsor's ability to pay. People highlighted the difficulty small communities have in funding projects and suggested that the Federal government should adopt a policy based on a community's ability to pay and the benefits to the Nation for investing Federal dollars.

Discussion about coastal issues focused on beach and shoreline erosion and its effects on national beaches, streams, and rivers. Participants touted the value provided by beaches and shorelines as buffers to protect infrastructure against storm waves; afford habitats for rare and endangered marine-dependent organisms; and provide sites for economically vital tourism. Attendees said that the Federal government should develop a program that restores, nourishes, and monitors beaches. In Atlanta, GA, people discussed the need for sediment management and new strategies for beach replenishment. In Chicago, IL, participants identified poorly planned jetties and seawalls as causes of erosion. Anchorage, AK participants expressed concern for erosion along rivers and coastlines and the effects of a shallow water table on their economy. Woburn, MA, attendees suggested a national policy for coastal protection that considers shoreline protection, environmental resources, flood and erosion control, recreation, protection of open space, and beneficial uses of dredged material.

At several of the Listening Sessions, people said that the Federal government should establish national standards — including technical design, economics and research — for coastal shore protection. Attendees also said that the Federal government should play a significant role in working with states and local governments to coordinate coastal restoration and protection among Federal agencies.



## RESPONDING TO NATURAL DISASTERS

*Plan for, prepare for, and respond to emergencies resulting from natural disasters and technological emergencies.*

In recent years, the United States has experienced major disasters which have had accumulated economic, environmental, and social impacts. The losses include loss of lives; destruction of homes; loss of jobs; business failures; chaos; loss of income and tax revenues; diminished health care systems; public health risks due to unsafe water, lack of sanitation, food shortage, and shelter; transportation delays; and the spread of physical and mental illness. People who are not directly impacted by a disaster are nonetheless impacted when budgets for other government programs are cut because tax dollars are redirected to disaster response, relief, and recovery. Overall, extreme weather events cost the Nation an estimated \$15.8 billion a year. Each disaster declaration represents significant expenditures of public and private funds. In 2000, the Nation suffered losses of 7.3 million acres of forests, homes, and other flora due to fires. From 1987-1997, there were six earthquakes in California with a magnitude of 6.5 or greater resulting in almost \$26 billion in losses. Floods and winter storms cost the U.S. an estimated \$3.4 billion and 150 lives each year. The repetitive nature of damages in many areas of the country illustrates the need for new strategies to effectively mitigate for, respond to, and recover from the many hazards that are prevalent throughout the United States.

The Federal Emergency Management Agency (FEMA) reported an average of 58 major Presidential Disaster Declarations per year from 1986 to 1994. The U.S. sustained 44 weather-related disasters over the past 20 years in which overall damages and costs reached or exceeded \$1 billion per incident. Thirty-eight of these disasters occurred during the 1988-1999 period, with total damages/costs exceeding \$170 billion. In the past ten years, the U.S. has experienced Loma Prieta and Northridge earthquakes in California; record flooding in the Midwest, California, and other regions; hurricanes

Andrew, Inicki, Marilyn, Fran, and Georges, among others; and the spring-summer (2000) fires across the country. In the Atlantic region alone, the period between 1995 and 1999 saw 65 tropical storms, of which 20 were major Category 3-5 hurricanes along the Atlantic coast. The cost of all disasters runs high in terms of environmental, economic, and social impacts: more than 10,000 deaths since 1900 and over \$180 billion in damages just between 1998 and 2000. The National Science and Technology Council estimates that the structural losses from natural disasters averaged \$1 billion a week between August, 1992 and December 1995.

Risks are increasing as the population grows and moves to the coasts and from potential weather calamities from global warming. A highly trained and professional emergency management workforce is an absolute requirement since there is no time for delay or indecision during disasters. The American public expects a ready, willing, and able Federal capability to be prepared to deal with multiple contingencies.



*Earthquakes may require long recovery periods.*



*Volunteers make a difference in preparing for, responding to and recovering from floods.*

Fractionated planning and coordination among key agencies who must work together to perform the readiness requirements under the Federal Response Plan can lead to needless duplication of responsibilities, and work.

Disasters know no national boundaries. In many cases today, countries cannot respond without external assistance. When U.S. assistance is requested and approved, the U.S. Agency for International Development (AID) coordinates the U.S. government response. Increasingly, AID is looking to the Department of Defense to augment international assistance. A recent report by the Subcommittee on Natural Disaster Reduction is looking for new ways to structure international emergency management assistance in preparedness, response, and recovery. Currently, no formal inter-agency "Emergency Support Function" exists to enable the United States to support international planning for natural disasters and operations abroad.



## GENERAL CHALLENGE 5: RESPONDING TO NATURAL DISASTERS

### What We Heard at the Listening Sessions

There was a consistent sentiment expressed across the workshops that there is a need to proactively prepare, coordinate and plan for natural disasters. Those who have suffered the most devastation, such as participants attending the Sacramento, CA session, but also at Dallas, TX, St. Louis, MO, Louisville, KY, and Honolulu, HI, focused on water-related emergencies. Participants emphasized the need for resources to improve stream gauge readings to better monitor potential flood and drought emergencies. In St. Louis, many people suggested a centralized stream gauge operation and standardization of gauge readings. In Phoenix, AZ and Dallas, TX several people wanted the Federal government to better balance water distribution between municipalities during droughts. Some participants wanted all dredged material to be used for the construction of a more substantial levee system. Members of the Coast Guard highlighted an aging fleet for navigation safety.

Attendees called for improved coordination across Federal agencies regarding disaster assistance programs. Regional resources are limited for cleanup of oil spills and other hazardous materials, according to those in Louisville, KY. Emergency managers attending the Sacramento, CA session highlighted a need for improved response capability on the part of the Corps and suggested coordinated funding for both FEMA and the Corps so that recovery operations managed by the Corps are expedited without burden to local resources.

While the U.S. emergency management infrastructure has responded admirably to emergencies, participants at the sessions voiced the need for the Federal government to provide more timely and efficient natural disaster response across Federal, state and local agencies. Another general sentiment expressed was the need for more local involvement and establishment of a proactive approach to

emergency response management. Participants around the country also stated that they would like to see better Federal coordination and planning of response activity and a faster Federal response time to disasters. Basically people called for more general emergency preparedness.

Participants at the Listening Sessions expressed a need for the Federal government to address emergency response in several ways. For example: funding and legislation; issuing general permits (404 permits – Regulating Dredge and Fill Activities Challenge area) so that people can respond effectively and efficiently during emergencies; and improved coordination between Federal agencies to clarify and define to state agencies criteria for who has jurisdiction prior to an emergency.



*Flooding exacts a heavy toll on people's lives and livelihoods.*



*Would preventative measures have saved these houses?*



*There is a need to proactively prepare, coordinate and plan for natural disasters.*

## COMMUNITY WATER INFRASTRUCTURE

*Consider and plan for the implications of aging water resources infrastructure, urban growth and development, and water supply and treatment on a community's ability to be prosperous and sustainable.*

### Growing Needs

The U.S. population and the economy have continued to expand since the 1950s and 1960s when construction of new water resources projects was at a historically high rate. Indeed, over the last thirty years the U.S. population has increased more than 70 million (40%) while the GDP has grown from \$2.5 trillion to \$7.5 trillion. Forecasts over the next twenty years predict that the U.S. population will grow another 50 million (to a total of 325 million). The GDP for 2010 is projected to be around \$12.5 trillion. The projected economic growth clearly will place an increased demand on the performance of the national water resources infrastructure. Yet the recent downward trend

in relative levels of investment explain why there is a growing strain in our infrastructure's capability to reliably support the economic growth that is occurring.

Even though the U.S. population grew by 16% between 1980 and 1995 total water consumption declined by 10% during this same period. However, as populations have been shifting within the Nation, some urban areas have seen significant increases in population and water supply demands. As demand has continued to increase, a number of major U.S. cities and urban regions (e.g., Boston, New York City, Washington, D.C., Atlanta, GA, Dallas, TX, Ft. Worth, South Florida, Southern California, Seattle, and Portland) have experienced



*Clean drinking water is basic for life. The infrastructures of many communities are old and are being tested by growth.*

demands that are near or exceed safe yields of their supplies. Water storage capacity in these cities has not kept pace with water demands. Cities have had to implement water conservation measures during drought periods because of low water supplies in their reservoirs or aquifers. The rate of reservoir storage capacity expansion has declined from a peak of 17.3 million acre-feet per year during 1966-1970 to a rate of 0.8 million acre-feet per year during 1981-1985. There is not much reserve capacity left.

Although Americans have been spending \$59 billion dollars annually for clean water infrastructure, the country will face an annual shortfall of \$23 billion for replacing aging facilities (\$11 billion a year for water systems and \$12 billion a year for wastewater systems) and for complying with Federal water regulations. An EPA survey released in 1997 estimated that drinking water systems would need to invest \$138.4 billion over a 20-year period to ensure the continued provision of safe drinking water. In 2001, the American Society of Civil Engineers (ASCE) graded America's infrastructure and gave drinking water systems a "D" (poor) grade. ASCE noted that 54,000 drinking water systems face an annual shortfall of \$11 billion needed to replace facilities that are nearing the end of their useful life and to comply with Federal water regulations. The total infrastructure needs that ASCE identified amounted to \$1.3 trillion.

As development extends outward from the core, city infrastructure service and maintenance costs increase exponentially. Failure to invest in maintenance, major rehabilitation, and new infrastructure will result in the gradual reduction in our capital water resources stock, and, in turn, the benefits that we can receive from it. This will have repercussions tomorrow in terms



*Investments in urban water systems provide a return on investment to the environment, public health and the economy.*



## GENERAL CHALLENGE 6: COMMUNITY WATER INFRASTRUCTURE

*Water is a key part of smart growth strategies. Water supplies must be capable of supporting desired growth levels*

of sustaining economic growth and the return on the taxpayer's investment in this infrastructure. A reduction in our economic prosperity, quality of life, global competitiveness, and environmental sustainability are likely outcomes if the recent rates of investment in infrastructure continue to fail to keep pace with desired rates of economic growth. Inadequate infrastructure capability will become the constraint in realizing desired economic growth.

Spurring the smart growth movement are demographic shifts, a strong environmental ethic, and increased fiscal concerns. Smart growth recognizes connections between development and quality of life. It leverages new growth to improve the community by investing time, attention, and resources in restoring a sense of community and vitality to center cities and older suburbs. But there is no "one-size-fits-all" solution for growth and development.

Metro areas have grown from 9 to 19% of U.S. land area since 1960. From 1970 to 1990, more than 30,000 square miles (19 million acres) of once rural land in the U.S. became urban. As urbanization continues, amenities associated with urban streams have become more highly valued. Planning and implementation of programs to protect and enhance urban stream corridors for multiple purposes is becoming much more common. Revitalized and restored water-fronts can be a source of community pride and economic development. Restored stream corridors not only enhance urban parks and fish and wildlife habitats, when properly designed they also serve as storm water conveyances and floodways. But run-off from past industrial development has degraded aquatic ecosystems resulting in aesthetic impacts, poor wildlife habitat, and risks to human health and safety.



Many communities are able to conceptualize problems they are having but are often not able to develop strategies to address them.

Communities are faced with making tough decisions with few tools and sparse resources on environmental issues; economical sustainability; quality of life issues related to population growth, land use management, and infrastructure needs; and modernization issues such as water supply and wastewater treatment. Water is a key part of any smart growth strategy. Water supplies must be capable of supporting desired growth levels, agriculture, municipal and industrial (M&I), and infrastructure (such as clean water distribution and wastewater collection systems).

### **Lacking Infrastructure**

Center cities and inner suburbs often have old water distribution and wastewater collection systems. Approximately 900 U.S. cities have combined sanitary and storm sewer collection sys-

tems, which allows for sewage overflows into streams during major storms. Approximately 17 million people in the U.S. are served by facilities that provide less than the required Federal level of secondary treatment. Investments in upgrading such systems must often be made as a precondition for attracting redevelopment and growth. The overall cost of urban water services has increased, particularly since 1985, as costs of developing new supplies and treating water to new quality standards have increased. Inflation-adjusted expenditures for public water supplies by local governments increased by 42% over the period 1985-1995 (3.6% per year). Over that same period, real dollar expenditures for sewer services by local governments increased by 36% (3.2% per year).

Investments in urban water systems (including water treatment plants and wastewater systems) provide a return on investments to the environment, public health, and the economy in terms of preventing billions of tons of pollutants from

## GENERAL CHALLENGE 6: COMMUNITY WATER INFRASTRUCTURE

reaching America's rivers, lakes, and coastlines. Public infrastructure (including water resources infrastructure) investments in 1960 amounted to 3.9% of the Federal budget. Today the figure is more like 2.6%. Of this amount, the share for water resources declined from 1.1% to about 0.2%. Thus, water resources infrastructure investment has declined at a much greater rate than public infrastructure investment as a whole.

Communities across the Nation are concerned that current urban development patterns (urban sprawl) are not in the best interest of our cities, suburbs, small towns, rural communities, or wilderness areas. Infrastructure is being abandoned, creating brownfields, or neglected at an alarming rate. The General Accounting Office (GAO) estimates there are as many as 450,000 brownfields sites in the United States. Communities are questioning the economic costs of abandoning infrastructure in the

city, only to rebuild it further out. People are questioning the wisdom of developing the open space and prime agricultural lands at the suburban fringe, or increasing air polluting of an entire region because urban sprawl forces people to driving farther to get places. People are questioning where their water supplies are going to come from and how their wastewater will be treated. Prosperity and quality of life are definitely on people's minds.



*Over 450,000 industrial sites have been abandoned creating brownfields.*



*Participants called for better planning and infrastructure investment strategies that balance environmental and economic development needs*



### What We Heard at the Listening Sessions

Concerns about the state of the Nation's existing water resources infrastructure were raised at every Listening Session. Participants spoke of environmental, economic, and quality-of-life concerns related to population growth, land use changes, and infrastructure planning and investment. Many people worry that an unreliable and under-performing water resources infrastructure puts property, lives, and livelihoods at risk. A great number of participants were especially concerned about a perceived lack of funding for infrastructure maintenance and new construction. Those in Alaska expressed consternation about the lack of basic infrastructure funding, especially for maintenance in rural communities. Participants at most of the Listening Sessions called for an objective system to prioritize the most vital water resources development needs in the national interest. Some of the attendees recommended addressing the backlog of infrastructure and maintenance over new project authorizations. Those from smaller towns, rural areas, and growing suburbs surrounding larger cities identified a need for funding support to upgrade their aging and deteriorating wastewater systems. Many people called for the Federal government to increase financial assistance for water infrastructure in poor and rural communities. Most observed that the Federal government should consider multi-purpose water resources projects over single-purpose projects.

Many of those attending the Listening Sessions talked about issues related to smart growth and development, water supply, and wastewater collection. People cited aging water supply infrastructure and noted that many communities lack adequate water and sewer systems. In Dallas, TX, people were concerned about the impacts of population growth on existing infrastructure. People also said that the Federal gov-

ernment should assist states and local governments in developing "smart growth" programs that balance protection for the environment, economy, and quality of life. People questioned if there would be sufficient water supply to meet the needs of increasing population and agriculture simultaneously. Attendees cited a need to determine the relative availability, reliability, and accessibility of the water supply. A few expressed the need to clarify water rights among states and even communities. Participants called for better planning and infrastructure investment strategies that balance environmental and economic development needs so as to assure a high quality of life in the future. Some called for strict land use regulation to curb growth. Anchorage, AK participants raised the need for adequate water supplies. Urbanized waterfront issues were paramount in New Brunswick, NJ. In Chicago, IL, a major issue was how to divert water from the Great Lakes for other uses (recreation, commercial shipping) while maintaining an adequate drinking water supply.

People raised concerns about brownfields, highlighting that cleaning up and reusing abandoned properties could help contain urban sprawl and reduce contaminant runoff. Brownfields cleanup was of utmost concern in Anchorage, AK, along with sanitation and water supply in arctic conditions for rural communities and villages. People said that the Federal government should provide funds for buying and cleaning brownfields. Participants identified a variety of water quality issues regarding drinking water, agricultural applications, environmental quality, and recreational uses.

Many people commented on aging or inadequate sewage systems and septic systems operated by cities and towns and about how many

growing communities are operating their wastewater treatment facilities beyond their design levels, leading to maintenance problems and contamination of waterways during peak periods. Combined sewer overflows (CSOs) were cited several times as a significant burden for waste treatment facilities. People recommended replacing CSO systems with systems that would not release sewage into waterways, thus decreasing water quality. Participants from Chicago, IL and Williamsburg, VA stressed a need to replace combined sewer systems with dual systems so as to reduce sewage overflow events, decrease health hazards, and improve water quality. In Woburn, MA people pointed out the inadequacy of the sewer system and problems with sewage overflow and non-point runoff.

Overall, attendees asked for funding support for water and sewer projects in growing areas and for upgrading water and sewer systems. Participants said that the Federal government should fund upgrades to water/sewer systems in older urban areas and fund development in growing areas. People highlighted that water resources planning and management should be integrated with land use planning and management. Attendees said that the Federal government should encourage development practices that minimize environmental impacts. Those from small towns and municipalities cited a need for Federal expertise to identify needs, to seek services for improvements, and to administer programs. In Phoenix, AZ, several people highlighted the enormous backlog of work. Some participants called for creative solutions to water supply issues, such as water marketing, desalinization, and the use of icebergs. Dallas, TX participants noted the need for a long-term funding commitment at all levels of government.

## REGULATING DREDGE AND FILL ACTIVITIES

*Ensure fair, adequate, and efficient permitting to protect wetlands and other waters of the US from development and improper use.*

### Corps Regulatory Program

The Corps regulatory program was discussed at most of the Listening Sessions. Even though we did ask people not to discuss specific Corps projects or programs people did want to talk about the Corps regulatory program (section 404(b) (1) of the Clean Water Act). Because our goal for the Listening Sessions was to identify all water resources challenges, we did not discourage people from discussing it.

The purpose of the Corps' Regulatory Program is to regulate or oversee certain activities in the Nation's waters to protect the quality and availability of those waters for the use and benefit of current and future generations. Activities are regulated through the issuance of Corps' permits. Any person, firm, or agency (including Federal, state, and local government agencies) planning to work in navigable waters of the United States, or discharging dredged or fill material in waters of the United States, including wetlands, must first obtain approval, i.e., a permit, from the Corps of Engineers.

The legislative origins of the program are the Rivers and Harbors Acts of 1890 (superseded) and 1899. Various sections establish permit requirements to prevent unauthorized obstruction or alteration of any navigable water of the United States. The most frequently exercised authority is contained in Section 10 which covers construction, excavation, or deposition of materials in, over, or under such waters, or any work which would affect the course, location, condition, or capacity of those waters.

The Section 404 Regulatory Program is the principal way by which the Federal government protects wetlands and other aquatic environments. The program's goal is to ensure protection of the aquatic environment while allowing for necessary economic development. Section 404 requires Corps' approvals prior to discharging dredged or fill materials into the Nation's waters including wetlands.

### Numerous Permits

The regulatory program is managed at all of the 38 district offices. The basic form of authorization used by Corps districts is the individual permit. Processing such permits involves evaluation of individual, project specific applications in what can be considered three steps: pre-application consultation, formal project review, and decision making. The Corps also evaluates and authorizes other activities through national and regional permits. General Permits and Nation Wide Permits (NWPs) represent over 90% of the permits issued by the Corps. In Fiscal Year 2000 the Corps processed nearly 90,000 section 404 permits. Of these, 90% were approved within 60 days, while 2,500 complex permits required four months or more. The Corps denied 180 permits in Fiscal Year 2000.

A majority of authorized projects are modified and conditioned to protect the aquatic environment and fulfill other public interests while allowing needed economic development.

### Wetlands

In 1987 the Corps issued a Wetland Delineation Manual that defined jurisdictional wetlands. Through the years, virtually all state and Federal agencies have adopted this definition.



*Regulating fill in the Nation's water and wetlands drew many comments at the Listening Sessions – from the need to clarify legislative authority to better enforcement and intergovernmental cooperation.*

The Corps defines jurisdictional wetlands as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions." During FY2000, permits were granted to applicants who requested to fill approximately 18,900 acres of wetlands. In compliance with these Corps permits, applicants were required to create, restore, or enhance more than 44,000 acres of wetland.

### Nationwide Permits

The Corps recently revised its nationwide permit program to better safeguard the aquatic environment while assuring expedited review for projects having minimal impacts.

### Enforcement

In 1972, amendments to the Federal Water Pollution Control Act added what is commonly called Section 404 authority to the program. The Secretary of the Army, acting through the Chief of Engineers, is authorized to issue permits, after notice and opportunity for public hearings, for the discharge of dredged or fill material into waters of the United States at specified disposal sites. Selection of such sites must be in accordance with guidelines developed by the Environmental Protection Agency (EPA) in conjunction with the Secretary of the Army; these

## GENERAL CHALLENGE 7: REGULATING DREDGE AND FILL ACTIVITIES

guidelines are known as the 404(b)(1) Guidelines. The Federal Water Pollution Control Act was further amended in 1977, given the common name of “Clean Water Act,” and was again amended in 1987 to modify criminal and civil penalty provisions and to add an administrative penalty provision. During FY2000 approximately 5,780 violations were filed or reported. Most of those were resolved through voluntary restoration or use of after-the-fact permits. Less than one percent resulted in litigation.



*Section 404 Regulatory Program is a principal way by which the Federal government protects wetlands and other aquatic environments.*

### What We Heard at the Listening Sessions

Participants identified a variety of regulatory issues during the Listening Sessions. The majority of comments addressed the process of obtaining permits. Additional comments were made about regulatory enforcement, regulatory funding, procedural issues, and communication problems. The main permitting issues identified by participants related to the 404 permitting process. A few participants felt the permitting process was structured to accommodate the commercial and industrial sectors. Because of this, many participants stated that communities and the environment were not fairly considered and that the preservation of whole systems, including wetlands, was inadequate.

The majority of those who spoke about the Regulatory Program called for developing greater consistency Corps-wide for both permitting and application reviews to reduce delays, close loopholes, and make the permitting process easier to understand, access, and track. Attendees recommended that increased assistance (e.g. workshops, staff support) be provided to persons submitting permit applications. Participants said that the Corps should

sponsor training workshops on the permit application and permit appeals processes. People definitely wanted more feedback about the status of a permit. For example, people suggested that the Corps develop an Internet system to provide permit status for individual applicants. Participants said that the Federal government should weigh regional differences in the permitting process rather than apply nationwide standards. Those in Phoenix suggested customizing processes for the western and eastern regions of the U.S. because they felt that the current permit structure is designed more for East Coast environments. Participants raised concerns about an insufficient balance between meeting community/environmental needs and commercial/industrial sector needs. People recommended increased funding to support the program, especially for adequate staffing to ensure enforcement. People said that they perceived that violations are going unchecked. In Phoenix and Sacramento, participants called for improved communications between Corps Districts, states and local governments.

One recommendation was to involve Corps Districts, other Federal agencies and State agencies more in permitting decisions.

Attendees said that the Federal government should ensure that permit offices continue to provide assistance to applicants, such as explaining why a particular action was taken and/or proposing alternatives, to participants. Other recommendations were to develop a better process for informing applicants about making information readily available on the Internet.

Participants at the Listening Sessions expressed the need for the Federal government to address regulatory issues in the following ways:

- Grant long-term regulatory permits to local sponsors for their project maintenance responsibilities.
- Develop a database of cumulative impacts of permitted activities.
- Pursue opportunities for general permits for dredging and filling to insure rapid recovery from emergencies.
- Streamline the permitting process by creating a “one-stop” permit source rather than the current multi-agency system.



## RECREATION

*Provide recreation opportunities for all Americans and their guests on National lands and waters.*

### High Use

When it is time for outdoor recreation Americans head for the water. Our many lakes, rivers, and beaches offer everyone fun, fitness, rest and relaxation. Water is the number one recreation attraction in America today, making Federal lakes an irreplaceable public resource. Most of our Nation's outdoor recreation (approximately 75%) is within a mile of streams or another body of water. The importance of recreation to the well being of all Americans is clear. Recreation enriches everyone's lives, strengthens family ties and friendships, and helps children develop personal skills and social values. Americans nearing retirement age often look for communities with ready access to scenic beauty and outdoor recreation. Modern communities and transportation make these places home to increasing numbers of working families as well. An additional way of having fun together, visitors are offered a host of ways to learn about the nature and culture of the area. Many participate in educational programs on topics like water recreation safety, fish and wildlife species, and cultural and historical resources. Children learn to appreciate nature, develop interpersonal skills, and build self-esteem.

Fifty million people fish in the U.S. each year. The Nation's nearly 1,800 Federal lakes host 900 million visits a year. Visitors come to swim, fish, camp, hike, hunt, and view wildlife. Whatever they do, they experience and learn about nature. Over 3 million visitors attend educational programs each year, many of which focus on understanding and appreciating the environment. Each year more than 70,000 Americans volunteer their time and talent to help others enjoy and learn from their visit to a Federal facility.

Recreation promotes economic as well as personal and social well being. It provides jobs and income for individuals and economic stability for communities. Economic development efforts pay off in a big way. During an average year, visitors to Federal parks spend over \$6 billion on things like gas, food, and lodging resulting in over 250,000 jobs. Beyond the local area, \$4 billion in visitor trip spending fuels another 100,000 jobs. Every year purchases of durable goods like boats and campers by Corps visitors also add about \$5 billion to local and regional economies and about 150,000 jobs. In total Americans spend \$15 billion visiting Federal parks and recreation areas each year, resulting in 500,000 jobs.

### Disrepair

Though many regions rely on tourism and outdoor recreation for economic stimulus and employment, numerous recreation areas are degraded and overcrowded. Recreation is an example where new investment is vitally needed. Recreational opportunities abound near reservoirs and dams in places where boating, swimming, and fishing otherwise might not be available. Unfortunately, one-fourth of the Nation's recreation sites at water resources projects are in need of significant modernization. Many of these sites have deteriorated from lack of adequate maintenance to the point where they have health and safety concerns; others are undersized for contemporary outdoor recreation equipment, or do not support the diversity of outdoor recreation pursuits of our multi-cultural society. Some recreation sites are being destroyed by overuse. Many visitors are greeted with long waiting lines at boat ramps and campgrounds. Changing use patterns – both in terms of different ethnic groups and different and more modernized recreation-



*Over 3 million visitors attend educational programs each year, many of which focus on understanding and appreciating the environment.*

al equipment – are making new demands on recreational facilities. Visitors are bringing larger and more complex boats and camping equipment to lakes.

While public usage of Federal recreation sites has increased, funding levels for the operation and maintenance of recreation areas has remained level in constant dollars. The current backlog of deferred maintenance at Federal sites now exceeds \$800 million. Many recreation facilities have outlived their useful life and are beyond repair; other areas are out of step with modern needs. Still other sites have been over used, resulting in adverse impacts on natural resources and the level of service visitors come to expect. Insufficient vehicle access control and inadequate parking impact land resources. Most recreational facilities were built in the 1960s and do not meet the needs of people today. On some lakes, the quality of aquatic resources is impacted by soil erosion due to heavy use, outdated design, and insufficient impact resistant areas around recreation facilities. These aquatic resources are critical in supporting a nationally significant sport fishery.

### Conflicting Priorities

There are growing conflicts between recreational uses of waterways and the marine transportation system. Both recreation and commerce have increased on waterways, causing congestion and potential safety issues.



## GENERAL CHALLENGE 8: RECREATION

### What We Heard at the Listening Sessions

A large portion of the Nation's water resources is used for recreation. Many water resources projects incorporate recreation use into project planning. One common example is the use of reservoirs for water recreation. This multi-purpose approach to projects has allowed for a large increase in recreational opportunities. Participants in Vancouver, WA discussed the management of dams and the effects they have on recreation. People in St. Louis talked about construction of wetlands and parks along waterways to benefit bird watchers and mitigate flooding.

Recreation is often considered as a secondary benefit to a project purpose. As such, participants did not feel the proper level of priority has been given for recreation. In Louisville, KY, Vancouver, WA, St. Louis, MO, and especially Washington, D.C., many participants stated that recreation should be treated as a primary

project purpose, co-equal with other project purposes. Participants called for making recreational use a legitimate primary project purpose on all Federal projects. People also discussed the need for Federal agencies to collaborate and reevaluate guidelines, principles, and criteria under which projects are justified and take in to account the value of recreation.

Both recreational use and waterborne commerce on waterways have increased over time, causing congestion and potential safety issues. Participants voiced a need for better waterway management to allow for efficient commerce and safe recreational use. In Louisville, KY, Vancouver, WA, St. Louis, MO, and especially Washington, D.C., participants acknowledged the growing conflict between recreational and commercial users of waterways. Participants voiced a need for better waterway management to allow for efficient commerce and safe

recreational use in the face of increasing congestion and potential safety issues. People in Louisville, KY indicated that a licensing program for recreational users should be implemented.

Some participants stressed the need for additional funding for adequate operation and maintenance of recreation facilities. People gave examples of numerous recreational areas that are degraded and overcrowded, with little being done to resolve the issue. Attendees pointed out that many regions rely on tourism and outdoor recreation to provide revenue (jobs). With this in mind, proper funding and management of recreation areas is crucial to the success of these activities. At the Washington, D.C. workshop people recommended increased education, communication and coordination about recreational use of waterways.



*Participants voiced a need for better waterway management to allow for efficient commerce and safe recreational use.*



*This reservoir provides a recreational beach for residents of Coralville, Iowa.*

## PROJECT PROCESSES

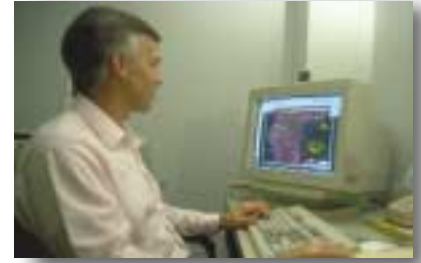
*Ensure significant communication, information, public input, and analysis for successful project development.*

The development and management of a Federal water resources project is guided and regulated by numerous laws, policies, technical standards, and other requirements. By law, potential projects must pass through an investment analysis to determine whether Federal monies to be provided for a potential project represent a sound investment of taxpayer resources. During 1983, the President approved the "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies" better known as Principles and Guidelines or P&G. Under these Federal rules, the Federal objective of water resources project planning is to contribute to National Economic Development (NED), consistent with protecting the Nation's environment. The P&G defines at least four basic accounts. They are national economic development (NED); environmental quality (EQ); regional development (RD); and social well being (SWB). However, the P&G makes mandatory only the NED account. With passage of the 1986 Water Resources Development Act (WRDA), virtually all water resources projects are required to have a cost-sharing partner.

A project evolves from the identification of a problem all the way through to a functioning solution that reflects the Nation's interests and the interests of those impacted by the project. Each potential project passes through several key phases once a water resources problem or need has been identified. These phases include obtaining necessary congressional authorization and appropriations for Federal involvement; local cost sharing agreements; formulation and evaluation of appropriate solutions; authorization/approval of the project; design and construction of the project; and finally, operation and upkeep of the completed project. Prior to passage of Water Resources Development Act (WRDA) in 1986, it took

Federal agencies up to 20 years for projects to go from initiation of the feasibility study through construction. With the passage of WRDA 1986, the Federal process was shortened significantly. As of 1996, it took the Corps up to 9 years for projects to go from initiation of the feasibility study through construction.

Until recently both Federal and state involvement in water resources projects have been on a project-by-project basis. This piecemeal approach can be time-consuming and inefficient. In response to this problem, Federal agencies now favor managing watersheds holistically and are beginning to collaborate together with the idea that they will be able to build models of watersheds jointly. With recent passage of laws such as WRDA 2000, definitions of watershed studies have been broadened to a more holistic definition. Federal agencies see this as a tool for being able to complete the



*Participants saw the need for better partnering during data collection, studies, and monitoring programs.*

project development process efficiently and effectively. Since most Federal agencies prefer to use the holistic watershed approach as defined in WRDA 2000, it may now be time to re-examine study methodologies, especially economic principles and guidelines for cost-benefit studies.

The more communication there is the better the project development process will be understood and the conclusions of the process accepted. Many times this requires an education process between and among all parties. Communication and exchange of data are needed as part of the project development process so that people can make the best and most informed decisions. During each phase, public and interagency coordination occurs.



*Stakeholders must be part of the project development process so that the best and most informed decisions can be made.*

## GENERAL CHALLENGE 9: PROJECT PROCESSES

### What We Heard at the Listening Sessions

We heard three basic themes pertaining to the project process challenge: need for improving efficiency of project development processes; need for improving communication, education, and coordination; and a need for improved project evaluation processes.

One of the main concerns that resounded among all attendees was the need to deliver projects faster by reducing the time lag between concept and construction. People felt that the time to move a project from conception to construction is a barrier for non-Federal sponsors. Some participants stated that the current decision-making process is too slow and needs to be significantly accelerated. Several participants felt that there is a need to reduce the amount of time it takes to get project approvals by “higher officials.” Attendees at Woburn, MA; Williamsburg, VA; Vancouver, WA and Dallas, TX said that the extended time required for approval of improvement projects puts ports and harbors in a disadvantaged position to respond to rapidly changing global trends.

The need to improve sponsor communication, education and involvement from a project’s beginning was a dominant theme identified by participants. Attendees emphasized full stakeholder involvement from a project’s beginning at all of the Listening Sessions. People stated that government agencies do not adequately coordinate efforts between agencies nor do they adequately involve stakeholders in project planning and decision-making. Participants said that this could be avoided if agencies would provide efficient processes that incorporate

stakeholder inputs early on. In this way, environmental groups and other stakeholders felt that they would more likely be included from the beginning, rather than being left to challenge projects later during the public review process of the project selection phase.

Related to this concern, Woburn participants voiced issues pertaining to information sharing and the development of updated data using “good science.” Participants at the Listening Sessions voiced concerns about the lack of data sharing between agencies, non-governmental organizations, and stakeholders. People said that the lack of communication and coordination was causing overlaps in studies and inefficient utilization of resources and funds. Participants saw the need for better partnering during data collection, studies, and monitoring programs. Many people stated that good communication and data sharing, along with a centralized location for data storage and access, is important--if not essential. One option would be to form a large clearinghouse for data retrieval that could be readily accessible by any interested person. The ideal solution would be to have a “one-stop-shop” for all agencies to provide and share information among each other.

Some participants felt that the Federal government should stay with projects after they have been built, rather than hand them off to others to operate and manage. Participants from the Sacramento workshop wanted to see a reduction in the time and cost needed to implement flood control operations and maintenance (O&M).

Participants at most of the Listening Sessions generally felt that there should be more flexibility in, criteria and standards for evaluating potential projects. People said that the Federal government should include due consideration of economic, social, and environmental benefits during project formulation. For example, participants said that the Federal government should incorporate environmental sustainability principles into project development processes. People also stated that they believe a role for the Federal government is to develop consistent interpretation of National Economic Development (NED) benefits. Participants also recommended redefining the NED benefits of projects to include and account for all environmental benefits and other social need benefits.

Participants at the sessions also felt additional training of agency personnel and education of the general public on water resources issues were required. Attendees commented that agencies tend to focus on their specific roles and seem to neglect to learn about other roles and issues. Participants recommended multi-agency workshops be held to educate agency personnel. Furthermore, participants felt the general public also needed additional education on the complexities and importance of water resources economic, social and environmental issues. This would give citizens a better understanding of why various projects are conducted the way they are and at the same time increase the probability that the public would accept these projects thus speeding up the project development process.

*Participants felt the general public also needed additional education on the complexities and importance of water resources economic, social and environmental issues.*





## INSTITUTIONAL CHANGES

*Streamline and improve Federal water resources authorities, laws, policies, and funding to better align the Federal government's priorities, goals and objectives.*

### Multiple Agencies

Taxpayers, Congress, and the Administration expect government agencies to provide valuable services in return for the investment of taxpayer dollars. Water resources projects and services produced with taxpayer funds fulfill that expectation by making major contributions to the Nation's economic prosperity, global competitiveness, quality of life and environmental sustainability.

The Federal government's water resources development and management program began in 1824. At that time, Congress appropriated funds for improving navigation. Since then, the Federal government has been involved in improving navigation in rivers and harbors, reducing flood damages, restoring degraded ecosystems, managing national parks, water

supply, regulation, and more. Many water resources projects designed for these missions also generate secondary benefits like hydroelectric power; water supply for municipalities, industries; and outdoor recreation.

There are currently 34 Federal agencies involved in one or more of the major areas of water resources challenges. Until recently, there was little or no collaboration across agencies. As part of the Clean Water Action Plan, eight Federal agencies signed the Unified Federal Policy for Ensuring a Watershed Approach, during August and September 2000. Although Federal agencies prefer and encourage watershed approaches they lack resources to conduct or complete watershed studies on their own. Nonetheless agencies have pledged to share resources and data, educate each other and the public, and promote dialogue with various publics. There remains an ever-growing need to review existing Federal water resources policies to make sure they are current and are being properly implemented by all respective Federal agencies.

### Cost Sharing Hurdles

The case for Federal investment is compelling. Needs are large and unprecedented. In many locations, local sponsors cannot, and should not, be expected to meet water resources challenges alone. Project cost-sharing requirements prevents poor or rural communities from getting their water resources needs met. Because waters are shared across local and state boundaries, the benefits of Federal help will accrue to the entire Nation. Some communities meeting the government's criteria did not get projects built because they lacked funds for cost-sharing during design and construction phases. Some small communities also lack the required technical expertise to participate as project sponsors. Clean and safe water is no less a national priority than are national defense, an adequate sys-



tem of interstate highways, or a safe and efficient aviation system.

National investment in water resources projects has not kept pace with our level of economic and social expansion. Public infrastructure investments in 1960 amounted to 3.9% of the Gross Domestic Product (GDP). Today the figure is more like 2.6% of the GDP. According to a report from the Water Infrastructure Network (WIN), communities face staggering infrastructure funding needs – nearly a trillion dollars – over the next 20 years, with a projected shortfall of \$500 billion. As a result many water resources needs may remain unmet.

### Local Burdens

Most Federal water resources projects are authorized by a Water Resources Development Act (WRDA). The purpose of a WRDA is to authorize the expenditure of Federal funds when the funds become available. The annual appropriation process normally determines availability of funds. Sometimes funds aren't available for many years after a WRDA has been signed into law. Currently Federal agencies budget annually and plan for projects based on priorities and ceilings set by either the administration or Congress or both. Project completion dates have been extended frequently due to Federal funding ceilings and shortfalls. This has resulted in inflated project costs and increased cost sharing burdens for our sponsors. Projects that could be constructed in a short period of time have been broken into multiple contracts and constructed over several years so ceilings aren't exceeded. The consequence of this process is that sponsors are not able to realize full benefits of projects until many years later than promised. Ceilings have contributed to more than \$22 billion construction backlog of authorized water resources projects.



### What We Heard at the Listening Sessions

Participants expressed similar views across all workshops with regard to national policies and how the Federal government should fund water resources projects. Participants demanded better coordination between agencies to reduce policy overlaps and conflicts. Attendees also want the Federal government to increase interaction and communication with stakeholders. People advocated policy modifications to address changing water resources issues and social conditions or to address a perceived failure of current policies. People recommended that agencies periodically and collaboratively review existing Federal water resources policies to make sure they are current and are being properly implemented. To help with this, people said that the Federal government should consider funding a national group such as the Water Resources Council to coordinate water resources policy. Attendees also said that Congress should develop watershed or river basin commissions to coordinate basin activity.

Attendees said that the Federal government should encourage multi-objective approaches and fund pilot holistic watershed management studies at full Federal expense. Participants elaborated that using a holistic watershed approach would assist problem solving and help identify both problems and solutions. At a minimum – or in addition to holistic watershed studies – people said that the Federal government should conduct a gap analysis of all water resources across the entire Nation. Participants at most of the sessions felt that the Federal government should expand its role in areas such as recreation, water supply, shoreline protection, environmental restoration, and water quality by introducing new legislation aimed at reducing the gap between water resources needs and infrastructure investments. In addition, the overlap and possible conflict of policies at agencies was a commonly voiced concern. St. Louis participants stated that agen-

cies should collaborate more closely, while others believed that water resources mission areas should be abolished at several agencies and a new combined agency created.

Many participants commented on specific aspects of Federal policy. Some St. Louis participants felt that the Federal government needs to better address environmental issues. Participants at the Sacramento, California; Chicago, Illinois; New Brunswick, New Jersey; and Woburn, Massachusetts felt that more emphasis needs to be placed on shoreline protection. Participants in Honolulu believed that Federal policies should recognize the unique ecological and cultural setting of the islands. Some participants felt that Federal agencies should be allowed to provide technical assistance for local projects that do not support traditional Federal policies or missions.

Concerns about funding were raised at every workshop. At issue was the cost sharing formulas associated with funding water resources projects. People said that the current cost-sharing formula for funding projects was unfavorable for local sponsors in small communities. Participants said that the Federal government should develop policies sensitive to a community's ability to cost share. People pointed out that those living in rural areas did not have funds necessary to be a cost-sharing partner. Attendees felt that only large communities that have a large tax base and who have influence in Congress could afford to cost share studies or projects.

Participants at most of the Listening Sessions recommended that the cost-sharing formula be revised to allow the locally recommended or preferred plan to be cost shared at the same rate as the projects recommended plan even if the locally preferred plan costs more. At the Sacramento Listening Session, participants sug-

gested establishing a cost-sharing formula based on a locally preferred plan because the locally preferred plans are often more in line with local planning objectives. Generally, attendees concurred that cost-benefit analysis guidelines should be re-written because they are too restrictive and thus exclude too many benefits. Participants, in general, agreed that projects should take into account all benefits relating to social, cultural, and environmental values when determining whether a project should be recommended.

A concern for many participants was insufficient funding that is appropriated to replace aging infrastructure, operate and maintain current projects, and construct authorized projects. A commonly expressed concern focused on the large backlog of projects that have been authorized for construction. Attendees said that the Federal government should reduce construction backlogs of authorized water resources projects and justified maintenance. Participants at all of the workshops stated that an increased level of funding is needed to implement projects. Several attendees indicated that capital projects should be fully funded over the project term. People also commented that this would speed up project completion times and eliminate cost increases due to inflation as well as allow communities to maximize project benefits. To accomplish these goals participants said instead of funding individual programs, fund all water resources programs using a "water resources appropriation bill." Because Federal funding affects practically all water resources challenges, regional funding issues varied according to regional needs. Federal funding was identified as a challenge more often in Williamsburg, VA; Sacramento, CA; Phoenix, AZ; and Omaha, NE. It was also voted as one of the more important challenges at both of the national sessions.











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