



*Excerpts from*

# REPORT OF THE SECRETARY OF THE ARMY ON CIVIL WORKS ACTIVITIES FOR FY 05





# INSTITUTE FOR WATER RESOURCES

## BACKGROUND

The U.S. Army Institute for Water Resources (IWR) is a field operating activity under the staff supervision of the Director for Civil Works, Headquarters, U.S. Army Corps of Engineers (HQUSACE). The Institute is the USACE center of expertise for integrated water resources management (IWRM), focusing on planning analysis and hydrologic engineering, and on the collection, management and dissemination of civil works and navigation information, including the Nation's waterborne commerce data.

The Subcommittees on Public Works, House and Senate Appropriations Committees, authorized the establishment of IWR in 1969 to facilitate the adaptation of the Civil Works Program to future needs by providing the USACE with the capability for developing forward-looking analysis and state-of-the-art methodologies. The Institute's mission is to support the Civil Works Directorate and the USACE MSC's and District offices by providing: (a) analysis of emerging water resources trends and issues; (b) state-of-the-art planning & hydrologic engineering methods, models and training; and, (c) national data management and results-oriented program and project information.

## IWR CENTERS

IWR has offices at three locations, each of which is a designated USACE center of expertise (DX): the National Capital Region (NCR) office in the Casey Building at the Humphreys Engineer Center, Alexandria, Virginia; the Hydrologic Engineering Center (HEC) in Davis, California; and the Waterborne Commerce Statistics Center (WCSC), which is part of the NCR's Navigation Data Center (NDC), in New Orleans, Louisiana.

**National Capital Region Office:** The IWR NCR office is the Corps DX for the development of planning methods and analytical tools through a synergy of water resources planning and socio-economic expertise that blends practice with research, policy development and information. IWR planners, economists, social scientists, civil engineers and specialists in the physical sciences lead civil works strategic, planning and technology

transfer initiatives; conduct national and focused policy development studies; develop a broad range of partnering and investment decision-support techniques, methods and models for IWRM and navigation system applications; provide national and international interface with the water resources community at-large; and, partner with the HQUSACE, Corps field offices and laboratories in solving complex technical water resources planning and evaluation problems. In particular, the Institute provides a critical mass of socio-economic expertise within the Corps, and serves as the residence for the Corps Chief Economist and provides leadership of the Economics Community of Practice (CoP).

**Hydrologic Engineering Center (HEC):** Since its formation in 1965, HEC has pioneered the practice of watershed hydrology and river-based engineering. HEC's primary goal is to support the nation in its water resources responsibilities by providing technical leadership for increasing the Corps capability in hydrologic engineering and water resources planning and management. By means of its programs in research, technology transfer/training, planning analysis, and technical assistance, HEC keeps abreast of the water resources challenges facing the nation and the Corps, along with the latest developments throughout the profession, and makes use of this information to the technical engineering needs of the Corps. In particular, HEC aims to increase the effectiveness of the Corps and the profession by bridging the gap between the academic community, practicing hydrologic engineers, and planning professionals, with the result that HEC's suite of hydrologic, hydraulic and planning models have set industry standards worldwide. HEC is the Corps DX for hydrologic engineering methods and models across a broad range of areas: Precipitation-runoff processes, reservoir systems analysis, hydrologic probability and risk analysis, river hydraulics and sediment transport, groundwater hydrology, water quality, and analytical aspects of water resources planning. Applications areas include: Flood damage reduction, water control management, hydroelectric power, navigation, erosion control, water supply, watershed studies, and ecosystems restoration.

**Navigation Data Center:** NDC is the Corps DX for the management of information on infrastructure, utilization and performance of U.S. waterways and port and harbor channels. Because of the integrated nature of water resources, NDC also directly supports a range of related CW business areas, including: hydropower, recreation, environmental compliance, natural resources, regulatory, emergency and readiness; along with other Federal, state, local agencies; plus the private sector. The primary operational arm of NDC is Waterborne Commerce Statistics Center (WCSC), which provides one-stop capability for national navigation information systems. NDC also provides integrated business information in support of Corps decision making to include financial, output, and performance measurements.

### **FY 2005 SUMMARY**

FY 05 was a remarkably productive year for the Institute for Water Resources (IWR), during what was one of the most challenging periods in its 36-year history. During FY05 IWR executed a Civil Works Program of \$29 million with 154 in-house employees, primarily in professional disciplines with most possessing advanced degrees. IWR's in-house staff was supplemented by other experts detailed from USACE field offices and laboratories; Intergovernmental Personal Act (IPA) visiting scholars from universities and policy think tanks; and the private sector.

FY05 proved especially rewarding as it represented the first full year of operations under the Institute's "new" internal organizational structure in alignment with USACE 2012, with the IWR management paradigm based on a matrix team approach in-lieu-of-a traditional function-based, stove-piped organization. IWR's new structure was previously approved in July 2004 upon approval of its updated Organization and Functions Statement, Engineering Regulation (ER) 10-1-23.

IWR's key accomplishments in FY05 include its technical role in supporting the USACE-wide implementation of the Civil Works Strategic Plan (IWR had previously led the completion of the plan in FY04); the continued publishing of groundbreaking new research on maritime transportation economics flowing from the Navigation Economic Technologies (NETS) Research Program; the completion of the Lake Ontario and St. Lawrence River Study for the International Joint Commission (IJC); fielding new versions of HEC's flagship NexGen software products; improving and fielding new versions of the Corps Water Management

System (CWMS) and the Civil Works Program's Operations and Maintenance Business Information Link (OMBIL), including significant progress on the deployment of OMBIL's Regulatory program module (ORM); initiating (pre-Katrina) a national flood risk initiative aimed at addressing residual flood risk at areas protected by levees; continuing progress building federal interagency partnerships with the Department of Interior (Bureau of Reclamation and U.S. Geological Survey), Department of Energy (Oak Ridge National Laboratories and Sandia National Laboratories), Department of Agriculture (Economic Research Service and the Natural Resources Conservation Service), and the Federal Emergency Management Agency; and executing a number of wide number of critically important technical assistance projects, including a growing number of significant technical activities in the international arena such as with the U.S. Agency for International Development (USAID) in support of the Iraqi Ministry of Water Resources.

As FY05 came to a close, the Institute was in the process of initiating an unprecedented array of technical initiatives at both IWR NCR and HEC in support of the USACE response to/and the post-event analysis of Hurricanes Katrina and Wilma, while at the same time, proceeding through the throes of IWR's own disaster recovery and mission reconstitution process for the Waterborne Commerce Statistics Center (WCSC) which is co-located at the New Orleans District (CEMVN) and was likewise victimized by Hurricane Katrina. All of WCSC's 39 people (and 15 resident contractor staff) safely evacuated from greater New Orleans the weekend prior to Hurricane Katrina's impact; however, approximately half of the WCSC staff ultimately suffered devastating personal losses to their homes and property.

The accomplishments of IWR during FY05 are described in accord with its major focus areas.

### **STRATEGIC THINKING**

**Future Directions:** The major activities included supporting implementation of the Fiscal Year 2004-09 Civil Works Strategic Plan published in FY 2004, participating in development of the next strategic plan through research and scenario development, and developing policy responses to new challenges, including the need for unified flood risk management. The release of the CW Strategic Plan in 2004 represented the culmination of a multi-year effort aimed at establishing a new direction for the Civil Works Program based on the contemporary

“watershed” planning approach of Integrated Water Resources Management (IWRM). The plans five strategic goals are firmly grounded in the “systems” perspective of IWRM and are fully aligned with the principle of environmental sustainability.

**Emerging Issues:** Although the Institute anticipated questions about the adequacy of the nation’s flood and storm damage protection infrastructure, the urgency of responding to Hurricane Katrina reoriented the IWR’s FY05 program. Just prior to Hurricane Katrina the Institute prepared five issue papers regarding the nation’s preparedness for floods and hurricanes and held a Provocation Session on this subject for Corps Senior leaders. Subsequently, IWR scoped a unified flood risk management policy paper based on lessons from Katrina and ongoing case studies of California flood management.

After Katrina struck, the Chief of Engineers demanded answers to questions about the performance of the New Orleans Hurricane Protection System. To answer these questions, the USACE established the Interagency Performance Evaluation Team (IPET). IWR was designated co-lead of the consequences assessment and interior flood control (IFC) sub-teams. The former team was charged with measuring the economic, human health, social, and environmental consequences of Katrina, while the IFC team undertook an in-depth evaluation of New Orleans interior flood systems. In addition to IPET, the HQUSACE anticipated that there would be questions about the decisions that lead to the design and construction of New Orleans Hurricane Protection System. In response to this challenge, IWR organized a Hurricane Protection Decision Chronology (HPDC). Planning Forensics team that will report findings after IPET activities are completed in 2006.

**Post Katrina Studies:** The planning for what became the Interagency Performance Evaluation Task Force (IPET) was initiated at the end of FY05 following the devastating effects of hurricane Katrina. IWR staff participated in developing the plan of study for IPET helping to organize the overall study within a risk analysis framework. Additionally, IWR provided logistics and support for the IPET study development team. IPET work was started at the beginning of FY06. The IPET study is comprised ten interrelated tasks involving over 150 experts from USACE, other Federal agencies, local agencies, academics and contractors. IWR provided the co-leads and technical experts for the tasks on interior drainage and consequence assessment.

IPET is scheduled to conclude with a final draft report by 1 June FY06.

In FY05, IWR developed the plan of study, formed the study team and initiated what became the Hurricane Protection Decision Chronology (HPDC) study and team. HPDC was established at the direction of HQUSACE. It is acting as a complement to IPET by assembling and documenting the chronological record of planning, economic, policy, legislative, institutional, and financial decisions that influenced the design, scale, configuration, and condition of the greater New Orleans hurricane protection system. The team is composed of external experts on water resources planning, non-Federal flood and storm water protection, and IWR staff under the overall direction of IWR. The schedule for a draft report is 30 days after the completion of the IPET.

**Flood Risk Management Initiative:** Collaboration with FEMA, other Federal agencies, state and local governments, and important associations like NAFSMA and ASFPM is critical to the development of a sound national flood risk management strategy. Minimizing institutional barriers to efficient and effective water resources planning, decision making, and management, is defined by the Civil Works Strategic Plan as one of the five challenges affecting the nation water resources. To effectively address this challenge, institutional barriers must be broken down both between and within individual agencies. Flood risk management in the U.S. today presents a stark example of a water resource issue where minimization of institutional barriers through collaboration is essential to ensuring the safety of our citizens. The Institute of Water Resources has been instrumental in developing collaborative partnerships to improve the management of flood risks across the nation.

The basic framework for collaborative partnerships in flood risk management has been created through the Levee Policy Committee of the FEMA Map Modernization Program, the quarterly FEMA-Corps-NAFSMA-ASFPM Senior Leaders meetings on flood risk management, previously long-standing relationships between the Corps and NAFSMA through the Corps Flood Damage Reduction Program and, to a lesser extent, Memorandums of Understanding with FEMA, the Bureau of Reclamation, USGS and NRCS.

Over the last two years the Institute has provided intellectual leadership of both the Levee Policy Committee and the FEMA-Corps-NAFSMA-ASFPM senior leader meetings. The Levee Policy committee includes representatives from all Federal water resource

agencies as well as state agencies and organizations such as NAFSMA, ASFPM and insurance companies with an establish goal of articulating levee policy for the FEMA Map Modernization Program. Similar to the Levee Policy Committee, the FEMA-Corps-NAFSMA-ASFPM senior leader meetings were initiated in August 2005 to discuss flood risk coordination issues, again, primarily related to the Map Modernization program.

In order to improve partnering at the state and regional level, the Institute worked in cooperation with the Federal Emergency Management Agency to establish an initiative called "Silver Jackets". The concept focuses on USACE and FEMA partnering with State agencies as lead facilitators in establishing an interagency team with each state. The purpose of these teams is to work collaboratively with the State and appropriate stakeholders in developing and implementing solutions to natural hazards by combining available agency resources, which include funding, programs, and technical expertise. Each team's membership and goals will be geared toward that particular state.

An interagency team, the Silver Jackets, was implemented in a pilot state – the State of Ohio. Core team members include USACE, FEMA, USGS, NRCS, HUD, EDA, NWS, Ohio Division of Natural Resources (ODNR), Ohio Emergency Management Agency (OEMA), and Ohio EPA. The State of Ohio, hesitant at first, now fully supports the team - demonstrated most recently by the State submitting this team as a program that should be supported by local congressional interests. An additional team has recently been established in the State of California. Nineteen different Federal and state agencies attended the initial meeting conducted in July 2005, demonstrating the interest and support of this concept.

**USACE Chief Economist:** Dr. David Moser of IWR is the USACE Chief Economist and leader of the Economics Sub-Community of Practice (Cop). FY05 activities included the organization of senior economists group which includes senior economists from each MSC's, HQUSACE and IWR. This group held two meeting during FY05 with the primary goal of improving economic analysis capability within USACE. To that end, the senior economists group developed a subject matter expert database of all economists in USACE which includes assessment of the experience and expertise of each economist for each economic activities conducted by USACE. Additionally a listing of core competencies by project purpose was developed providing the major activities and skills necessary to complete those activities. The

group is working on developing a "gap" analysis to identify needed skills and capabilities. Work proceeded on the update of water resources planning National Economic Development (NED) Manuals (a NED Overview Manual and updated guidelines on flood damage reduction and deep draft navigation). Activities also included the design of a career path template for Corps economists, and the scoping of future work on defining competence standards and training programs. The USACE Chief Economist participated in selection boards for senior economists throughout the Corps, and in the conduct of Independent Technical Reviews (ITRs) on the economics component of a complex navigation project. The USACE Chief Economist was involved in issues relating to NED evaluation of externalities and value of time saved.

**National Shoreline Management Study:** The National Shoreline Management Study (NSMS) is a collaborative, interagency effort to determine the extent and cause of shoreline erosion along the coasts of the U.S. The NSMS is also assessing the national level economic and environmental impacts of such erosion, and is examining the appropriate Federal and non-Federal roles and policies in shore protection activities. The five study workgroups are co-chaired by a mix of Corps and other Federal agency representatives. From a technical and policy standpoint, the NSMS is also assessing the use of subsystems approaches to management sediment holistically (Regional Sediment Management or RSM) in close coordination with related USACE and other intergovernmental activities, including the RSM demonstration projects being conducted by Corps districts and the ongoing coastal research of the Coastal-Hydraulics Laboratory (CHL). In FY 2005, the Shore Processes Work Group commenced development of a conceptual study, using the Gulf Coast that will describe the general level of detail and type of data available to be used by the other Work Groups to examine the economic and environmental implications of shore erosion and accretion.

**Policy Development:** The Institute conducted a range of policy development studies in 2005. The Nature of Policy Studies and Water Supply Database 2005 Update were initiated. Examples of completed studies include: Water Supply Database 2004 Survey; the Survey & Analysis of Criticisms of Corps Planning Guidance (the Principles and Guidelines) & Links to Planning Studies (the P&G); and a Regulatory Impact Analysis for Proposed Compensatory Mitigation Rule; and Achieving Environmental Sustainability. The Institute also conducted a Civil Works "provocation"

session with the HQUSACE outgoing and incoming leadership on selected water resources issues and future challenges, including an in-depth discussion of the implications to the future CW Program.

## COLLABORATION AND PARTNERING

**Environmental Advisory Board:** The Institute assumed a lead technical role in supporting the Chief's Environmental Advisory Board (EAB, a Federal Advisory Group) beginning in FY04. In this role the Institute leads a team of specialists drawn from throughout the Corps in partnership with ERDC to advise and assist the EAB as it reviews the Corps Civil Works missions, roles and business processes. Technical support in 2005 focused on the overarching theme of ecosystem restoration through water resources management. Towards that end, the Chief requested EAB review and provide recommendations on (1) the adequacy of legislative authorities for Corps ecosystem restoration; (2) the Corps application of adaptive management principles in ecosystem restoration; (3) creating an environment for improving the Corps Outreach and Partnering; (4) improving the Corps Regulatory Program; (5) alternative frameworks for determining environmental benefits, (6) methods for measuring environmental restoration project performance, and (7) the success of peer review processes implemented by the Corps.

**Inland Waterways Users Board:** The Institute continued its support of the Inland Waterways Users Board (IWUB) in FY05, including the analysis of and reporting on the financial status and capability of the Inland Waterway Trust Fund (IWTF) at meetings of the Board, and the administration of three IWUB meetings No. 47 on December 7th, 2004, in St. Louis MO, No. 48 on February 24<sup>th</sup>, 2005, in Washington, DC, and No. 49 on July 27<sup>th</sup>, 2005, in St. Paul, MN. The Institute also provided technical support to the IWUB in its development of the Board's 19<sup>th</sup> Annual report to the Secretary of the Army and the U.S. Congress, published in March 2006.

**National Outreach** IWR's FY05 technical interface activities included collaborations with a wide range of national research, professional, industry and non-governmental organizations, including: National Research Council's Water Science and Technology Board, the Transportation Research Board, and the Marine Board; the American Society of Civil Engineers (ASCE) Environmental and Water Resources Institute (EWRI) and Coasts, Oceans, Ports and Rivers Institute (COPRI); the American Water Resources Association

(AWRA); and the American Association of Port Authorities (AAPA), to name just a few.

IWR also had a very active role supporting the AWRA in the Second National Water Resources Policy Dialogue, February 14-15, 2005, which provided a forum for participants from all levels of government, as well as public and private organizations, to discuss critical water resources challenges facing the nation.

### **The Nature Conservancy Sustainable Rivers**

**Project:** Launched in July 2002, the Sustainable Rivers Project (SRP) is a nation-wide partnership between the U.S. Army Corps of Engineers and The Nature Conservancy to improve the integrity and life of rivers by changing the operations of Corps dams. The SRP is working towards this goal through a combination of partnered activities, including demonstration projects, training, software development, and a staff exchange that assigned an engineer from the Corps' Hydrologic Engineering Center to Sustainable Rivers through an IPA (Intergovernmental Personnel Act). The exchange was signed as a one year agreement and later extended for a second year, which concluded in February 2006. It was instrumental in promoting the partnership and initiating a joint software development project and a joint training program, which has now graduated students from nearly 90% of Corps Districts. After conclusion of the personnel agreement, HEC has stayed active in Sustainable Rivers and the broader Corps-Conservancy partnership and is looking for ways to continue and build on these efforts in the future.

**IWR Visiting Scholar Programs:** FY05 marked the fourth year for the Institute's Maass-White Visiting Scholar program, established in 2001 in recognition of the contributions of, and the Institute's intellectual alignment with, two of the founders of modern water resources analytical theory – Professors Arthur Maass, Harvard University and Gilbert White, the University of Chicago. FY 2005 also was the second year for two other designated visiting scholar positions: one in partnership with the Universities Council on Water Resources (UCOWR), and HEC's Roy Beard Visiting Scholar program – named after the founding director of HEC. Each of these programs seek to bring the foremost water resources experts from academia, private industry, and other agencies and laboratories to residence at IWR or HEC for periods of six months to one year. Visiting scholars are expected to help infuse new energy and ideas to the IWR program, while the practical work environment at IWR/HEC provides a stimulating context for mutual exploration of potential

advances in hydrologic engineering and planning analysis.

IWR's Maass-White Scholars have included Dr. Daniel (Pete) Loucks, Cornell University (2001-2002), Dr. Peter Rogers, Harvard University (2002-2003) and Dr. Leonard Shabman, Resources for the Future, (2003-2005), while the inaugural UCOWR Fellow was Dr. Bruce Hooper, Southern Illinois University (2004-2005), who worked on performance indicators for successful watershed-based organizations. HEC's first Roy Beard visiting scholar was Mr. Tony Thomas, founder and president of Mobile Boundary Hydraulics, followed by Dr. Jerry Stedinger, Cornell University (2005).

In FY05, IWR had other visiting scholars, including former U.S. Army Brigadier General Dr. Gerald Galloway, now a University of Maryland professor. Still a visiting scholar at IWR, Dr. Galloway is presently very active in the post-Katrina water resources policy discussion on the national scene.

## **WATER RESOURCES METHODS AND MODELS**

**Planning Models Improvement Program:** The HQUSACE Director of Civil Works approved the recommendations of the Planning Model Improvement Program (PMIP) Task Force, which was co-directed by IWR. Key HQUSACE commitments included publishing guidance in 2005 that prescribes a corporate business process and policy for the development, certification, training and on-going support for planning models, with the certification process based on internal and external peer support and review, and with the responsibility for establishing priorities and managing the certification process residing with the planning centers of Expertise, in coordination with the findings of Strategic Engineering and Technology (SET) Initiative. This policy ultimately manifested in 2005 as Engineering Circular (EC) 1105-2-407. Also key to PMIP recommendations was the coincidence with the peer review protocols being used as part of the NETS research program for navigation analysis models. In FY 05, IWR with input from other Corps laboratories and the Planning Centers of Expertise developed protocols for model certification, which includes the processes and criteria to be used for certifying planning models. The protocols are being tested on three planning models and the results will be used to finalize and publish the protocols for certification. The tests are led by IWR with the participation of the Planning Centers of Expertise.

**Navigation Economic Technologies Research:** For more than a century the U.S. Army Corps of Engineers has played a key role in maintaining a robust national economy by ensuring that farmers, manufacturers and businesses can easily transport goods up and down our nation's rivers and out to sea via coastal ports. The Navigation Economic Technologies (NETS) Research Program supports the navigation mission by developing state-of-the-art, credible, independently verified economic models, tools and techniques to be used by USACE field planners in informing investment decision-making at all levels of the agency.

To ensure that our nation's navigation system remains as efficient, effective and affordable as possible, the NETS research is aimed at developing a standardized and transparent knowledge base and associated suite of economic evaluation tools for addressing these issues. Key focus areas include: analyzing shipper behavior and responses, particularly decisions to switch to non-water modes of transportation, and assessing global market conditions, including the impact of international competition and commodity flows.

The NETS research program has two primary focal points: expansion of the body of knowledge regarding the economics underlying use of waterways and harbors, and creation of an economic decision-support toolbox of practical planning models, methods and techniques that can be applied to a variety of situations. The knowledge and tools developed by the NETS research program are based on: reviews of economic transportation and market theory; current best practices both within and outside of the Corps; data needs and availability; and peer recommendations.

In FY05, NETS research continued development of a series of practical tools and techniques for use by Corps navigation planners across the country. The centerpiece of these was a suite of simulation models that include:

- The Global Grain forecasting model. This effort demonstrates a spatial equilibrium forecasting technique that can be used in a variety of settings. As developed, it focuses on the global grain trade with a specific emphasis on Mississippi river grain flows. This model is being modified to respond to independent peer review comments.
- The Mid-America Grain study, conducted in FY04, estimated the shipper response curve for the shippers who use the Upper Mississippi. These findings have been



incorporated into a new annual model. This "Survey Model" is designed to respond to the criticisms made by the Nation Academy of Science to the structure and inputs of previous models. The Survey Model is being prepared for certification by the PCX for inland navigation.

- The survey techniques and shipper response econometric techniques that were developed for the Mid-America study where sharpened and applied to shippers utilizing the Columbia River. This is the second demonstration of the ability to estimate shipper response.
- The Oak Ridge National Laboratory has started work on the Regional Routing Model. This traffic routing model will identify annual quantities of commodities from various origins and routes used to satisfy forecasted demand at each destination.
- Significant advances were made to two microscopic event models. The beta version of the HarborSym model was release, and DDPCX-sponsored training has been delivered. The model, training material and user's guide are all available on the NETS web sit. The Navigation System Simulation (NaSS) model reached its first milestone with the publication of the draft design document. This document is being revised to respond to independent peer review comments.
- Model communications have been enhanced with the development of animation and visualization tools. For the inland waterways, the Inland Navigation Animation Module (INAM) will allow for the visualization of LPMS data and, in the future, Navigation System Simulation analysis. The HarborSym Animation Model (HSAM) animates HarborSym analysis. These features greatly facilitate model calibration and communications.
- Work has begun to incorporate NETS research findings into legacy models. In conjunction with the Oak Ridge National Laboratory, NETS is working to incorporate "shipper response" into the Ohio River Navigation Investment Model (ORNIM). This effort will remove from the model the need for perfectly inelastic demand curves. In a related effort, NETS is working with the PCX for inland navigation to conduct surveys to estimate the

shape of the shipper response curves on the Ohio River. These inputs will be needed for the modified version of ORNIM.

Looking forward to 2006, NETS is transitioning from research to practice. However, many areas of research remain. The HarborSym channel-widening model is now being used in field study, while the NETS team extends its functionality to include channel-deepening analysis. We will conduct shipper response surveys on the Ohio, and again on the Upper Mississippi, while incorporating shipper response into the Survey Model for use by the Upper Mississippi study team. The NETS team will further develop the spatial equilibrium-forecasting tool, while the Upper Mississippi study team adopts the Global Grain application for study use. Continued development of the Regional Routing Model and the Navigation System Simulation Model will produce prototypes in FY06. The NETS team continues to focus on outreach and communications with the NETS web site, NETS Newsletter and participation at conferences around the world.

**Cost Effectiveness and Incremental Cost Analysis:** The Institute deployed an updated version of IWR-PLAN (Version 3.33), which is a water resources investment decision-support tool that performs cost-effectiveness and incremental cost (CE/IC) analyses associated with the formulation and evaluation of planning alternatives which produce non-monetary or a combination of monetary and non-monetary outputs. Developed in partnership with the Social Sciences Institute and the Department of Interior's Natural Resources Conservation Service (NRCS), IWR-PLAN was originally designed to assist with the development and comparison of alternatives plans for ecosystem restoration and watershed planning studies. However, the program can now be applied to a wide variety of integrated water resources planning and management (IWRM) problems by helping identify which plans are the best financial investments by displaying and comparing the effects of each plan on a range of decision variables.

**Transportation Systems:** IWR's Transportation Systems program supports Corps districts and HQUSACE in accomplishing navigation project planning and valuation responsibilities through the provision of uniform, consistent maritime transportation data on the operation and replacement of commercial waterborne vessels and comprehensive statistics on the composition of the world deep draft fleet and world trade and cargo flow forecasts. Accomplishments for FY 05 include updated vessel fuel costs; world trade and commodity flow forecasts; update and distribution of materials from various subscriptions; update of the

Inland Waterway Review, including cargo trends and lock and dam operations and investments throughout the inland navigation system, and updated barge, rail and truck alternative transportation modal models

**Flood Damage Data:** The Institute's Flood Damage Data program provides a centralized, consistent and cost-effective database of depth damage data for use by all USACE district planners. The Program's main objective is to conduct and consolidate actual flood damage surveys following flood events for both coastal and riverine events. Accomplishments in FY05 included the design, testing and release of updated OMB approved questionnaires for the field conduct of flood damage surveys, the development of generic business depth damage relationships, and the collection of data and development of a model for estimating damages to roads.

**National Economic Development Manuals:** In FY05, IWR continued the development of revised National Economic Development Manuals for flood damage reduction, deep draft navigation and storm damage prevention (coastal). The manuals provide a description of procedures and tools for use in the economic evaluation of water resources projects and are an invaluable tool for Corps economists and planners. A draft of the flood damage reduction manual was completed in FY 05 and is under review by field planners. A main component of this effort is the publication of the manuals as web-based tools. The development of a prototype of the web-based manual was initiated in FY 05.

**System-Wide Water Resources Research:** FY2005 was marked by a major joint effort of IWR, led by HEC, with the Engineer Research and Development Center (ERDC) laboratories in shaping the new System Wide research and development program, a program focused on expanding the view of research activities to the 'System Wide' perspective, reflecting a concerted effort by USACE to better work consistent with concepts of sustainable development in a watershed context. The effort has thus far been most successful, portending the development of new and exciting products for field office use in the coming years. It should be noted that most of the IWR software and new methods development is funded from this and other USACE civil works research programs.

**NexGen Software:** HEC-HMS version 3.0 was released in early 2006. This release constitutes a major update to HMS. There are many new features as well as a completely new user interface that provides newly designed functionality. Besides replacing the

proprietary user interface, new technical features include automated frequency curve development, the addition of snowmelt capability, and incorporation of interior flooding simulation capability. The companion GIS utility package (HEC-GeoHMS) is being updated and new features added to prepare for a parallel release with the new HMS version. This utility provides substantial capability to effectively use national terrain data sets to rapidly develop HEC-HMS models.

At the end of fiscal year FY04, final touches were being put on HEC-RAS (Version 3.1.3) for release in May 2005. Work on adding sediment transport began in FY05 and a release with sediment capabilities is slated for FY06. The companion GIS utility package (HEC-GeoRAS) has also undergone improvements and was released simultaneously with HEC-RAS Version 3.1.3.

The major flood damage and risk analysis software package, HEC-FDA, continues to be improved, with progress made in nonstructural measures and GIS capabilities into the risk analysis program HEC-FDA. The projected release schedule for the new version is late in fiscal year 2006.

The new features added to the reservoir simulation program HEC-ResSim were substantially completed in FY04. These features included system hydropower and pump-back storage operations, period-average flow requirements, conditional (if-then-else) rule evaluation, scripted state variables and rules, and user-defined reports. In FY05, the new and existing features were extensively tested and refined. Because outstanding issues—including uncontrolled spillway overflow and long-interval (daily) operation—have yet to be resolved, the projected release schedule for the new version has been delayed to the 4th quarter of fiscal year 2006.

Under development for several years, a new program coined HEC-EFM (ecosystem functions model) is emerging as a valuable link between traditional flow-based watershed analysis and ecosystem response. A release is planned in FY 2005.

Another new initiative begun in FY 2004 and carrying through FY 2005 has been coined HEC-WAT, Watershed Analysis Tool. This software will be the integration environment for HEC models, and later program packages developed by others. The HEC models of RAS, HMS, ResSim, FDA, and EFM are to be seamlessly linked in the WAT system. WAT is scheduled for a beta release and on-site workshop at HEC in summer 2006.

## INTEGRATED CIVIL WORKS SYSTEMS

**OMBIL:** NDC's production databases provide water resources facility inventories, outputs, and activities that are integrated into a centralized performance management information system – the Operations and Maintenance Business Information Link (OMBIL). OMBIL encompasses the Civil Works businesses of navigation, hydropower, recreation, environmental compliance, natural resources and regulatory. These data are combined and internally distributed through OMBIL decision support system to support a variety of Corps management initiatives, as well as federal and public data requirements.

In support of the Civil Works business performance measurements, NDC extracts expenditure data from CEFMS and combines it with the different business output data to generate efficiency and effectiveness measurements. These measurements are for both internal use in the Corps <https://ombil.usace.army.mil> and submission to higher authority including the Office of Management and Budget (OMB). Also, NDC data supports and is a source for the Corps "Value to the Nation" and the federal government's recreation access site "rec.gov".

The navigation data has been integrated with CorpsMap that provides an intranet web-based GIS interface. This web site includes many of the Corps other data layers such as Digital Project Notebook, Inventory of Dams, Bridge Inventory Database, Division and District Boundaries and Real Estate Holdings plus many standard layers such as state, county, congressional district, zip codes and etc.

All of NDC's publicly available navigation and water transportation data is available via a single gateway at [www.iwr.usace.army.mil/ndc](http://www.iwr.usace.army.mil/ndc) or on its annual CD-ROM. The site also provides links to other Corps, Federal and public sites related to the navigation business. NDC continues to strive to provide single site portals related to various management views for accessing all data and information

**CWMS:** The project to modernize the Water Control Data System (WCDS) software began in FY 1997. Renamed CWMS or Corps Water Management System, and formally identified as an Army AIS, CWMS was fielded in its first operational state in 2002/2003. Since that time, the system has been updated at roughly annual intervals at the thirty plus USACE offices with water control management responsibilities. CWMS supports field-level decision-making within the Corps water management

mission. It embodies data acquisition, validation, transformation and management; forecasting, simulation and decision support analysis; and information dissemination. Improvements to the system continue via a field-prioritized betterments program. The current fielded version of CWMS (v 1.4) was released in January 2006. Improvements over the preceding version include the addition of snow-melt modeling, several new features in HEC-ResSim, the capability of storing, retrieving, and editing rating table information, upgraded data stream processing, new security features, and visualization scaling. The management and funding structure provides for a modest field-directed betterments program that will be ongoing throughout the life cycle of CWMS. Currently, version 2.0 is under development with a planned release near the end of 2006. Version 2.0 will include important revisions to the basic database structures, allowing users within water control more direct access to their data and enabling them to make more effective use of the features inherent in the commercial Oracle database at the center of CWMS. Information about CWMS and other HEC software is available on the HEC Web site: <http://www.hec.usace.army.mil/cwms/>.

## WATER RESOURCES TRAINING AND EDUCATION

**PROSPECT Program and Specialty Workshops:** IWR continued the USACE PROSPECT training program rebound by presenting twenty-three week-long courses (twelve led by the IWR NCR and eleven by HEC) and five field workshops that totaled an additional five weeks of training. The courses covered a wide range of civil works water resources topics: Public Involvement and Teaming in Planning; Public Involvement – Communications; Regulatory for New Regulators; Regulatory - Procedural Issues; Regulatory - Decision-Making; Regulatory Executive Seminar; Eco-system Restoration Planning/Evaluation; Economic Analysis; and a full menu of hydrologic engineering and planning analysis topics including courses on HEC-RAS, HEC-HMS, GIS applications, watershed/river and wetlands restoration courses, and advanced courses in unsteady flow and HMS applications. Attendance averaged about 25 students per course.

The specialty workshops focused on HEC software such as HEC-ResSim, HEC-RAS, HEC-HMS and HEC-DSSVue; the use of navigation data and information systems; IWR-PLAN and cost effectiveness and incremental cost analysis (CE/IC); and IWR-MAIN and water supply forecasting.

**Planning Excellence Program:** Throughout FY 05 IWR provided managerial and technical support to the Civil Works Planning Community-of-Practice in the execution of the Planning Excellence Program. This included the management of the Planning Associates Program and the conduct of the two-week "Washington-Experience" orientation for the FY05 class. The goal of the Program is to develop planning leaders who can manage complex planning studies that lead to quality decision documents and who will provide water resources technical and professional leadership in the future. IWR, in coordination with HQUSACE, is responsible for the implementation of the Program including the selection of candidates, development and delivery of training sessions, financial management and logistical support. .. IWR also provided support to the local delivery of selected Planning Core Curriculum Courses by the Corps MSC's. These eight courses provide the basic, full performance training needed by entry level planners across the USACE as the means to accelerate their progress to the journeyman stage of their career development.

#### **REIMBURSEABLE TECHNICAL ASSISTANCE**

Reimbursable project work was undertaken for Corps field offices as well as HQUSACE Civil Works Planning, Engineering, Operations-Regulatory, and Office of Homeland Security; the HQUSACE Office of Interagency and International Activities; the Corps Engineering Research and Development Center - Coastal and Hydraulics and Environmental Labs; the Federal Emergency Management Agency; the International Joint Commission; the National Oceanic and Atmospheric Administration (National Weather Service), the Department of Interior (USGS), and other Federal agencies, along with approved Thomas Amendment Agreement technical support to the Lower Colorado River Authority, Texas, and the Tampa Bay Water Authority, Florida. Other projects for IWR's USACE clients included navigation systems economic evaluation, technical advice and guidance on plan formulation, incremental cost and cost effectiveness (IC/CE) analysis, risk analysis, watershed and reservoir system modeling, water quality, river hydraulics, wetlands hydrology, water control management, regional statistical analysis, flood damage analysis, flood warning response systems, GIS applications in hydrology and hydraulics, groundwater modeling and water supply in support of interagency investigations.

The most notable reimbursable projects included the completion of the five-year, \$20 million Lake Ontario and St. Lawrence River Study for the International Joint Commission (IJC), which demonstrated the practical application of contemporary IWRM planning concepts and modeling techniques; the completion of Phase 1 modeling of the Tigris-Euphrates Rivers basin, and subsequent extension of the watershed model which included the reconstruction of historical data and completion of the draft Integrated Marsh Restoration Program (IMRP) report; and partnering with (1) USACE ERDC on the provision of capacity building training for staff of the Iraq Ministry of Water Resources, and (2) with the U.S. Geological Survey in providing stream gage installation and training to the Ministry of Water Resources in Iraq.

#### **CIVIL WORKS PROGRAM AND PROJECT INFORMATION**

IWR provides a full range of information on key Civil Works activities including international, national and Corps-wide data and information. National water resources database concept development, design, implementation, operation, and maintenance activities are provided through a combination of in-house and private sector systems analysts, statisticians and engineers/scientists who work in close coordination with Corps users.

**Navigation Data Center:** The Navigation Data Center (NDC) is the central manager of navigation data for the Nation, and NDC provided information directly supports the Corps \$1.8 billion annual navigation program in addition to all other CW programs. NDC is responsible for national level executive oversight and management responsibilities such as the development of both federal and Corps policy and guidance involving Engineering Regulations and the Code of Federal Regulations and their enforcement. The Office of Management and Budget, acting on legislative mandates, recognizes USACE, acting through NDC, as the Federal collection agent for waterborne commerce, vessel activities and waterway infrastructure data and statistics.

NDC accomplishes its objectives of supplying timely and accurate data through the following activities: 1) Assessing user requirements; 2) developing, designing, and operating and maintaining systems to collect, process, and store data and information; 3) developing and disseminating data, information and statistics products; 4) training of

providers and users; 5) maintaining technological and content interoperability and currency.

As a national statistical center, NDC coordinates extensively with other federal statistical agencies and federal data users, and represents the U.S. Government with foreign governments in the development of data and information standards and protocols; and in the negotiation of data exchanges. Within the Corps NDC actively participates in corporate information integration and coordination and plays a lead role in developing, coordinating and disseminating water resources information for performance measurement and management purposes, and in assisting in the development of strategic communication with both internal communities of practice and external water resources interests, stakeholders and communities. Key information and data provided in FY04 include:

**Waterborne Commerce and Vessel Statistics:** Under the authority of the River & Harbors Act of 1922, as amended, and codified in 33 U.S.C. 555 the Corps is to collect, process, distribute, and archive commercial vessel trip and cargo data. These data and statistics are used to analyze the feasibility of new water transportation projects and activities; to set priorities for new investment and rehabilitation; and for management of the operations and maintenance of existing projects.

Under Federal law, vessel-operating companies must report domestic waterborne commercial vessel movements directly to the Corps. The types of vessels include: dry cargo ships and tankers, barges (loaded and empty), towboats (with or without barges in tow), tugboats, crew boats and supply boats to offshore locations, and newly constructed vessels from the shipyards to the point of delivery. Vessels remaining idle during the monthly reporting period are also reported.

U.S. Foreign waterborne import, export, and in-transit cargo and vessel movement data are provided to the Corps by the U. S. Customs Service, the Bureau of the Census, and the Port Import Export Reporting Service.

Movement data acquired by the Waterborne Commerce Statistic Center of NDC is primarily for the use of the Corps and other governmental agencies. In 2004 these data were incorporated into the Corps budget preparation process and provide the navigation project outputs and performance measures used to rank and justify operation and maintenance funding requests. Summary statistics, which do not disclose movements

of individual companies are also released to private companies and to the general public.

The Waterborne Commerce Statistics Center's standard publication, *Waterborne Commerce of the United States*, is issued in five parts (Atlantic Coast, Mississippi Valley and Gulf Coast, Great Lakes, Pacific Coast, and a National Summary). Also available is *The Public Domain Database* that contains aggregated origin to destination information of foreign and domestic waterborne cargo movements.

*Transportation Lines of the United States* in three volumes contains a national summary of U.S. vessels, listings of domestic vessel operators, plus details their equipment and references their service areas.

**Navigation Infrastructure Inventory:** This information supports the Corps Federal Central Collection Agency responsibility for documenting the nation's commercial port infrastructure served by Federal channels. In 2005 data for the Virginia ports of Hampton Roads and the James and York Rivers; the ports of southwest and western Alaska; the ports on the Illinois waterway; the port of St Louis, MO and the Upper Mississippi; the ports of Memphis, TN, Helena, AR, Natchez, Vicksburg, Greenville, MS and ports on the Lower Mississippi were updated in the central database. Data for over 9,280 individual docks are available in published reports and on the Internet in summary form and as data files. These data are updated and posted as each port area is re-surveyed and verified as current. A new initiative to survey, for the first time, the ports of Southern Louisiana (west of New Orleans and east of Lake Charles, LA) was begun. The data are used to identify industry served by the federal channels and is part of the budget process prioritization of projects. The Coast Guard is also a prime user of the information in the execution of their homeland security mission.

Another initiative is the establishment of a central database of all Corps navigation projects (Navigation Project Profile) with the critical attributes required for the budget process prioritization process. This information is used in the Operations and Maintenance Business Information System (OMBIL) to more fully describe all aspects of a project

**Lock Performance and Characteristics:** The lock performance database provides the Corps access to individual lock near real-time information as well as summary and performance statistics. A national data warehouse was fully deployed in FY 2005 and provides all Corps users direct access to current and historical

data and summaries. The data are used by the Corps and other agencies such as the Coast Guard and the TVA in the execution of their missions. Lock characteristics, the physical descriptions of all the Corps owned/operated locks, are available on the web to all users. The lock databases are feeder systems to the Operations and Maintenance Business Information System (OMBIL) decision support system.

**Dredging Statistics:** This web-based ORACLE database is successful in supplying information on all USACE performed and contracted dredging to the Corps, industry and private users. Data entry and report generation is accomplished via the Corps Intranet and enables all Corps members access to the information in the central system. The data are used to generate the Small Business Report for dredging contracts. Biweekly reports are posted on the public web site to inform the industry and public of Corps and contracted dredging activities. Standard reports and summaries plus custom queries and reports are quickly generated to meet Corps and user needs. The use of the information by Corps and industry has resulted in improved bidding competition and a more efficient utilization of dredging equipment. The dredging database is a feeder system to the Operations and Maintenance Business Information Link (OMBIL) decision support system.

All of NDC's publicly available navigation and water transportation data is available via a single gateway at [www.iwr.usace.army.mil/ndc](http://www.iwr.usace.army.mil/ndc) or on its annual CD-ROM. The site also provides links to other Corps, Federal and public sites related to the navigation business. NDC continues to strive to provide single site portals related to various management views for accessing all data and information. Most data are available in both hard copy and electronic form.

**Water Supply:** IWR partnered with Corps MSC's and district offices in FY05 to initiate a study to update the 2004 water supply database (published as IWR Report 05-PS-1). The 2004 database showed there were 134 Corps multipurpose projects that included 9.86 million acre-feet of municipal and industrial (M&I) water supply with a repayment value of \$1.477 million. The Corps has 295 water supply agreements that cover all but about 8% of these costs. The 134 reservoirs are located in 25 states plus Puerto Rico and in 23 of the Corps' 38 districts.

IWR also continued act as the Headquarters' Water Supply Business Program Manager. In this role, the water supply portion of the FY 07 budget was developed through the use of new water supply work category codes. The Presidents' FY 07 budget included

\$2.83 million for the water supply program, up from \$2.0 million in FY '06. As the Water Supply Program Manager, IWR also initiated a water supply data call to develop the joint-use costs associated with multiple purpose water supply projects and participated in the HQUSACE "O&M Joint Cost Project Delivery Team."

## INTERNATIONAL WATER RESOURCES

The International Lake Ontario-St. Lawrence River Study continued to be conducted by the International Joint Commission (IJC) to assess and evaluate the Commission's *Order of Approval* used to regulate outflows from Lake Ontario through the St. Lawrence River. This five-year, \$20 million study is evaluating the impacts of changing water levels on shoreline communities, domestic and industrial water users, commercial navigation, hydropower production, the environment and recreational boating and tourism, along with forecasted effects of climate change. The study is being conducted in full partnership with Canada, and is utilizing a transparent planning process pioneered by IWR and known as "Shared Vision Planning". The open citizen and public participation process is being guided by a volunteer Public Interest Advisory Group (PAIG) appointed by the IJC, while the study team is composed of a broad assembly of multi-disciplinary technical experts on nine technical working groups and led by co-director's from Canada and the U.S. The U.S. co-director is Dr. Eugene Stakhiv of IWR.

During FY05 a series of alternative plans continued to be developed and refined. State-of-the-art models that assessed impacts on erosion, ecological processes, recreational boating, and navigation were developed and presented to basin interests in the U.S. and Canada. Feedback continued to be received on the range of alternative plans which were narrowed during this period to a smaller subset of candidate plans. These were then further coordinated with the public as the Study Board continues towards the approval of its report to the Commissioners in 2006.

**World Water Council:** The CECW Deputy Director for Civil Works represents the USACE on the World Water Council (WWC), with IWR providing technical support and representation on the Council's Institutions and Governance Committee. FY05 activities included the continued planning for the 4<sup>th</sup> World Water Forum (WWF) which will be held in Mexico City in March 2006, and the development and coordination of USG input into the construct of the 4<sup>th</sup> WWF agenda,

consistent with Department of State guidance on international water initiatives and USG policy, such as the Millennium Declaration Goals. IWR deployed a water resources manager to Mexico City in February 2005 to represent the USG in its on-site planning for the 4<sup>th</sup> WWF.

**USACE – UNESCO IHE Partnership:** IWR is the USACE technical agent for administering the Memorandum of Understanding (MOU) between the USACE and UNESCO - Institute of Water Education (IHE). The most significant activity in FY05 was the continued training of 18 month in-residence Master’s Degree water specialists from the Iraqi Ministries of Water Resources and Public Works at the IHE-Delft, Netherlands.

**UNESCO – IHP:** The IWR director was part of the United States Government (USG) delegation attending the 16<sup>th</sup> Session of the UNESCO International Hydrologic Programme (IHP) Intergovernmental Council in Paris, France, 20-25 September 2004. This delegation represented the USG as part of the process of re-establishing the U.S. IHP National Committee, which formerly began in 2005 in conjunction with the formation of the U.S. National Commission upon the USG reentry into UNESCO.

**USACE - Dutch Rijkswaterstaat Memorandum of Agreement:** The Dutch Rijkswaterstaat (RWS) and the USACE signed a Memorandum of Agreement (MOA) in May 2004. The scope of that agreement encompasses collaboration in research, development, testing, and evaluation potentially leading to new and/or improved capabilities between the two countries. IWR has the technical lead in the implementation of MOA activities. Upon the signing of the MOA, a strategy was developed to focus the technical exchange along practical lines that were mutually beneficial to the missions of both organizations. Accordingly, six specialty (cluster) areas were formed with co-leaders from both countries identified to lead each specialty area:

- Flood control and flood protection
- Coastal zone management
- River basin management
- Shipping and transport
- Dredging
- Infrastructure management

Several technical exchanges took place in FY05 in both the US and The Netherlands, along with a follow-up visit to the U.S. where the USACE hosted a visit by the RWS Director-General, with joint events in both

Washington, D.C. and New Orleans, Louisiana. Following Hurricane Katrina activities associated with the MOA were primarily re-directed to focus on flood protection measures, coastal zone development and US-Dutch approaches to risk assessment. Several directed exchanges are planned for FY06.

**International Technical/Reimbursable Projects:** FY 2005 continued to yield major growth in technical assistance projects undertaken in cooperation with non-Corps, non-Federal organizations. This includes work in Iraq and Afghanistan for USAID and its contractors, and local government agencies. Projects for these varieties of clients and settings include watershed and reservoir system modeling, water quality, river hydraulics, wetlands hydrology, water control management, regional statistical analysis, GIS applications in hydrology and hydraulics and groundwater modeling.

#### **INTERNATIONAL NAVIGATION ASSOCIATION (PIANC)**

PIANC is an organization consisting of approximately 40 national members. From its headquarters in Brussels, Belgium, it acts as a clearinghouse of technology and experiences relating to ocean and inland navigation improvements which are exchanged among engineers, scientists, port operators, and marina and vessel owners, to name a few. Its objective is to advance, on a worldwide basis, the sustainable development of all kinds of navigation through the exchange of technical information on port and waterway development. The objective of the Association is met by holding International Congresses and by publishing technical bulletins and special reports. Special reports are published describing the results of the work of international research teams, or working groups, composed of those national members interested in the particular subject under study. The organization also serves as an excellent source of identifying individual and corporate expertise throughout the world on PIANC-related subjects. Personal interchange of ideas and information also is promulgated by members attending the International Congresses held once every four years, and technical working group meetings held several times each year.

The business affairs of the Association are managed by the Annual General Assembly (AGA). It is composed of delegates who represent each member government. The number of delegates is determined by the size of the national membership, but may not exceed 11 per country.

The United States (U.S.), which has been a member of PIANC since 1902, provides an annual appropriation for the support and maintenance of the organization. This includes an annual subvention to PIANC International and payment of a portion of the travel expenses of officially appointed national delegates (Commissioners) of the United States to meetings of the AGA and Congresses. Total annual appropriation for the U.S. Section, PIANC is currently \$45,000, including the annual subvention of approximately \$15,000.

The U.S. Section is administered by law, under the auspices of the Department of the Army (Corps of Engineers). It is located in the Institute for Water Resources (IWR), Casey Building, Humphreys Engineer Center. The U.S. Section is composed of both individual and corporate members who pay membership dues. Membership of the U.S. Section on September 30, 2004, totaled 263, consisting of 216 individual members, 46 corporate members and 1 student member.

**United States National Commission:** The United States National Commission constitutes the governing body of the National Section. In 2004 the ex-officio officers of the U.S. National Commission were: Chairman, John P. Woodley, Jr., Assistant Secretary of the Army (CW); President, MG Don T. Riley, Director of Civil Works; and Secretary, Mr. Ronald R. Conner an employee of IWR.

In 2004, U. S. National Commissioners were: Mr. Robert D. Nichol, President, Moffatt and Nichol Engineers; Mr. Kurt J. Nagle, President, American Association of Port Authorities; Mr. Charles C. Calhoun, Jr., Vice President representing the Central Region and consultant; Dr. Robert H. Randall, Texas A&M University; Mr. Joseph H. Pyne, President, Kirby Corporation; Ms. Doris J. Bautch, Director, Great Lakes Region, Maritime Administration, U.S. Department of Transportation; Mr. Shiv Batra, Vice President representing the Western Region and President, INCA Engineers, Inc.; and Mr. Thomas H. Wakeman, III, Vice President representing the Eastern Region and General Manager, Waterways Development Division, Port Commerce Department, Port Authority of New York and New Jersey.

Mr. John P. Woodley, Jr., Assistant Secretary of the Army (Civil Works) continued to serve as Chairman, U.S. Section PIANC... Major General Don T. Riley continued to serve as President of the U.S. Section. Mr. Bruce Lambert replaced Mr. Ron Conner

as Secretary of the U.S. Section during the summer of 2005.

**PIANC Activities:** In February of 2005, Mr. John P. Woodley, Jr. made a presentation to the American Association of Port Authorities Latin American Executives Meeting in Miami, Florida. This activity was part of the Inter-American Initiative being led by the U.S. Section PIANC. The U.S. Section, jointly with the AAPA, developed a survey on dredging and technical port needs that was distributed to AAPA's Latin American and Caribbean members.

In May of 2005, the U.S. Section hosted the PIANC International Annual General Assembly in Charleston, S.C. The U.S. Delegation composed of Mr. Woodley, MG Don T. Riley, Mr. Ronald Conner, Mr. Shiv Batra, Ms. Doris Bautch, Mr. Charles Calhoun, Mr. Kurt Nagle, Mr. Harry Cook, Mr. Robert Nichol, Mr. Tom Wakeman, and Mr. Thorndike Saville attended the Annual General Assembly in Fukuoka, Japan. Dr. Robert Engler and Dr. Sandra Knight also attended. The major resolution was entitled "PIANC for the Americas", which supports the U.S. Section Latin American Initiatives. The U.S. Section also hosted a technical meeting, with a morning session on Latin American port issues, and an afternoon section on various research topics in the U.S. The U.S. Section also signed a Memorandum of Understanding of the AAPA, to work jointly on technical assistance with Latin American regions.

The U.S. Section PIANC (International Navigation Association) held its Annual Meeting October 20, 2004 in Baltimore, Maryland. A morning business meeting was followed by an afternoon seminar on Container-on-Barge Transport: Implications for Navigation Infrastructure. The U.S. Section Commissioners also held a meeting during this event.

Other major efforts that began in 2005 are the development of a new strategic plan for the U.S. Section of PIANC, a Memorandum of Understanding with the Organization of American States, Inter-American Committee on Ports, and .

The second U.S. Section PIANC Scholarship was awarded to Mr. Nicholas Zager, a top junior Ocean Engineering student at Texas A & M University.

The U.S. winner of the 2005 DePaepe-Willems Award was Mrs. Shana Heisey of the Institute for Water Resources, U.S. Army Corps of Engineers.



**Representatives to Committees and**

**Commissions:** The principal business of PIANC is the sponsorship of technical working groups. The U.S. Section is represented by Principal and Co-Principal Members of the Commissions managing the activities of the technical working groups. The representatives were:

**Environmental Commission** – Mr. Edmond Russo, U.S. Army Corps of Engineers, New Orleans District (U.S. Principal Representative), and Dr. Robert Engler, Engineer Research and Development Center (Chairman of the Environmental Commission).

**Inland Navigation Commission** – Mr. Shiv Batra, President of INCA Engineers, Inc. (U.S. Principal Representative) and Dr. Sandra K. Knight, P.E., USACE, Engineer Research and Development Center (Chairman of the Inland Navigation Commission).

**Maritime Navigation Commission** – Mr. E. Dan Allen, Moffatt & Nichol.

**Recreational Navigation Commission** -- Mr. Richard B. Dornhelm, Moffatt & Nichol; Co-Principal, Jack C. Cox, TetraTechFW.

**New Technical Working Groups:**

In 2005, nine new Working Groups were formed. The groups are listed below along with the name of the Principal U.S. Representative.

**InCom 29** Innovations in Navigation Lock Design  
David Schaaf, USACE, LRL and Dale Miller, INCA Engineers

**InCom 30** Inventory of Inspection and Repair Techniques of Navigation Structures (Steel, Concrete, Masonry and Timber) both Underwater and In-the-Dry  
Ron Heffron, Moffatt & Nichol

**InCom 31** Organization and Management of river ports,  
Mr. Jim McCarville, Port of Pittsburgh

**MarCom 49** Horizontal and Vertical Dimensions of Fairways  
Michael J. Briggs, USACE, ERDC

**MarCom 50** General principles for the design of maritime structures  
Bill Paparis, HPA

**MarCom 51** Water injection dredging

Timothy L. Welp, USACE, Research & Development Ctr.

**MarCom 52** Criteria for the (Un-)Loading of Container Ships  
Dan Allen, Moffatt & Nichol Engineers

**MarCom 53** Design and construction of maritime structures in tsunami prone areas  
John R. Headland, Moffatt & Nichol Engineers, Michael J. Briggs, USACE, ERDC

**EnviCom 15** Environmental Aspects of Dredging and Port Construction Around Coral Reefs and Cold Water Hard Bottom Benthic Communities  
Penny L. Cutt, USACE, Jacksonville District

**Working Group Reports Published in 2005:**

**InCom 21** Economic aspects of waterways

**MarCom 44**, Accelerated Low Water Corrosion (+ cd-rom)

**MarCom 36** Catalogue of Prefabricated Elements (+ cd-rom)

**MarCom 34** Recommandations relatives aux normes parasismiques pour les structures portuaires

**RecCom 10** Systèmes d'amarrage pour la navigation de plaisance

**EnviCom 08** Biological Assessment Guidance for Dredged Material

**EnviCom 02** Bird Management in Ports and Waterways

**Active Working Groups and the names of the U. S. Representatives:**

**InCom WG 23, Technical and Economic Problems of Channel Icing.**  
Mr. Claude Strauser, USACE District, St. Louis.

**InCom WG 25, Maintenance and Renovation of Navigation Infrastructure.**  
Dr. James McDonald, USACE-ERDC (retired) was the U.S. representative and chaired the committee. Mr. James Blanchar, USACE-MVR (retired) served as corresponding member.

**InCom WG 26, Design of Control Structures Used on Navigable Waterways: Controllable Weirs and Gates.**

Mr. Dale Miller, INCA Engineers and Dr. Richard Stockstill, USACE-ERDC

**InCom WG 27, Guidelines for Environmental Impacts of Vessels.**

Dr. Thomas Keevin, USACE-St. Louis District

**MarCom WG 36, Catalogue of Precast Elements.**

Dr. Billy L. Edge, Texas- A&M University

**MarCom WG 39, Monitoring of Breakwaters.**

Mr. James D. Prehn, RLS, Special Data Survey

**MarCom WG 42, Life Cycle Management of Port Structures – Implementation Manual.**

Dr. Valery M. Buslov, Hans-Padron Associates

**MarCom WG 43, Minimizing Harbor Siltation.**

Dr. John Headland, Moffatt & Nichol

**MarCom WG 44, Accelerated Low Water Corrosion.**

Dr. Ashok Kumar, USACE-ERDC

**MarCom WG 45, Post Earthquake Actions for the Restoration of Port Structures.**

Dr. Stephen Dickenson, Oregon State University

**MarCom WG 46, Maritime Freight Transshipment.**

Ms. Doris Bautch, Maritime Administration, U.S. Department of Transportation

**MarCom 47, Criteria for the Selection of Breakwater Types and their Optimum Damage Risk Level.**

Dr. Jeffrey A. Melby, USACE ERDC

**MarCom WG 48, Guidelines for Port Constructions, related to Bowthrusters.**

Mr. Marcel Hermans of the Port of Portland and Mr. Gary Greene, Gary Greene Engineers.

**RecCom WG 14, Access to Sport and Recreation Boating for Persons with Disabilities.**

Mr. Daniel Natchez, Daniel S. Natchez and Associates, Inc

**RecCom WG 15, The Use of Alternative Materials in Marina Construction.**

Mr. Terrence Browne, Collins Engineering

**RecCom WG 16, Protecting Water Quality in Marinas,**

Mr. Jack Cox , TetraTechFW and Mr. David Dykstra, Moffatt & Nichol

**RecCom WG 17, Guidelines for Marina Design,**

Mr. Dennis Kissman, Marina Mgt. Services, Inc.

**EnviCom WG 9, Environmental Impacts of Polar Marine Activities.**

Jon E. Zufelt, Ph.D., USACE, ERDC, Cold Regions Research Engineering Laboratory.

**EnviCom 10, Environmental Risk Assessment in Dredging and Dredged Material Management.**

Dr. Jerome Cura, Menzie-Cura & Associates

**EnviCom 11, Management, Dredged Material Re-use and Transformation of Existing Confined Disposal Facilities.**

Dr. Michael Palermo, USACE-ERDC

**EnviCom WG 12, Sustainable Waterways within the Context of Navigation and Flood Management,**

Dr. Craig Fischenich, U.S. Army Engineering Research and Development Center and Mr. John D. Clarkson, USACE, Huntington District

**EnviCom Experts Group 2 , Environmental Benefits of Waterborne Transport.**

Dr. David A. Moser, USACE, Institute for Water Resources

**EnviCom WG 13, Best Management Practices Applied to Dredging and Dredged Material Disposal Projects for Protection of the Environment.**

Mr. Thomas Wang, Anchor Environmental LLC and Dr. Douglas Clarke, USACE ERDC

**EnviCom WG 14, Dredged Material Beneficial Use Options and Constraints.**

Mr. Richard F. Gorini, J. Simmons Group