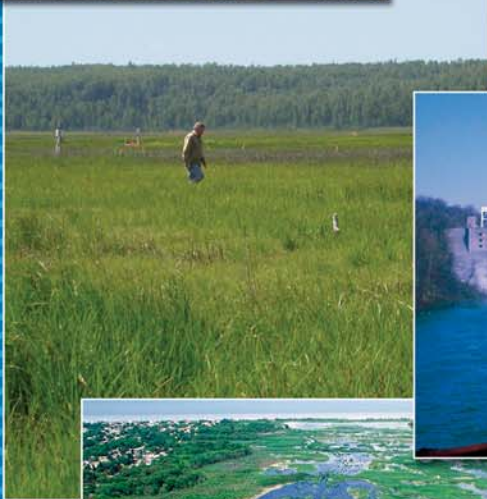


SUSTAINABLE SOLUTIONS To America's Water Resources Needs

Department of the Army
Corps of Engineers

Civil Works Strategic
Plan 2011–2015



US Army Corps of Engineers®

September 2011



PLAN AT A GLANCE

VISION

Contribute to the strength of the Nation through innovative and environmentally sustainable solutions to the Nation's water resources challenges.

MISSION

Serve the public by providing the Nation with quality and responsive:

- Development and management of the Nation's water resources;
- Support marine transportation systems for commercial navigation;
- Protection and management of the natural environment;
- Restoration of aquatic ecosystems;
- Flood risk management and emergency management; and
- Engineering and technical services in an environmentally sustainable, economic, and technically sound manner with a focus on public safety and collaborative partnerships.

GOALS

How We Accomplish Our Mission

- 1. Assist in providing for safe and resilient communities and infrastructure.*
- 2. Help facilitate commercial navigation in an environmentally and economically sustainable fashion.*
- 3. Restore degraded aquatic ecosystems and prevent future environmental losses.*
- 4. Implement effective, reliable, and adaptive life-cycle performance management of infrastructure.*
- 5. Build and sustain a high quality, highly dedicated workforce.*

ACHIEVING THE GOALS

To accomplish the Mission and translate the Vision into reality, USACE will apply an overarching strategy of Integrated Water Resources Management (IWRM) that embraces holistic and collaborative planning. This overarching strategy is supported by a series of cross-cutting operational strategies or methods that operationalize the qualities of a technically competent and forward looking organization. To ensure we are achieving our overarching strategy, this strategic plan articulates five goals that will guide USACE into a 21st Century organization.

In response to Hurricanes Katrina and Rita, Goal 1 explicitly includes the concepts of safety and resiliency, and the intent to reduce both economic and human life losses from natural and manmade disasters. Goal 2 includes the USACE navigation program, which provides safe, reliable, highly cost-effective, and environmentally sustainable waterborne transportation systems for the movement of commercial goods and for national security needs. Goal 3 focuses on restoring aquatic habitat to a more natural condition in those ecosystems whose structures, functions, and dynamic processes have become degraded. Goal 4 emphasizes adaptive operation and management of existing USACE projects throughout their entire life cycle. Reliability is also a part of this goal, and this reflects the increased implementation of risk-based asset management in the area of operations and maintenance of USACE infrastructure. Finally, Goal 5 focuses on technical excellence to encompass all aspects of a competent team, including tools to attract and maintain a high-quality work force.

OVERARCHING STRATEGY

Integrated Water Resources Management – A holistic focus on water resource challenges and opportunities that reflects coordinated development and management of water, land and related resources. IWRM maximizes economic services and environmental quality and ensures public safety, while providing for the sustainability of vital ecosystems.

CROSS-CUTTING STRATEGIES

Systems Approach – Water resources planning and management should be watershed in scale using systems analysis methods and tools to understand, assess, and model the interconnected nature of hydrologic systems (e.g., watersheds) and the economic and ecologic systems they support, and to identify and evaluate management alternatives from both time (life-cycle) and function (multi-purpose) perspectives.

Collaboration and Partnering – Build and sustain collaboration and partnerships at all levels to leverage authorities, funding, talent, data, and research from multiple agencies and organizations.

Risk-Informed Decision Making and Communication – Develop and employ risk and reliability-based approaches that incorporate consequence analysis, especially risk to humans; identify, evaluate, and forestall possible failure mechanisms; and quantify and communicate residual risk.

Innovative Financing – Think beyond traditional government appropriations and seek innovative arrangements such as public-private partnerships, revised funding prioritizations, and other appropriate funding mechanisms to develop and sustain the Nation's water resources infrastructure.

Adaptive Management – Adaptive management is a decision process that promotes flexible decision making that can be adjusted in the face of risks and uncertainties—such as those presented by climate change—as outcomes from management actions and other events become better understood through monitoring and improved knowledge.

State-of-the-Art Technology – Embrace new and emerging technology for its fullest advantage. Invest in research that improves the resiliency of structures, assists in updating design criteria, and improves approaches toward planning and design.

FOREWORD



For more than 230 years, the U.S. Army Corps of Engineers (USACE) has been a leader in public engineering as exemplified through the development and management of water resources in the United States in which there is a federal interest. As USACE moves through the 21st Century, it will continue to advance the Civil Works Program strategic goals: assisting in providing for safe and resilient communities and infrastructure; helping facilitate commercial navigation in an environmentally and economically sustainable fashion; restoring degraded aquatic ecosystems and preventing future environmental losses; and implementing effective, reliable, and adaptive life-cycle performance management of infrastructure, all delivered through a competent team. USACE is committed to innovative approaches to sustain its credibility and capability to serve the Army and Nation with excellence and relevance.

As society's needs and values have changed, the U.S. Army Corps of Engineers Civil Works mission has evolved from one of primarily development and management of water resources to one that inherently includes protection and restoration of water resources and the ecosystems they support. USACE has implemented water resources and marine transportation programs and projects that strengthen America's economic competitiveness; reduce risks from floods and hurricanes; help people recover more quickly from disasters; provide American homes and communities with water and power; provide recreational opportunities and natural resources for citizens to enjoy and appreciate; and restore, protect and sustain the natural environment, including wetlands and associated aquatic ecosystems.

A particular strength of USACE is the synergy between its civil and military operations. Beyond the direct contribution that the Civil Works Program makes to domestic economic development and environmental security, USACE also applies its Civil Works expertise to support defense missions, such as operations that

promote peace and stability around the globe. In turn, the Civil Works team derives increased depth and broader experiences from operations in international areas by being an integral part of the larger Army and Defense organizations. USACE has demonstrated this synergy most recently in post-conflict stability operations in Afghanistan and Iraq and post-disaster response operations following Hurricane Katrina.

New strategies are needed to successfully achieve our goals. USACE must operate and manage existing water infrastructure in a sustainable manner that not only meets the Nation's contemporary water resources needs, but also adapts to changing conditions such as climate change and demographic shifts to ensure such resources are available for future generations. Competing water uses must be balanced to provide multiple benefits such as economic security, environmental health, social well-being, and public safety. For example, navigation projects must be designed and operated to not only safely and efficiently convey vessels and cargo to ports and waterways, but do so in an environmentally responsible manner. Flood risk management projects must simultaneously reduce flood risks and sustain healthy ecosystems.

Today, the complexity of water resources development and management requires closer partnerships and greater collaboration. The development of federal, state, local and private partnerships, along with increased stakeholder and non-governmental collaboration is essential to achieve the most efficient and sustainable solutions. Transparency within USACE activities is a key component in achieving this collaboration. A vital new overarching strategy to deal with these complex and changing conditions will be adopted. This strategy is Integrated Water Resources Management (IWRM), which seeks to foster equitable, efficient management and sustainable use of water. IWRM promotes the coordinated development and management of water, land, and related resources to maximize economic and

social welfare without compromising the sustainability of vital ecosystems. Such integration is essential for the future success of the Civil Works program given the Nation’s multi-layered governance system that crosses watershed boundaries and the interdependent relationship between the natural and built environment. This strategy will address key external forces such as climate change, demographic and associated land use changes, and resource constraints and focus on implementation of innovative and resilient solutions to the Nation’s water resources planning and management needs.

Responsible water resources engineering is not just the application of state-of-the-art science and technical skills. This strategic plan recognizes that USACE must continually develop and apply a diverse range of planning, problem solving, and evaluation strategies while broadening its knowledge, skills, and talents. The USACE must be both a leader and a partner in these efforts. This strategic plan presents USACE’s commitment to responsibly develop the Nation’s water resources, while protecting, restoring and sustaining environmental quality. USACE is dedicated to learning from the past and adapting the organization to ensure the U.S. enjoys a prosperous and sustainable future.

Building Strong!

Jo-Ellen Darcy
Assistant Secretary of the Army for Civil Works

Meredith “Bo” Temple
Major General, USA
Acting Chief of Engineers





TABLE OF CONTENTS



Plan at a Glance	2
Foreword	4
Introduction	8
Vision and Mission	9
Organization Chart	10
Addressing an Uncertain Future	11
Overarching and Cross-Cutting Strategies	15
Strategic Goals and Objectives	18
Program Evaluation	26
Conclusion	27
References	27

INTRODUCTION



Water is the focus of the U. S. Army Corps of Engineers (USACE) Civil Works Program. For over 230 years, USACE has been entrusted with the development and stewardship of much of the Nation's public water resources. The USACE Civil Works Program plans and manages water for transportation, recreation, energy, wildlife habitat, aquatic ecosystems, and water supply, while reducing the impacts of flood damages and other natural disasters.



The 21st Century has brought increasing pressure on the Nation's water resources. Competition and conflicts over water resources are likely to increase and intensify as population grows and climate change increases variability in precipitation patterns. Regional reductions in the natural storage provided by snow pack, drought, and increased frequency of severe storms are among the anticipated futures.

As water resource problems increase in scale, scope, and complexity, new and innovative solutions must evolve, if USACE is to be effective. To this end, the Civil Works Strategic Plan builds on the "Watershed Approach" introduced in the 2004 Strategic Plan that emphasized a systems focus on water resources planning and collaborative problem solving. Such an approach seeks to balance economic, environmental, and social objectives, while increasing active partnering with others. It requires the involvement of all stakeholders.

Strategically, the USACE "Campaign Plan" describes the vision and goals for the entire organization. The Campaign Plan incorporates the goals of the Civil Works, Military Construction, Real Estate, and Research and Development programs and shows how these are mutually supportive. The desired outcomes of the Campaign Plan are described by the following four goals.

Goal 1. Deliver USACE support to combat, stability, and disaster operations through forward deployed and reachback capabilities

Goal 2. Deliver enduring and essential water resource solutions through collaboration with partners and stakeholders

Goal 3. Deliver innovative, resilient, sustainable solutions to the armed forces and the Nation

Goal 4. Build and cultivate a competent, disciplined, and resilient team, equipped to deliver high quality solutions

The Civil Works program is aligned with and contributes to all four Campaign Plan goals. These goals provide direction toward the accomplishment of the Civil Works Program Strategic Goals.

With each new strategic planning cycle, the Civil Works Strategic Plan evolves. Significant forces that shaped this Strategic Plan include a greater recognition of public safety, the natural environment, ecosystem restoration, and collaborative partnerships in the Civil Works business. These factors and other experiences also prompted changes in the 2004 Civil Works Strategic Goals. Public safety was explicitly added to Goal 1, along with the concept of resilience. The concept of sustainability was incorporated into Goal 2, reflecting the overarching strategy of Integrated Water Resources Management. The concepts of reliability, adaptability, and life-cycle project performance were specified in Goal 4. Finally, Goal 5 was broadened from an engineering organization focus to also encompass all aspects of an interdisciplinary, competent team, including the development of competencies that will be needed in the future.

Another element that distinguishes this Civil Works Strategic Plan from previous versions is the introduction of a set of Cross-Cutting strategies that apply to all goals, and across a wide range of future conditions. These cross-cutting strategies were derived from a scenario-based strategic planning process.

VISION AND MISSION



The USACE Vision - *Contribute to the strength of the Nation through innovative and environmentally sustainable solutions to the Nation's water resources challenges.*

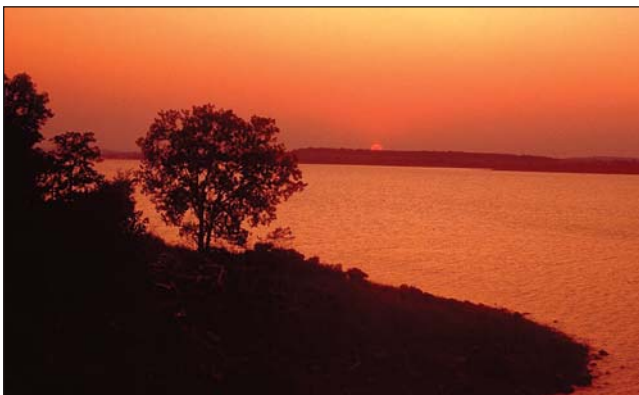
The Civil Works Mission - *Serve the public by providing the Nation with quality and responsive:*

- *Development and management of the Nation's water resources;*
- *Support marine transportation systems for commercial navigation;*
- *Protection and management of the natural environment;*
- *Restoration of aquatic ecosystems;*
- *Flood risk management and emergency management; and*
- *Engineering and technical services in an environmentally sustainable, economic, and technically sound manner with a focus on public safety and collaborative partnerships.*

Strategic Goals

This Civil Works mission is accomplished through the accomplishment of five goals.

1. *Assist in providing for safe and resilient communities and infrastructure.*
2. *Help facilitate commercial navigation in an environmentally and economically sustainable fashion.*
3. *Restore degraded aquatic ecosystems and prevent future environmental losses.*
4. *Implement effective, reliable, and adaptive life-cycle performance management of infrastructure.*
5. *Build and sustain a high quality, highly dedicated workforce.*



To achieve these goals, the Civil Works program is implemented through nine business areas representing the diversity of the Nation's resource requirements.

- Navigation
- Flood and Coastal Storm Damage Reduction
- Environment
- Hydropower
- Regulatory
- Recreation
- Emergency Management
- Water Supply
- Support for Others

While these business areas provide a framework for executing the Civil Works program and this Strategic Plan, the associated Civil Works activities transcend individual business programs and often produce multiple water resource benefits for the Nation. Consequently, close coordination between the business programs is required to deliver quality, timely products and services as well as achieve the Civil Works Strategic Goals. The nine business program managers continually seek comprehensive, collaborative, and sustainable solutions that often involve multiple business programs. A description of what the Civil Works Program does is provided in the text box on page 10.

Organization

The U.S. Army Corps of Engineers (USACE) is an executive branch agency within the Department of Defense and a Major Command within the Army. The USACE consists of four program areas that include civil works, military construction, real estate, and research and development. The entire organization employs approximately 37,000 people, including approximately 765 Army officers, noncommissioned officers, and enlisted soldiers. Approximately 24,000 civilian employees work within the civil works area.

With the appointment of the first Chief Engineer in 1775, the USACE has a long history and is today one of the world's largest public engineering, design, and construction management agencies. It leverages its expertise through contracts with civilian companies for all construction work and much of its design work.

The USACE organization consists of a Headquarters located in Washington, D.C., nine Major Subordinate Commands (MSCs), and 46 Districts, 38 of which carry out civil works responsibilities in the United States, and 6 specialized centers. Most of the MSC and District geographic boundaries are aligned with watershed boundaries. There are also several world-renowned research and development laboratories and other offices contributing to the USACE mission.

The USACE Civil Works program is funded primarily through Energy and Water Development appropriations. The leadership is provided by a civilian Assistant Secretary of the Army for Civil Works who is charged with responsibility for overall policy direction and oversight for all aspects of the Civil Works mission. An Army officer serves as the Chief of Engineers to oversee execution of both the civil and military programs. The Chief of Engineers delegates authority for the leadership and management of the Civil Works program to the Deputy Commanding General for Civil and Emergency Operations and to the civilian Director of Civil Works.

- ### What the Civil Works Program Does
- Provides safe and reliable commercial waterways;
 - Reduces risk to people, homes, and communities from flooding and coastal storms;
 - Restores and protects wetlands and other aquatic ecosystems;
 - Generates hydroelectric power for distribution to communities;
 - Provides educational and recreational opportunities;
 - Prepares for natural disasters and acts when disaster strikes;
 - Supplies water storage for municipal and industrial use; and
 - Assists in the clean-up of contaminated land

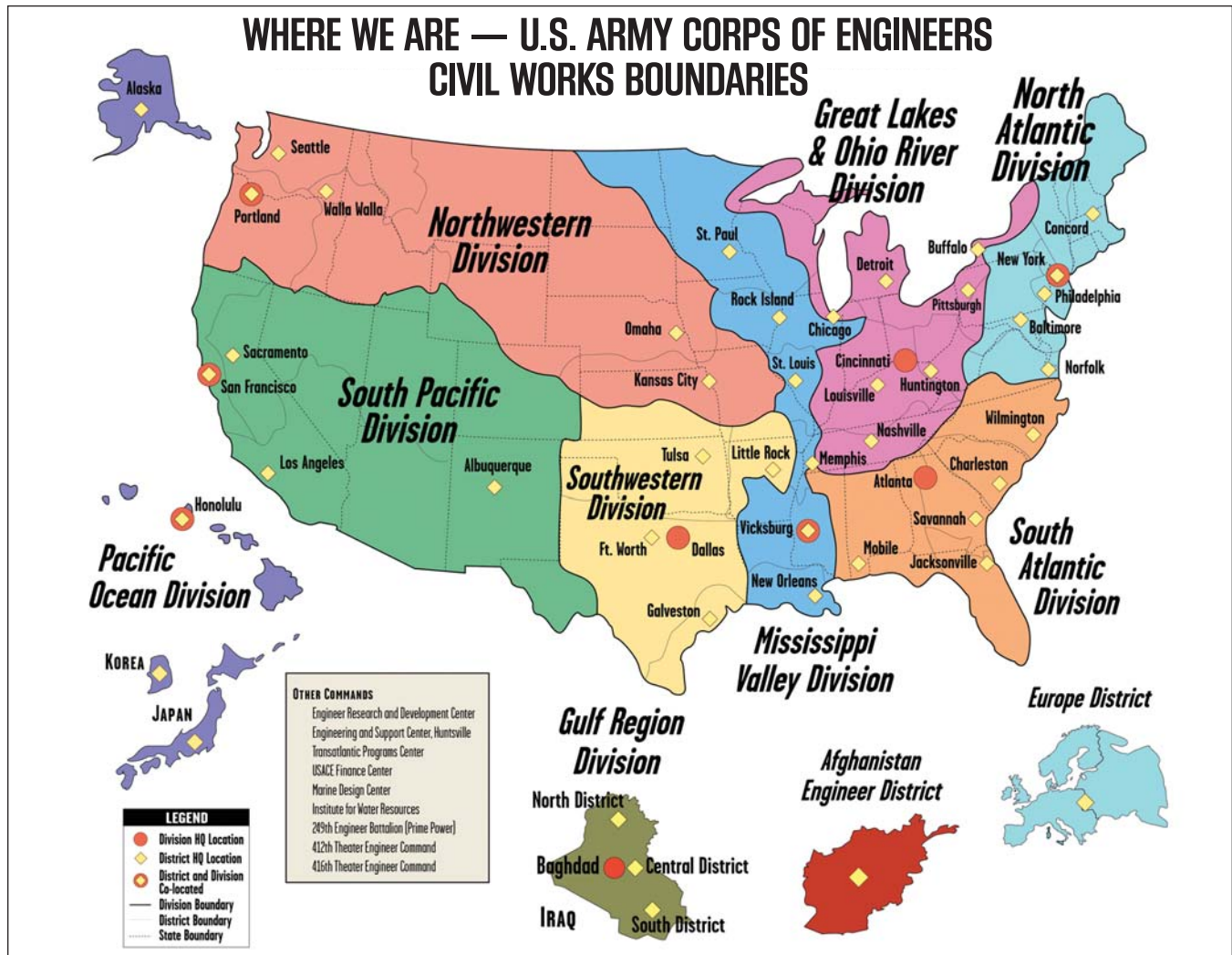


Figure 1. Organization Chart



Over the past several years, a number of external factors have emerged that are impacting the Nation and the USACE Civil Works Program now and in the future. Of particular importance are: global climate change; an increase in the frequency of floods and droughts; demographic changes that increase both competition for water and the numbers of people and property at risk from natural hazards; and contingency operations and associated stability operations throughout the world. Recent experiences, Hurricane Katrina in particular, have significantly influenced how USACE applies its engineering expertise, interacts with the public served, and partners at the federal, state, and local levels.

These external forces will also require the strengthening of USACE's core competencies and the addition of new capabilities. Some fields which are likely to be needed more in the future are systems engineering, geotechnology, ecosystem restoration, climatology, hydrology and hydraulics, risk management, and financial management. In general, the ability to adapt to new processes and new technologies will be a key skill. The challenges of an uncertain future will require people with strong communication, problem solving, and collaboration skills as well as excellent technical skills.

The key external forces or drivers most likely to influence the Civil Works Program in the future are discussed below.

Demographic Shifts and Growth

Trends in birth, death, and migration are changing the absolute and relative size of young and old, rural and urban, and ethnic populations.

UNITED STATES

- **More people**

U.S. population will continue to increase from 310 million in 2011 to 440 million people in the year 2050. While much of this population growth will be caused by immigration, the total growth will increase demands on all areas of water resources.

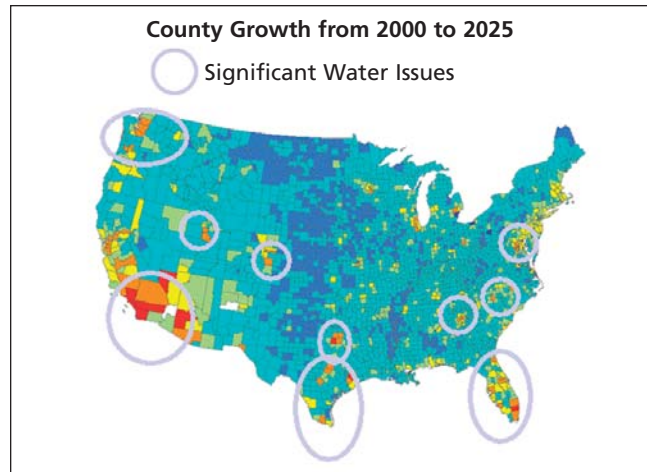


Figure 2. Projected demographic shifts and corresponding areas of water shortage.

- **More people in large cities on the coasts**

U.S. population will become more urbanized and concentrated in large megalopolises, many located in coastal areas that are at risk from severe weather events and arid regions that face limited availability of fresh water. Figure 2 shows projected growth rates in U.S. counties from 2000 to 2025 with high growth areas expected to experience shortages in water availability.

- **More older people**

The baby boom is growing older. The graying of America will also impact the USACE workforce since a growing portion of the work force is becoming eligible for retirement over the next five years. This poses a challenge for the organization in terms of succession planning and strengthening institutional knowledge and technical competencies.

INTERNATIONAL

- **More people**

The global population is expected to increase by 2.2 billion people by the year 2025 with the greatest gains in developing countries located in Asia, Africa, and Latin America. This population growth will lead to greater demands for scarce water supplies and increased environmental degradation in areas already struggling with regional political instabilities. As part

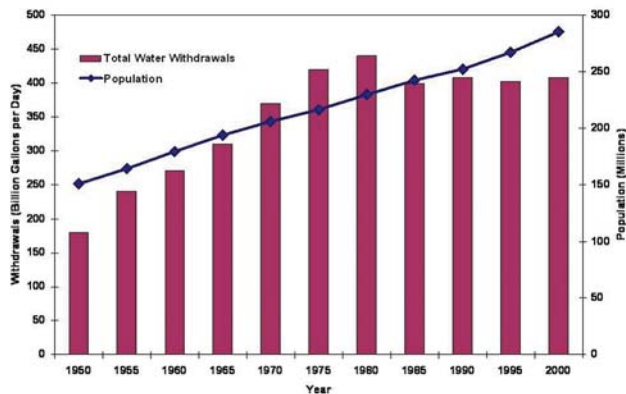


Figure 3. Trends in Population and Water Use.
Source: U.S. Geological Survey Circular 1268, "Estimated Use of Water in the United States in 2000."

of the U.S. National Security Strategy and overseas contingency operations for peace and security, the U.S. interest in assisting with regional stability operations, to include USACE Civil Works assistance, is expected to increase. This support is consistent with support to the Millennium Development Goals, which includes halving the number of people without access to clean water and sanitation. Currently over 900 million people do not have access to clean water and more than 2.5 billion lack adequate sanitation.

Increasing Demand for Water

As population increases, so does the demand for water (Figure 3). Energy production is a large user of water, and its demand for water could either increase or decrease, depending on future trends in water use efficiency and the development of new technologies (i.e., increase in air-cooled solar vs. water-cooled solar energy). Climate change can impact water demand in ways that are not yet well understood. For example, water demand for irrigation may increase in response to higher temperatures in the future, although changes in crop use and more efficient water use by plants as a result of higher carbon dioxide concentrations may reduce this impact. Decreased precipitation or changes in the form of precipitation (snow vs. rain) could result in mismatches between supply and demand on a seasonal basis. Water demand might change even in areas where increased precipitation is expected, depending on agricultural and municipal adaptation strategies. All changes in demand may require water managers to reevaluate the effectiveness of current demand management strategies. Conflicting demands for water supplies in the U.S. will stress the adaptive capacity of both individuals and institutions.

Energy

USACE generates 68 billion kilowatt-hours of hydroelectric power on average each year, and more than \$4 billion in annual gross power sales to recover the cost of construction, operation, and maintenance of these facilities. USACE also supports energy production and distribution indirectly through inland navigation, ports and harbor development and maintenance, water supply, and water resource related regulatory activities. The type and scope of this support will change as the Nation's energy production transitions from oil and gas with the development of improved energy storage, biofuels, wind, solar, and clean coal. Of particular interest to USACE are the volumes of water required for new energy production processes, and the changes in movements of coal, petroleum, and natural gas along the inland waterway system.

Climate Change

The details of exactly how climate change will unfold are uncertain. However, earlier spring snowmelts and spring pulses in streamflow have already been observed in the Western U. S., as shown in Figure 4. Over the coming decades, the effects of such warming have the potential to affect virtually all aspects of water resource management, including navigation, hydropower, flood risk reduction, ecosystems, coastal areas, water availability,

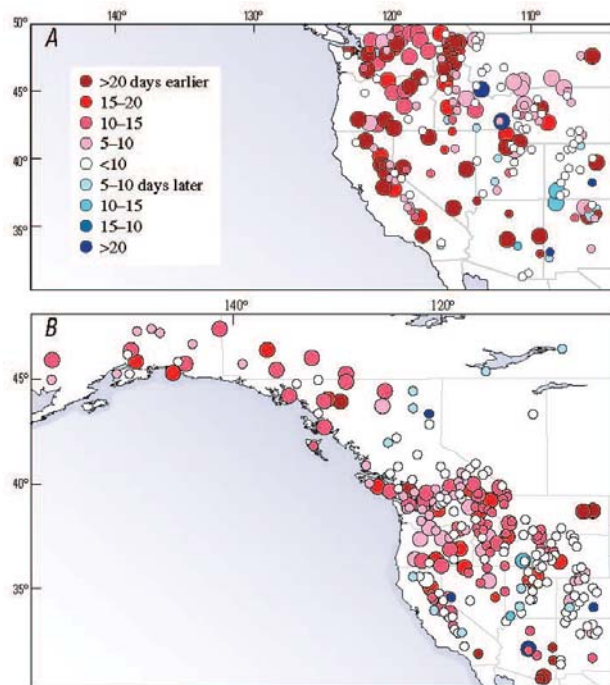


Figure 4. Figure A (top) Shows trends in yearly dates of spring snowmelt onset and Figure B peak of volume in yearly streamflow in western North America. Large circles indicate sites with trends differing significantly from zero. Source: Dettinger, 2005, "Changes in streamflow timing in the western United States in recent decades", U.S. Geological Survey Fact Sheet 2005-3018.

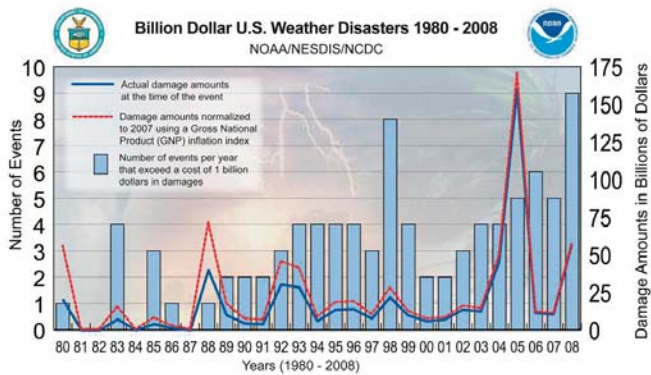


Figure 5. Trend in Billion Dollar Disasters 1980 – 2008.

Source: NOAA's National Climatic Data Center
<http://www.ncdc.noaa.gov/ol/reports/billionz.html>.

and water quality. Climate change can exacerbate water scarcities that will create and intensify conflicts over water distribution and use. Such challenges over water could lead to a loss of agricultural and industrial production and difficulties with inland navigation. Climate change is also expected to amplify issues related to sea level rise such as the impacts of coastal flooding and related storm damage, along with emergency preparation and flood risk management activities.

In response to climate change challenges, and recognizing the need for an integrated approach to water resources management, the USACE and its major water resources management partners Bureau of Reclamation (Reclamation), U.S. Geological Survey (USGS), and National Oceanic and Atmospheric Administration (NOAA) prepared a report “Climate Change and Water Resources Management: A Federal Perspective” (USGS 2009). The report summarizes climate change impacts to water resources management and reviews strategies to improve water management by tracking, anticipating, and responding to climate change.

Disasters

Considerable effort is expended throughout the Federal government to forecast the frequency and intensity of natural disasters. However, the Nation’s ability to forecast these events remains limited, and billion dollar weather disasters are increasing as shown in Figure 5. Preparations for floods and related storm damages should continue to best reduce risk to the citizens and property affected by disasters such as hurricanes and inland flooding. Of increasing concern are the growing numbers of individuals at risk because of population growth and a spatially shifting demographic, towards coastlines and rivers, rather than away from these hazardous locations.

Declining Biodiversity

Estimated recent extinction rates for freshwater species in the U.S. are at least 1000 times greater than extinction rates before European colonization, and more freshwater species have been lost to extinction, by a factor of three, than terrestrial species. Multiple stresses have contributed to this loss of species, including agricultural and urban development, the introduction of non-native species, and alteration and fragmentation of aquatic and wetland habitats. There is little doubt that the most important recovery need for imperiled freshwater species is habitat restoration. In response to this National need, USACE can, in collaboration with other agencies and non-government organizations, apply its aquatic ecosystem restoration authorities and capabilities to reverse the decline of freshwater biodiversity in the U.S.

Environmental Values

Our understanding of the interconnectivity of the natural and built environment continues to grow even as pressure from increased development continues to impact the natural environment. As understanding of human development impacts on water resources increases, the level of investigation and complexity of developing viable water resources solutions often increases as well. Developing water resources in a sustainable manner will involve cultural shifts and lifestyle changes, as well as technological innovation. Hiring, retaining, and maintaining currency of well-trained and talented employees that can effectively adapt to these evolving conditions remains an important challenge for USACE.

Faster and Better Information and Communication Technologies

Improved Information Technology will increase the reach and effectiveness of USACE, its partners, individual stakeholders, and nongovernmental organizations. It will also facilitate USACE’s efforts to collaborate with others and provide greater transparency to the public.



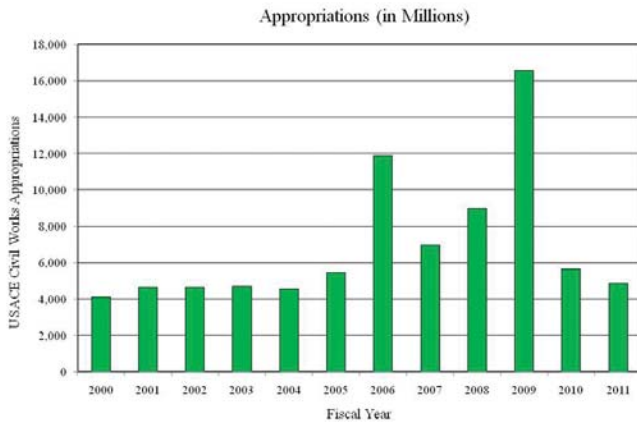


Figure 6. USACE Appropriations
Federal appropriations for the Civil Works program have been relatively stable over the past decade (in nominal dollars), with the exception of funding provided for Hurricane Katrina and the Recovery Act.

Globalization

International markets and economic agendas will affect U.S. trade and domestic production with corresponding impacts on waterborne commerce and water supply across a range of industrial and agricultural activities. The U.S. inland waterway system and ports that economically handle exports and imports are important contributing factors to economic growth.

Persistent Conflict

The potential for conflict will persist due to continuing political and economic changes in the greater Middle East and the spread of lethal capabilities. The likely impact of this situation is the continued role by the U.S. to serve as a regional moderator, though other powers such as Russia, China, and India, will play greater roles than today (National Intelligence Council 2008). The threat from terrorism is also expected to continue, and technology may enhance this danger. Providing regional stability will remain a U.S. national security issue and the assistance provided by USACE in water resources and development will remain an important component of the U.S. national strategy.

Governance

Great strides have been made to improve interagency and intergovernmental coordination on water resources, but additional improvement is needed. The direction provided by Section 2031, P.L. 110-114 (Water Resources Development Act of 2007) will be reflected in revised Principles and Guidelines (P&G) for Water Resources Planning, and the promulgation of a new P&G based on the principles of integrated water resource management.

Resource Constraints

Finite federal, state, and local budget resources available for water planning and management and infrastructure development have a direct impact on the Nation's water resources infrastructure (Figure 6). This will require rigorous analysis to ensure projects and programs are appropriately prioritized and the greatest value obtained by investment of taxpayer funds.

Aging Infrastructure

The Nation's water resource infrastructure constitutes an immense accumulation of assets requiring continual maintenance and periodic rehabilitation (see text box). Much of this infrastructure requires extensive maintenance and/or rehabilitation. Also of importance is the risk associated with the failure of these structures as they age and the populations within the impacted areas increase. Unscheduled outages due to mechanical breakdowns have been increasing, as shown in Figure 7, due to a variety of factors.

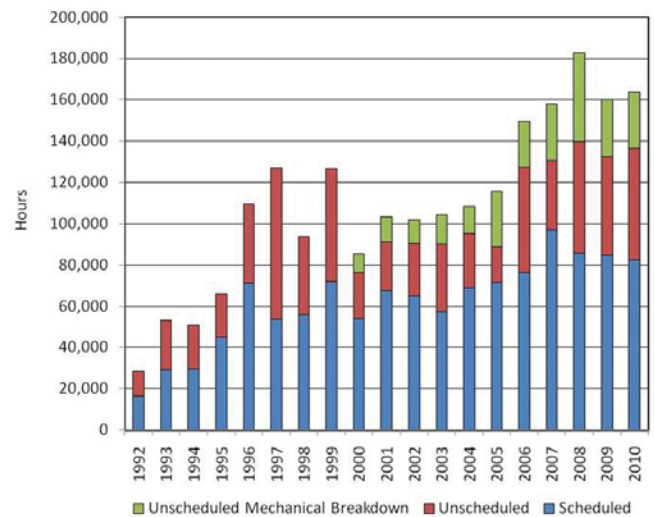


Figure 7. Increasing 'downtime' at USACE locks on the inland waterways navigation. Source: Navigation Data Center, Institute for Water Resources, USACE.

USACE's Aging Infrastructure

- 700 reservoirs that minimize risk of flooding and provide storage for water supply
- 12,000 miles of commercial inland waterways, 195 lock sites/241 chambers, and 926 shallow and deep draft harbors that move freight
- 11,750 miles of levee systems that reduce risk from flood waters
- 75 hydroelectric power facilities with 350 generating units that produce power for homes, businesses, and communities
- 54,874 miles of lake shoreline and recreation areas that support 370 million annual visitors, 350,000 jobs, and \$18 billion of economic activity

OVERARCHING AND CROSS-CUTTING STRATEGIES



In times of rapid change, such as the early 21st Century, successful government organizations will be those best able to handle uncertainty through adaptive attitudes, structures, and processes. Water resource agencies in particular face a growing need to make significant decisions, especially with respect to infrastructure, in the face of large uncertainties. For these reasons, a scenario-based strategic planning process was employed by the USACE Strategic Planning Team to develop a strategic plan that will be effective in a wide range of future conditions. The scenario-based strategic planning process produced several products including a complete report on the scenarios used to develop the cross-cutting strategies presented in this plan. Details of the scenarios are presented in U.S. Water Resources Scenarios Report, dated January 7, 2007, and released by the Civil Works Directorate in January 2007.

The objectives of USACE's scenario-based strategic planning exercise were to foster strategic thinking among senior leaders, create a culture that supports a strategic perspective, and produce a strategic plan that accounts for future uncertainties. The major outcome of this process was a set of six cross-cutting strategies that are robust across all scenarios, USACE business programs, and market segments. Collectively, these cross-cutting strategies comprise the elements of an Overarching Strategy, Integrated Water Resources Management, and provide the means to successfully accomplish the USACE Civil Works mission.

Overarching Strategy

Integrated Water Resources Management – *A holistic focus on water resource challenges and opportunities that reflects coordinated development and management of water, land, and related resources while maximizing economic services and environmental quality, and ensuring public safety while providing for the sustainability of vital ecosystems.*

Cross-Cutting Strategies

1. Systems Approach – *Water resources planning and management should be watershed in scale using systems analysis methods and tools to understand, assess and model the inter-*

connected nature of hydrologic systems (e.g., watersheds) and the economic and ecologic systems they support, and to identify and evaluate management alternatives from both time (life-cycle) and function (multi-purpose) perspectives.

The systems approach to water resources shifts the focus of making decisions from individual and sometimes isolated projects to an interdependent system, and from local or immediate solutions to regional and long term solutions that consider the entire life-cycle of projects. This new way of thinking and working recognizes water resources problems and opportunities exist in systems of interdependent parts e.g. inputs, processes, outputs,



ultimate outcomes, and feedback loops from each.

A systems approach reflects the reality that water exists in physical and social/cultural systems such that any single action triggers one or more responses and reactions in other parts of the system. USACE describes systems as natural or ecological systems and as sets of interlinked processes and programs. From these system descriptions, the resources and stakeholders that are integral to these systems can be identified, and solutions with an appreciation for the interconnections can be developed.

A systems approach implies the wisdom of considering a river basin, watershed, or coastal zone as a whole. For example, taking a systems approach means thinking of navigation as part of a transportation system, considering waterborne transport in the context of rail and road transport, and ecological resources touched by each mode. It means that navigation solutions must take into account the interests of key stakeholders such as shippers, consumers, port authorities, farmers who transport their commodities on rivers, commodity traders and users, environmental groups, dredgers, upstream and downstream interests, railroads and trucking companies.



Systems approaches and models can help planners and decision-makers deal with the complexities of a system, however it is defined. One such systems approach is Regional Sediment Management, a way to view the movement of sediment holistically. Such an approach views sediment as a resource rather than dredged material requiring disposal. This allows a focus on beneficial uses of dredged material such as wetland creation and beach nourishment.

2. Collaboration and Partnering – *Build and sustain collaboration and partnerships at all levels to leverage funding, talent, data, and research from multiple agencies and organizations.*

Partnerships allow each organization to contribute resources and thus assemble a greater pool of assets to solve problems. The willingness and skills to partner with other agencies and organizations is crucial to accomplishing USACE’s missions. Partnerships need to be built and sustained to leverage funding, talent, and data from multiple agencies and organizations, both nationally and internationally.

Partnerships across Federal agencies create efficiencies when scarce resources are combined toward common aims. An enhanced effort is needed to partner with increasingly sophisticated state and interstate organizations. Collaborating with tribes, local entities, and private not-for-profit entities will continue. Working with profit-making organizations is a possible next step that deserves additional investigation.

One partnership ripe for collaboration is with state water resources planners. States are facing critical water shortages from such external factors as population migration and climate change. Another issue they face is sedimentation in reservoirs, which is reducing storage capacity for water

supply. USACE’s strength in multiple water functions, project management, conflict resolution, and use of decision-support technologies such as Shared Vision Planning, positions USACE to facilitate comprehensive, coordinated, and integrated water resource planning. Not only can USACE experts and state water resource planners form a nexus of interests to solve current problems, they can also join forces to look ahead and to seek opportunities for greater cooperation in the larger watersheds where USACE managed reservoirs exist. An example of such a collaborative forum that involves all stakeholders is the Missouri River Recovery Implementation Committee (MRRIC). For more information see www.mrric.org

3. Risk-Informed Decision Making and Communication – *Develop and employ risk and reliability-based approaches that incorporate consequence analysis, especially risks to humans; identify, evaluate, and forestall possible failure mechanisms; and quantify and communicate residual risk.*

USACE must better integrate risk-informed decision making across its Civil Works program to include planning, design, construction, operations, and maintenance. This process includes risk assessment, risk management, and risk communication. There is an increasing recognition of the limits in disaster prediction and the protection provided by structural means against extreme events. A strategy to fully integrate risk analysis within USACE planning and operations as well as involvement by those impacted by a project is a significant challenge, but an important goal for the future.

4. Innovative Financing – *Think beyond traditional government appropriations and seek innovative arrangements such as public-private partnerships, revised funding prioritizations, and other appropriate funding mechanisms to develop and sustain the Nation’s water resources infrastructure.*

Innovative financing encompasses a number of arrangements such as de-authorizing projects; changing funding prioritizations; re-organizing or modifying existing funding mechanisms and accounts; and public-private partnerships.

Various forms of public-private partnerships can be effective when there are shared goals (i.e., ecosystem restoration) between USACE and non-governmental

“Integrated water resources management should be an instrument to explore adaptation measures to climate change...” Bates, et. al. 2008: Climate Change and Water. Technical Paper of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva.

organizations. Also, water resources infrastructure construction, operations, and maintenance could be accomplished through a mix of private and public funding. In summary, the application of a life-cycle approach (as discussed later under Goal 4) to operate and maintain projects over their design life can be an advantageous arrangement for both the government and private sector.

5. Adaptive Management – *Adaptive management is a decision process that promotes flexible decision making that can be adjusted in the face of risks and uncertainties—such as those presented by climate change—as outcomes from management actions and other events become better understood through monitoring and improved knowledge.*

Effective responses to water resources challenges incorporate adaptable and flexible approaches for management that anticipates future conditions. Adaptive management, a principle commonly used in ecosystem restoration, is a framework supporting flexible decision-making (National Research Council 2004). An important component of adaptive management is learning from monitoring data that measures responses to system interventions. Such insights can be used to develop future actions or change approaches. Adaptive management fosters continual learning, which benefits an organization by enabling it to adjust flexibly to changing conditions.

Adaptation has always been an important skill, and in a rapidly changing world is even more essential. Adaptive management provides feedback concerning how parts of a system work and affect other parts of the system. Climate change and the threat of greater extremes in precipitation and timing will require adaptation in the operation of existing infrastructure as well as revised standards in the planning and design of new water resources infrastructure. Disasters, both natural and manmade, will require the ability to expand and contract operations rapidly. Agility and responsiveness is a necessary quality for future success by any of the federal, state, or local water resource agencies.



6. State-of-the-Art Technology – *Embrace new and emerging technology for its fullest advantage. Invest in research that improves the resiliency of structures, assists in updating design criteria, and improves approaches toward planning and design.*

Investment in research and development must continue to provide both the technology that addresses contemporary problems and future innovations. Within USACE, the research and development laboratories, as organized under the Engineering Research and Development Center (ERDC), will facilitate this innovation. In partnership with the Institute for Water Resources (IWR) and the other Centers of Expertise, ERDC will employ technology transfer to infuse new technologies into practice.

USACE is committed to developing and maintaining a unified and interoperable geospatial program to support analysis, data presentation, outreach, and mapping across all business lines through the Enterprise GIS Program.

Technology also provides a competitive edge. For example, advances in communication, information accessibility, remote sensing, Building Information Modeling (BIM) and nanotechnology are particularly relevant. The Coastal and River Information System (CRIS) is one example of modern communication technology used to improve the efficiency and safety of the inland and intracoastal waterways. This system enables electronic capture of waterborne commerce data, management of waterborne traffic, and real-time communication with vessel operators concerning water traffic and hazards.

Additionally, advances in remote sensing, Building Information Modeling and geospatial information systems will facilitate monitoring of critical infrastructure such as dams and levees on both a routine basis and under periods of critical attention such as hurricanes. Investments in technology are investments in future adaptability and agility.

In summary, these Cross-Cutting Strategies are universal and apply to each Civil Works strategic goal. These strategies draw together common threads from the Scenario-Based Planning Process and Stakeholder Consultation. They permeate the entire Civil Works program and constitute the “how” in this plan: the essence of strategy. Combined, these strategies form a new business model that will ensure success in an uncertain future.

STRATEGIC GOALS AND OBJECTIVES



The Cross-Cutting Strategies discussed in the previous section are universal and apply to all Civil Works strategic goals discussed below.

The following Objectives and Performance Goals provide assessable measures to indicate progress by the USACE in meeting the Civil Works Strategic Goals. These measures include, but are not limited to the Army Civil Works High-Priority Performance Goals (HPPGs). In general, realistic performance targets for future years must be linked to expected levels of funding. Budget estimates are included in the following tables along with the performance goals and targets.

In many of the business lines, benefits are currently recognized and goals achieved only at the completion of a project. Therefore, to measure our progress in reaching these goals, USACE uses milestones to track project execution. Regular progress reviews may include the use of milestones such as Design Complete, Contract Award, Construction 50% Complete, etc.

The USACE is continuing to develop and refine its performance goals and measures. The goals and measures identified in this plan are preliminary and will be refined during development of the 2013 Budget. The funding levels shown for fiscal years 2013 and 2014 are illustrative and do not reflect policy decisions about future funding for these activities. Changes in budget amounts might affect performance targets in the out years.



CW Strategic Goal 1. ASSIST IN PROVIDING FOR SAFE AND RESILIENT COMMUNITIES AND INFRASTRUCTURE

In response to Hurricanes Katrina and Rita, Goal 1 specifies inclusion of safety and resiliency, while reducing both economic and human life losses from natural and man-made disasters. USACE will provide timely, effective, and efficient disaster preparedness, response, and recovery through its own flood fighting authority (PL 94-99) and through responses to missions assigned by the Federal Emergency Management Agency of the Department of Homeland Security.

■ Objective 1.1 Reduce the Nation's risk of flooding that damages property and places individuals at risk of injury or loss of life. (HPPG)

Reducing flood risk is a National imperative that requires coordinated federal, state, and local involvement. Population growth and demographic shifts continue to place more people and businesses at risk, while changes in land use and climate variations increase the magnitude and frequency of flood events. Engagement by USACE is one of the many needed efforts to address the Nation's flooding challenges.

Flood risk is a shared responsibility between private interests and local, state, and Federal government where to be

Table 1a. Fiscal performance measures and targets for Objective 1.1.

Fiscal Year	2011	2012	2013	2014
Budget (\$ Millions)	\$1,546	\$1,444	\$1,372	\$1,338
Performance Measures	2011 Target	2012 Target	2013 Target	2014 Target
1.1a Annual damages prevented exceed the target (\$ Millions) (cumulative).	163	190	199	236
1.1b Additional number of people protected from losses in the floodplain exceed the target. (Thousands) (cumulative).	1,240	1,370	1,625	1,837

*Final targets confirmed during budget development for the program year.

effective; all groups must work collaboratively toward common solutions. Historically, USACE’s contribution to flood risk reduction has been through the construction and maintenance of structural solutions such as levees, dams, and river channel modifications. Today, we understand that it is the synergistic impact of structural solutions in combination with non-structural solutions such as land use management by local authorities, FEMA’s flood insurance program, and similar initiatives that provide the most effective and comprehensive reductions in risk from floods. In support of this synergistic effort, USACE continues to construct and maintain a variety of flood control structures, but does so through extensive coordination with local and state governments and other Federal agencies to develop a combined structural and non-structural systems approach, which is a key component of the larger systems approach to water resources management called IWRM. One example of this coordination is the Silver Jackets outreach program where USACE works with state and local representatives to assist in the development of coordinated teams that work effectively with the full range of state and Federal agencies and programs.

■ **Objective 1.2 Improve the safety and security of water resources infrastructure.**

The safety and security of water resources infrastructure refers to the adequacy in design of dams, levees, pumping systems, etc to meet the demands of natural or manmade events (e.g., spring floods, hurricanes, earthquakes, terrorist attacks) and the maintenance of that infrastructure to perform as designed.

USACE is moving toward risk based design, where risk is determined by a combination of the probability that a particular event will occur and the consequences from that infrastructure failing. It is not practicable to design



all infrastructure to withstand every possible extreme event, so in addition to the protection provided by some infrastructure, a residual risk remains that needs to be identified and communicated to states and local communities. In addition, the “risk” by an event changes over time and requires periodic reevaluation since “downstream” consequences change with population growth and events such as climate change can change probabilities of occurrence. Using systems approaches that incorporate land use planning, building codes, insurance, evacuation procedures, and similar methods, useful and economically viable options can be applied to compensate for this residual risk.

Inspecting and maintaining water resources infrastructure is an equally essential challenge. In general, water resources infrastructure is large, expensive, and expected to remain fully functional for decades or centuries. It requires regular investments in evaluation, maintenance, and periodic rehabilitation.

USACE is engaged in several ongoing programs that directly support this objective including dam and levee safety evaluations and remediation of the highest-risk dams. Dams under remediation focus on evaluating and implementing actions to resolve safety concerns. Under this effort, USACE studies, identifies, and accomplishes needed corrective actions based on risk assessments.

USACE assesses the conditions of dams using the Dam Safety Action Class (DSAC), which are defined as follows. DSAC I dams require urgent and compelling action because of active failure or extremely high risk of failure. DSAC II facilities require urgent action because failure initiation is likely or a very high risk of failure exists. DSAC III includes dams with a high priority for action because the dam is significantly inadequate with

Table 1b. Fiscal performance measures and targets for Objective 1.2.

Fiscal Year	2011	2012	2013	2014
Budget (\$ Millions)	\$500	\$500	\$500	\$500
Performance Measures	2011 Target	2012 Target	2013 Target	2014 Target
1.2 Number of Dam Safety Action Classification (DSAC) Category I, II, III dams under remediation.	8*	10	11	13

*This number represents 100% of those dams identified as DSAC I as of 1 Oct 2010.

moderate to high risk of failure. Using this prioritization the USACE budgets funds to meet priority health, safety, and welfare needs of the public. As additional funds become available each year, remediation work can begin on additional dams.

CW Strategic Goal 2. HELP FACILITATE COMMERCIAL NAVIGATION IN AN ENVIRONMENTALLY AND ECONOMICALLY SUSTAINABLE FASHION.

Goal 2 includes the USACE navigation program, which provides safe, reliable, highly cost-effective, and environmentally sustainable waterborne transportation systems for the movement of commercial goods and national security needs. The program seeks to meet this responsibility through a combination of capital improvements and the operation and maintenance of existing infrastructure projects. The navigation program is vital to the Nation’s economic prosperity with 75 percent of America’s overseas international trade moving through its ports.

■ Objective 2.1 Help facilitate commercial navigation by providing safe, reliable, highly cost-effective, and environmentally sustainable waterborne transportation systems. (HPPG)

The Nation’s marine transportation system encompasses a network of navigable channels, waterways and infrastructure maintained by the USACE, as well as publicly-



and privately-owned marine terminals, intermodal connections, shipyards and repair facilities. The USACE maintains approximately 25,000 miles of inland and coastal waterways including 241 river locks at 196 sites and 926 coastal, Great Lakes, and inland harbors.

The USACE navigation program is also responsible for costs associated with the operation and maintenance of 241 locks with associated dams and 64 dams without locks that provide water storage for controlled releases to maintain dry season navigable depths, dredging of sediment to maintain navigable channel depths, and clearing waterways of snags and other impediments to commercial navigation.

CW Strategic Goal 3. RESTORE DEGRADED AQUATIC ECOSYSTEMS AND PREVENT FUTURE ENVIRONMENTAL LOSSES

Goal 3 focuses on the Army’s aquatic ecosystem restoration mission area, which seeks to restore aquatic habitat to a more natural condition in those ecosystems whose structures, functions, and dynamic processes have become degraded. This effort often includes the restoration of nationally- or regionally-significant saltwater and freshwater wetlands. These restorations are typically accomplished by modifying the hydrology (e.g., lakes, rivers, streams), supplying water to an area, and/or transporting water through a wetland. In addition, changes to geomorphology such as the direction and degree of ground slope or direction of stream channels may be required.

Table 2. Fiscal performance measures and targets for Objective 2.1.*

Fiscal Year	2011	2012	2013	2014
Budget (\$ Millions)	\$1,653	\$1,570	\$1,710	\$1,751
Performance Measures	2011 Target	2012 Target	2013 Target	2014 Target
2.1.a Limit the number of instances where mechanically driven failure or shoaling results in the closure of a high or moderate commercial use segment anywhere in the Nation for more than 24 hours to less than the target.	38	37	36	35
2.1.b Limit the number of preventable closures that last longer than one week to less than the target.	21	20	19	18

*Note: Budget numbers include entire USACE navigation program, while measures relate only to inland navigation.

■ Objective 3.1 Provide sustainable development, restoration, and protection of the Nation’s water resources by restoring degraded habitat. (HPPG)

The FY 2011 target for restoring degraded habitat on 10,300 acres reflects an increase of 17 percent over the total acreage estimated to have been restored during 2005-2010. This HPPG goal was developed based on mid-2010 data regarding expected completions in 2011. Acres are counted upon physical completion of aquatic ecosystem restoration projects. The acres completed in any fiscal year may vary greatly depending on the number and size of projects completing that year. There is no direct correlation between the number of acres completing and that year’s budget, as annual budgets also include funds for purposes such as planning and designs for new projects and construction of projects that will complete in future years. Additionally, the work items that complete many projects may have been funded in previous years.

The FY 2012 budget contains funding to continue progress towards the completion of significant ecosystem restoration projects but no completions are included. However, it is expected that some ongoing projects will complete in 2012 providing additional benefits.

The completed aquatic ecosystem restoration projects will contribute to restoration of more natural conditions and improve the sustainability of various ecosystems. Construction of the projects provides the conditions necessary for achievement of ecological success but full achievement of the benefits may not occur for several years.

■ Objective 3.2 Prevent future environmental losses by executing the regulatory mission in a manner that protects the aquatic environment (ensures zero net-loss of wetlands) while making timely, fair permit decisions. (HPPG)

The objective of the Clean Water Act (CWA) is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” Toward achievement of this goal, the CWA prohibits the discharge of dredged or fill material into wetlands, streams, and other waters of the United States unless a permit is issued by the USACE or approved state under CWA Section 404. When there is a proposed discharge, all appropriate and practicable steps must first be taken to avoid and minimize impacts to aquatic resources. For unavoidable

Table 3a. Fiscal performance measures and targets for Objective 3.1.

Fiscal Year	2011	2012	2013	2014
Budget (\$ Millions)	\$586	\$533	\$542	\$554
Performance Measures	2011 Target	2012 Target	2013 Target	2014 Target
3.1 Acres of habitat restored, created, improved, or protected equal or exceed the target.	11,300	10,900	17,432	12,820

impacts, compensatory mitigation is required to replace the loss of wetland, stream, and/or other aquatic resource functions. The USACE (or approved state authority) is responsible for determining the appropriate form and amount of compensatory mitigation required. Methods of providing compensatory mitigation include restoration, establishment, enhancement, and in certain circumstances, preservation of aquatic resources.

USACE will develop and implement actions that will result in streamlined and transparent regulatory processes that balance economic development while sustaining aquatic resources. Initiatives will focus on achieving greater consistency across Districts, improving responsiveness and efficiency, and aiding the decision making process.

Table 3b. Fiscal performance measures and targets for Objective 3.2.

Fiscal Year	2011	2012	2013	2014
Budget (\$ Millions)	\$189	\$196	\$208	\$214
Performance Measures	2011 Target	2012 Target	2013 Target	2014 Target
3.2.a Individual Permit Compliance (% of all individual permits on which USACE completed an initial compliance inspection).	10%	10%	10%	10%
3.2.b General Permit Compliance (% of all general permits on which USACE completed an initial compliance inspection).	5%	5%	5%	5%
3.2.c Mitigation Compliance (% of all mitigation on which USACE completed an initial compliance inspection).	5%	5%	5%	5%

■ Objective 3.3 Assist in a cost-effective manner in the clean-up of contaminated, hazardous, toxic, and radioactive waste sites as authorized or requested by others under the Formerly Utilized Sites Remedial Action Program (FUSRAP).

USACE is assigned the responsibility of implementing the Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP sites are contaminated by hazardous, toxic, or radioactive wastes as a result of work performed as part of the Nation’s early atomic energy program.

There is a decrease in the number of properties in the out-years because funding is anticipated to decrease. Also, there are fewer vicinity properties associated with the projects scheduled for remediation over the next three years.

CW Strategic Goal 4. IMPLEMENT EFFECTIVE, RELIABLE, AND ADAPTIVE LIFE-CYCLE PERFORMANCE MANAGEMENT OF INFRASTRUCTURE

Goal 4 places an increased emphasis on adaptive operations and management of existing USACE projects throughout their life cycle. Reliability is part of this goal and reflects the increased implementation of risk-based asset management especially in operation and maintenance of USACE navigation and flood risk management infrastructure. USACE gives priority to ensuring that existing projects function safely. The USACE will continue to strive for integration of environmental considerations in the operation, maintenance, and rehabilitation of existing projects.

■ Objective 4.1 Increase the amount of hydropower produced at USACE dams.

USACE’s multipurpose dam and water reservoir authorities provide hydroelectric power as an additional benefit of projects built for navigation and flood control. USACE is the largest owner-operator of hydroelectric power plants in the United States and one of the largest in the world. USACE operates 350 generating units at 75 multipurpose reservoirs, mostly in the Pacific Northwest. The facilities account for approximately 24 percent of the Nation’s hydroelectric power and approximately 3 percent of the country’s total electrical generation capacity. USACE hydroelectric plants produce nearly 70 billion kilowatt-hours each year—sufficient to serve about 7 million households or equal to 12 cities the size of Seattle, WA. Hydropower is a renewable energy source and one of the least environmentally disruptive sources of electric power generation,

Table 3c. Fiscal performance measures and targets for Objective 3.3

Fiscal Year	2011	2012	2013	2014
Budget (\$ Millions)	\$130	\$109	\$109	\$109
Performance Measures	2011 Target	2012 Target	2013 Target	2014 Target
3.3.a Cubic yards of contaminated material disposed in a safe and legal disposal facility exceeds the target.	119,000	100,000	100,000	100,000
3.3.b Number of properties returned to beneficial use exceeds the target.	16	3	2	2

producing none of the airborne emissions that contribute to acid rain or greenhouse gases.

The USACE’s hydroelectric generation is marketed by Department of Energy Power Marketing Administrations to preference customers in several regions of the United States. To evaluate its effectiveness in delivering products for customers to purchase, the USACE compares key performance measures with industry standards, in addition to the actual electrical energy generated. Peak availability is an indicator of the availability of the generating equipment during critical times of the year and forced outage is an indicator of how long a piece of equipment is removed from service due to some unforeseen problem, such as equipment failure.

CW Strategic Goal 5. BUILD AND SUSTAIN A HIGH QUALITY, HIGHLY DEDICATED WORKFORCE

This goal encompasses all aspects of a competent team including technical excellence, tools to attract and

Table 4. Fiscal performance measures and targets for Objective 4.1

Fiscal Year	2011	2012	2013	2014
Budget (\$ Millions)	\$207	\$174	\$165	\$160
Performance Measures	2011 Target	2012 Target	2013 Target	2014 Target
4.1.a Peak unit availability will equal or exceed the target (percentage of time generating units are available during periods of peak demand).	87.0%	87.8%	88.6%	90.0%
4.1.b Percentage of time units are out of service due to unplanned outage does not exceed the target.	4.25%	4.00%	3.75%	3.50%

maintain a high-quality work force, improved communications, and sound financial performance. The essence of this human resources goal is that a broad range of skill sets will be needed by the USACE workforce of the future. These skills must build on USACE's current core competencies and technical strengths as well as attract highly motivated employees.

Engineers will continue to be a major part of the organization, with disciplines such as systems engineering, geotechnical engineering, hydrology and hydraulics, risk management, finance, project and program management increasing in importance. However, the requirements of USACE future missions will require people with strong communication, problem solving, and collaboration abilities as well as technical skills. USACE employees of the future will also face increasingly complex social and political challenges. Consequently, the USACE will place greater emphasis on interpersonal skills, problem solving, and creative thinking.

■ Objective 5.1 Establish tools and systems to get the right people in the right jobs. Then develop and retain this highly skilled workforce.

Getting the right people in the right jobs is essential for mission success. In addition, training and continuing education are increasingly important activities as the USACE works to keep its workforce current in evolving engineering and design concepts and practices. Success in this area means having leaders and employees whose technical leadership, management, and communication

Table 5. Fiscal performance measures and targets for Objective 5.1.

Performance Measures	2011 Target	2012 Target	2013 Target	2014 Target
5.1.a Establish innovative USACE recruitment approaches for recruiting a diverse and talented workforce.	Qualitative annual assessment			
5.1.b Increase the number of job applicants, by the target percentage, above the number of previous year applicants.	10%	10%	10%	10%
5.1.c The target number of hiring managers are annually satisfied with the quality of applicants.	95%	95%	95%	95%
5.1.d Shape the workforce through innovative retention strategies to meet the Nation's engineering challenges.	Qualitative annual assessment			
5.1.e. Percentage of new employees undergo the on-boarding process immediately upon being hired exceed the target.			90%	90%

abilities equal or exceed the requirements of their current position and prepare them for advancement.

A summary of Strategic Goals, Objectives, and Performance Goals are included in Table 6.

Table 6. Summary of Strategic Goals, Objectives, and Performance Metrics

STRATEGIC GOAL 1 Assist in providing for safe and resilient communities and infrastructure	
Objective	Performance Measures
<i>1.1 Reduce the Nation’s risk of flooding that damages property and places individuals at risk of injury or loss of life. (HPPG)</i>	1.1.a Annual damages prevented exceed the target. 1.1.b Additional number of people protected from losses in the floodplain exceed the target.
<i>1.2 Improve the safety and security of water resources infrastructure.</i>	1.2 Number of Dam Safety Action Classification (DSAC) Category I, II, III dams under remediation.

STRATEGIC GOAL 2 Help facilitate commercial navigation in an environmentally and economically sustainable fashion.	
Objective	Performance Measures
<i>2.1 Help facilitate commercial navigation by providing safe, reliable, highly cost-effective, and environmentally sustainable waterborne transportation systems. (HPPG)</i>	2.1.a Limit the number of instances where mechanically driven failure or shoaling results in the closure of a high or moderate commercial use segment anywhere in the Nation for more than 24 hours to less than the target. 2.1.b Limit the number of preventable closures that last longer than one week to less than the target.

STRATEGIC GOAL 3 Restore degraded aquatic ecosystems and prevent future environmental losses	
Objective	Performance Measures
<i>3.1 Provide sustainable development, restoration, and protection of the Nation’s water resources by restoring degraded habitat. (HPPG)</i>	3.1 Acres of habitat restored, created, improved, or protected equal or exceed the target.
<i>3.2 Prevent future environmental losses by executing the regulatory mission in a manner that protects the aquatic environment (ensures zero net-loss of wetlands) while making timely, fair permit decisions. (HPPG)</i>	3.2.a Individual Permit Compliance (% of all individual permits on which USACE completed an initial compliance inspection). 3.2.b General Permit Compliance (% of all general permits on which USACE completed an initial compliance inspection). 3.2.c Mitigation Compliance (% of all mitigation on which USACE completed an initial compliance inspection).
<i>3.3 Assist in a cost-effective manner in the clean-up of contaminated hazardous, toxic, and radioactive waste sites as authorized or requested by others under the Formerly Utilized Sites Remedial Action Program (FUSRAP).</i>	3.3.a Cubic yards of contaminated material disposed in a safe and legal disposal facility exceeds the target. 3.3.b Number of properties returned to beneficial use exceeds the target.

Table 6. Summary of Strategic Goals, Objectives, and Performance Metrics

STRATEGIC GOAL 4 Implement effective, reliable, and adaptive life-cycle performance management of infrastructure	
Objective	Performance Measures
<p><i>4.1 Increase the amount of hydropower produced at USACE dams.</i></p>	<p>4.1.a Peak unit availability will equal or exceed the target (percentage of time generating units are available during periods of peak demand).</p> <p>4.1.b Percentage of time units are out of service due to unplanned outage does not exceed the target.</p>

STRATEGIC GOAL 5 Build and sustain a high quality, highly dedicated workforce	
Objective	Performance Measures
<p><i>5.1 Establish tools and systems to get the right people in the right jobs. Then develop and retain this highly skilled workforce.</i></p>	<p>5.1.a Establish innovative USACE recruitment approaches for recruiting a diverse and talented workforce.</p> <p>5.1.b Increase the number of job applicants, by the target percentage, above the number of previous year applicants.</p> <p>5.1.c The target number of hiring managers are annually satisfied with the quality of applicants.</p> <p>5.1.d Shape the workforce through innovative retention strategies to meet the Nation’s engineering challenges.</p> <p>5.1.e Percentage of new employees undergo the on-boarding process immediately upon being hired exceed the target.</p>



To realize the USACE Vision, “*Contribute to the strength of the Nation through innovative and environmentally sustainable solutions to the Nation’s water resources challenges,*” and to further support and implement this Strategic Plan, there must be a focus on identifying outcomes and measuring performance. At the strategic level, criteria for success should relate to the five strategic goals, and reflect progress toward them. Plans, programs, and projects should:

- Deliver measurable improvements in public safety and protection of property
- Generate broad-based economic and environmental benefits to the Nation
- Solve water resource problems in a sustainable manner, thus ensuring that the resource will be available for future generations

There are several processes and systems in place to evaluate the performance of the Civil Works Program. This evaluation takes place in a corporate context to facilitate evaluation of all major USACE programs and the USACE Campaign Plan.

The Chief of the Civil Works Programs Integration Division in Headquarters has been designated as the USACE Performance Improvement Officer (PIO) in accordance with the “GPRM Modernization Act of 2010.” This position is the focal point for performance improvement within USACE. Both the PIO and his Deputy participate on the cross-agency Performance Improvement Council (PIC) and work with the Office of Management and Budget (OMB) and the PIC on ways to improve government performance.

Five Year Development Plan (FYDP) - USACE has created linkages between its strategic goals and business program goals within the Five Year Development Plan.

Performance measures are generally specific to business programs. Senior leaders are accountable for accomplishment of strategic goals so there is a connection between USACE goals, objectives, and performance measures as described above.

High Priority Performance Goals (HPPGs) – The HPPGs represent a subset of agency goals that do not require additional resources or legislative action to achieve within an 18 to 24-month time frame, but rather hinge on strong execution.

Customer Satisfaction Surveys – Customer satisfaction surveys are used to improve service and delivery of USACE products and services.

The performance of USACE’s Civil Works Business Programs is continually evaluated with the help of the performance measures, the results of which are published in the Management’s Discussion and Analysis section of the Army’s annual financial statement. New performance measures are introduced in the Five-Year Development Plan to present a detailed overview of funding and performance in coordination with the Civil Works Program Strategic Plan. This evaluation assists USACE in achieving its desired strategic direction.

One of the primary missions of Headquarters USACE is the development of key relationships with other Federal agencies. USACE Business Program managers regularly use these relationships to benchmark their progress with similar programs and explore opportunities for common measures as well as improving program performance. USACE personnel participate on various Construction Industry Institute teams to share and explore best management practices with the private sector and other agencies. Additionally, USACE dialogues continuously with its partners and stakeholders to review and benchmark progress on program performance.

CONCLUSION



The purpose and ultimate outcome of USACE's Civil Works strategic direction is to implement this plan's Overarching Strategy—Integrated Water Resources Management (IWRM). This holistic approach will provide the greatest benefit from available resources regardless of the business line. However, to achieve this aim the USACE and Nation will be required to place greater emphasis on environmental sustainability and watershed issues, while shifting planning and management activities toward a system-based geographic unit. Success will depend on multi-level collaboration and application of scientific and engineering principles that reflect the interconnected nature of the natural and constructed environments. The result will be increasingly complex projects, conducted with more sophisticated partners, in both a national and international context.

Implementing IWRM requires fundamental changes in the USACE and national culture, policies, and procedures. A nurturing of interactive processes among a variety of stakeholders and partners is needed to interweave roles, develop cohesion, and identify common needs and approaches while addressing multiple issues. This Strategic Plan recognizes the emerging capabilities of the USACE Civil Works Program, as facilitator and also developer and provider of data, tools and programs for local, state, and federal agencies as they implement IWRM. The cross-cut-

ting strategies become the means for USACE to implement this vision. The outcome of this approach will be sustainable water resources solutions that meet the needs of the Nation through wise use of taxpayer dollars.

USACE has an invaluable and diverse portfolio of capabilities that can be leveraged in new combinations within the Civil Works program. The beginning of the 21st Century presents an unparalleled opportunity to shape water resources policy within the United States. The application of the vision and strategies of this Strategic Plan provide a viable and reasonable course of action that paves a path toward a sustainable water future for America.



"The way in which we manage our water resources can improve the quality of our citizens' lives. It has affected where and how people live and influenced the development of this country. The country today seeks economic development as well as the protection of environmental values." LTG Robert L. Van Antwerp, Chief of Engineers

References

Brekke, L.D., Kiang, J.E., Olsen, J.R., Pulwarty, R.S., Raff, D.A., Turnipseed, D.P., Webb, R.S., and White, K.D. (2009) "Climate Change and Water Resources Management --A Federal Perspective" U.S. Geological Survey Circular 1331, 65 p. (Also available online at <http://pubs.usgs.gov/circ/1331/>.)

Civil Works Directorate, Strategic Planning Team (2005-2009) "U.S Army Corps of Engineers Civil Works Program Scenario-Based Strategic Planning" U.S. Army Corps of Engineers, Washington, DC.

National Intelligence Council (2008) "Global Trends 2025: A Transformed World" U.S. Government Printing Office. Washington, DC. ISBN 978-0-16-081834-9. (Also available online at www.dni.gov/nic/NIC_2025_project.html.)

National Research Council (2004) "Adaptive Management for Water Resources Project Planning" National Academies Press. Washington, D.C., 138 p.

