Volume 14 — July 2009

The *Navigation eNews* is issued every two months. We hope it is an easily perused, useful newsletter. Please send us a paragraph or two when you've something to share with the navigation community: *dinah.n.mccomas@usace.army.mil*. All issues are available on the Navigation Gateway, *http://operations.usace.army.mil/navigation.cfm*.

Contents

The IMTS Story

John LaRandeau, NWD, Mark Hammond, LRH

The Inland Marine Transportation System (IMTS) was created to implement improvement ideas from the marine transportation workforce and industry. This innovation provides a process and structure to help assure ideas are successfully implemented. No new national organization is being formed, and there will be no major disruptions of the workforce. Rather, the IMTS will use existing people in virtual teams and will strengthen the existing chain of command. The IMTS is committed to an open process with strong communication links and to making serious efforts to get input from the IMTS workforce and users on draft implementation plans and documents.

The IMTS Concept and improvement ideas came from a Business Process Review (BPR) study performed by a team of skilled experts from across USACE, including Operations (Ops) Chiefs, Ops Managers, lockmasters and others. The team gathered improvement ideas on business processes from both the workforce and industry. There were open forums, listening sessions with industry, and newsletters. Team members visited almost every project site to interact personally. The study was highly successful. 125 different improvements ideas were identified and grouped into 25 BPR topics. The newly-formed IMTS Working Group moved quickly and is presently working on implementing the ideas in the first five BPR topics.

The IMTS is committed to aggressively communicating to both the workforce and industry users through newsletters, briefings, e-mail, and a web site. The IMTS Newsletter is available on the USACE Navigation Gateway, *http://operations.usace.army.mil/navigation.cfm*. The BPR Study Report, available at *http://www.navlocks.usace.army.mil/ report.htm,* explains the 125 improvement ideas in detail. There is also an e-mail address for people to send comments or suggestions, *IMTS@usace.army.mil*.

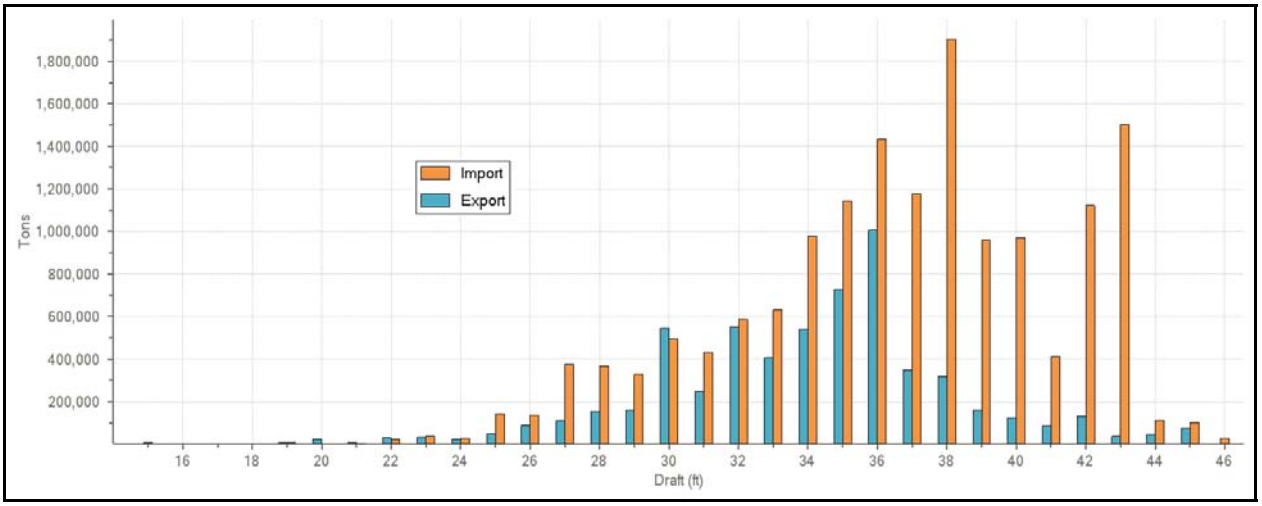
ERDC Researchers Win Top Awards at WEDA 29/TAMU 40

Lyndell Hales, CHL

Five engineers from the U.S. Army Engineer Research and Development Center (ERDC) won four awards at the Western Dredging Association (WEDA 29)/Texas A&M University (TAMU 40) conference and seminar, 14-17 June 2009, in Tempe, Arizona. Kenneth Ned Mitchell, Coastal and Hydraulics Laboratory (CHL), was honored as Young Engineer of the Year by the International Association of Dredging Companies (IADC), the Netherlands, for his paper "Depth-Utilization Analysis for Estimating Economic Activity Supported by Dredging." Derek Wilson, CHL, was awarded Best Student Paper by Taylor Engineering, Jacksonville, Florida, for his paper "Visualizing Pipeline Dredge Project Schedules Using 4D Animation of Objects in Google Earth." Dr. Paul Schroeder, Environmental Laboratory (EL) received 1st Best Paper award from the Dredging Contractors of America, Washington, DC, for his paper "USACE Technical Guidelines for Predicting the 3 Rs of Environmental Dredging." Drs. Julie Rosati and Nicholas Kraus were awarded 3rd Best Paper by Great Lakes Dredge and Dock Company, Oak Brook, Illinois, for their paper "Rapid Methods for Estimating Navigation Channel Shoaling."

Kenneth Ned Mitchell, CHL – Young Engineer of the Year Award, "Depth-Utilization Analysis for Estimating Economic Activity Supported by Dredging." In support of the U.S. Army Corps of Engineers (USACE) mission of maintaining the national waterborne transportation infrastructure, USACE invests hundreds of millions of dollars annually towards operation and maintenance, primarily dredging, of federal channels and waterways. Examiners from the Office of Management and Budget have conveyed to USACE the need to provide more detailed economic justification for the money spent each year maintaining the many hundred of channels and sub-reaches to project depths. Indications are that overall funding will not increase significantly until the economic case for dredging activities is improved.

Mitchell's paper presents work being conducted within USACE towards providing this justification through development of a decision tool for aiding in channel maintenance prioritization. By analyzing detailed records already collected by the USACE Waterborne Commerce Statistics Center (WCSC), quantitative information can be compiled on the extent to which commercial shipping utilizes maintained project depths. By cross-referencing commodity codes used by WCSC with those of the U.S. Customs foreign cargo value database, estimates can be made concerning the tonnage and the value of cargo transiting at each 1-ft increment of maintained depth in any given segment of waterway.

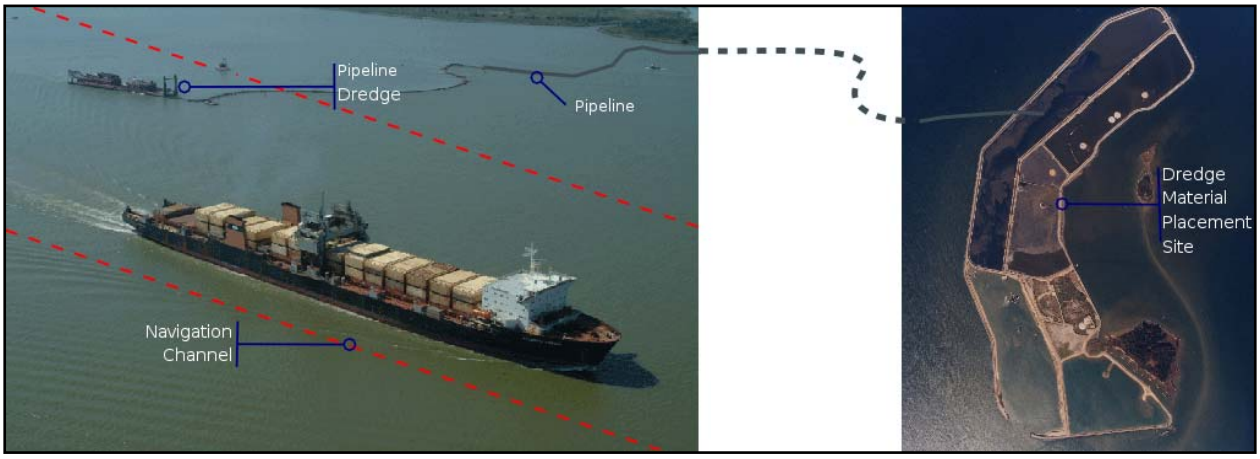


Example channel reach showing tons of import and export for each 1-ft draft increment

This approach differs from the present USACE system for evaluating channels, in which the relative importance of a waterway segment is determined by analyzing the total tonnage transiting at all depths. In the new framework, channels are evaluated by examining the tonnage and cargo value transiting at the marginal depths; that is, those depths vulnerable to shoaling during each budget cycle and, therefore, most dependent upon USACE maintenance dredging. In addition, to improved economic justification of maintenance dredging, this approach offers an objective, consistent framework for prioritizing channels within the USACE navigation portfolio. POC: Ned Mitchell, *Kenneth.N.Mitchell@usace.army.mil*.

Derek Wilson, CHL – Best Student Paper award. "Visualizing Pipeline Dredge Project Schedules Using 4D Animation of Objects in Google Earth." Visualizing the relationships between dredged material placement design and pipeline dredge project scheduling presents a challenging and complex problem in pipeline dredge project management. The Dredging Knowledge Base Expert System (DKBES) Pipeline Scheduling and Visualization Program provides a graphical user interface on a Google Earth platform that can produce a visual time projection of a pipeline dredge project schedule. This graphical user interface produces a 4 dimensional (4D) animation of the dredge project process based on temporal variation of the 3D dredge project features such as the navigation channel and dredged material placement sites.

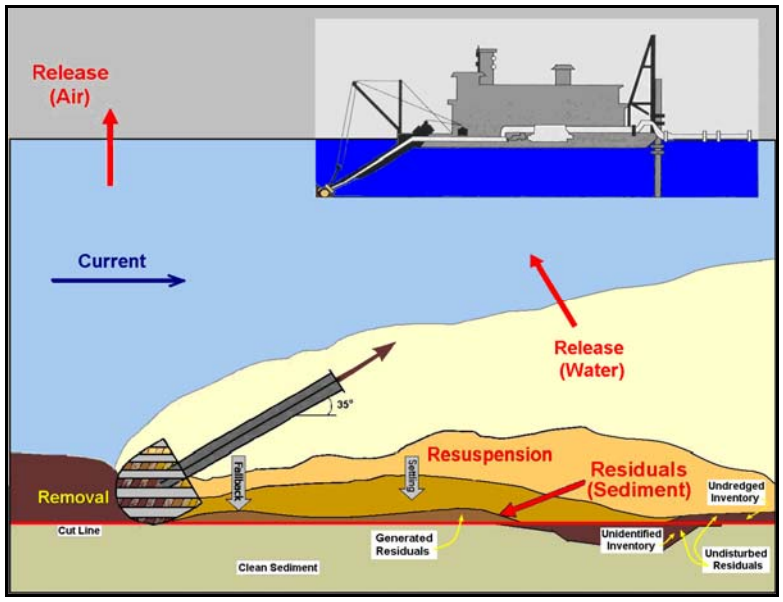
Wilson's paper discusses how the graphical user interface accepts user input of the initial dredge project parameters, executes an existing pipeline dredge scheduling methodology to formulate a range of possible pipeline dredge project scenarios, and translates a given dredge project schedule into a 4D animation of the 3D project parameters. This paper further compares this visualization methodology to previous efforts of 4D modeling within similar engineering disciplines to gain a current perspective of modeling capabilities and limitations. Furthermore, this paper states how this research effort may prove useful to pipeline dredge project managers who must coordinate many project decisions based on a highly dynamic and constantly shifting project environment.



DKBES pipeline dredge project components in operation

Dr. Paul Schroeder, EL – 1st Best Paper award. "USACE Technical Guidelines for Predicting the 3 Rs of Environmental Dredging." A critical component of the evaluation of environmental dredging as a contaminated sediment remediation alternative is the prediction of the 3 Rs: Resuspension, Release, and Residuals. Sediment resuspension by dredging operations promotes contaminant release, and impacts the short-term effectiveness of the remedy as well as the ability to protect the environment and comply with applicable or relevant and appropriate requirements. Sediment resuspension also contributes to the contaminated residuals from dredging. Residuals impact the reduction of toxicity as well as short- and long-term effectiveness.

The USACE Technical Guidelines for Environmental Dredging of Contaminated Sediments provides state-of-the-art prediction methods for the 3 Rs. The guidelines present the key parameters that influence the magnitude of sediment resuspension, and summarize the findings from past dredging projects for a variety of equipment. They provide a method to adjust resuspension estimates for different site and sediment properties. Sediment properties are strongly correlated with resuspension. Contaminant release is driven by the resuspension, plume dispersion, particle flocculation and settling, and the kinetics of contaminant partitioning. These processes are considered in the acquisition of non-equilibrium partitioning data from the dredging elutriate test, and in that data's use in fate and transport models.

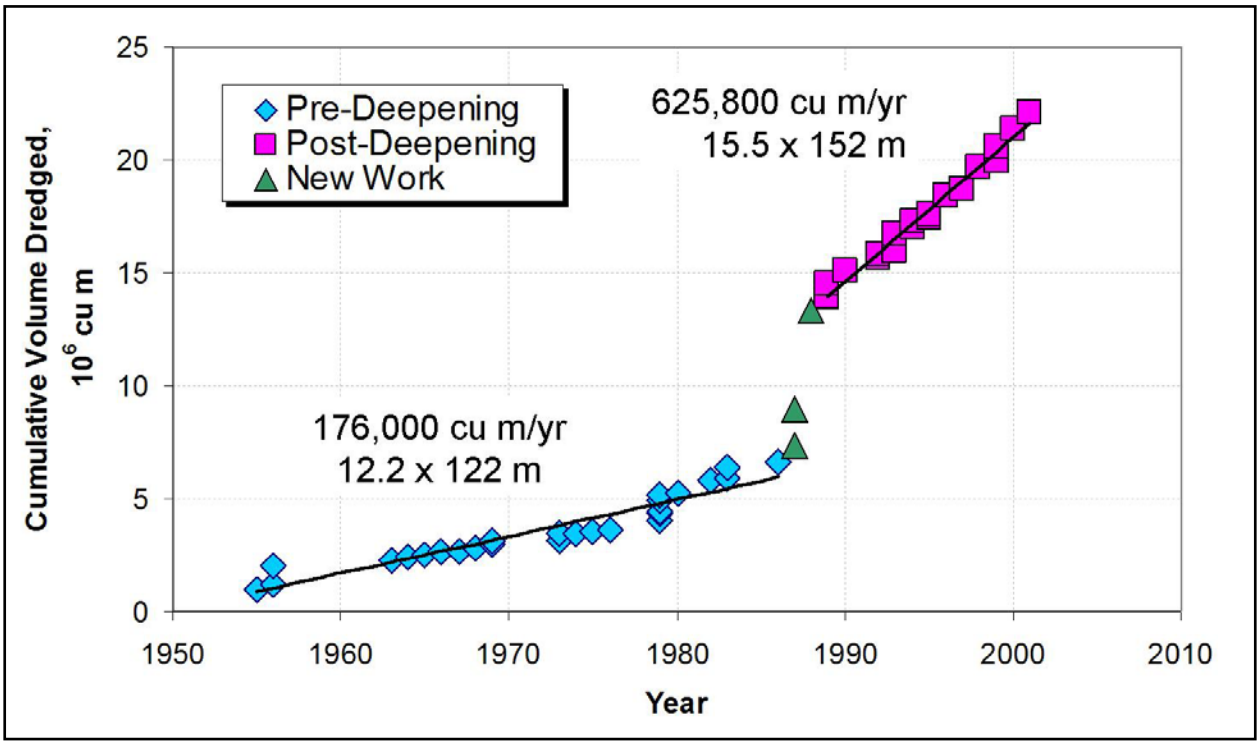


Conceptual illustration of environmental dredging and processes

The guidelines also provide a method to estimate the quantity of generated dredging residuals based on past studies, equipment selection, and site conditions; and a predictive technique to estimate contaminant concentration in the residuals based on the sediment profile (contaminant concentration and density) and work plan. Estimates of the 3 Rs provide the basis for determination of the need for control measures, short-term risk from removal operations, and potential remediation effectiveness/feasibility. POC: Paul Schroeder, *Paul.R.Schroeder@usace.army.mil*.

Drs. Julie Rosati and Nicholas Kraus, CHL – 3rd Best Paper Award. "Rapid Methods for Estimating Navigation Channel Shoaling." The U.S. Army Corps of Engineers' navigation mission is to provide safe, reliable, and efficient waterborne transportation systems (channels, harbors, and waterways) for the movement of commerce, national security needs, and recreation. Federally maintained channels through as many as 600 coastal inlets and through bays, estuaries, and rivers are therefore dredged. Many of these navigation channels have been deepened, widened, and lengthened to accommodate larger vessels and greater transit speed, and to increase maneuverability. These channel expansions have led to increasing and often unanticipated maintenance dredging requirements, partly because the relationship between an increase in channel cross-sectional area and the subsequent shoaling rate is nonlinear. As waterborne commerce and the need for national security continues to grow, vessels are expected to become larger, wider, or both due to economies of scale and increased cargo capacity. It is anticipated that coastal inlet entrance channels will continue to enlarge in the future.

The Rosati-Kraus paper discusses empirical and analytical relationships for predicting channel shoaling based upon historical maintenance dredging data for Corps channels that have been deepened, widened, and lengthened. A new analytical relationship based on an equilibrium channel depth and width is presented to calculate channel infilling and bank encroachment, and tested with the available data. POC: Julie Rosati, *Julie.D.Rosati@usace.army.mil*.



Cumulative dredging volume prior to and after navigational channel deepening and widening, St. Mary's entrance channel, Florida

11th CIRP Annual Tech-Transfer Workshop to be Held at the USACE Seattle District

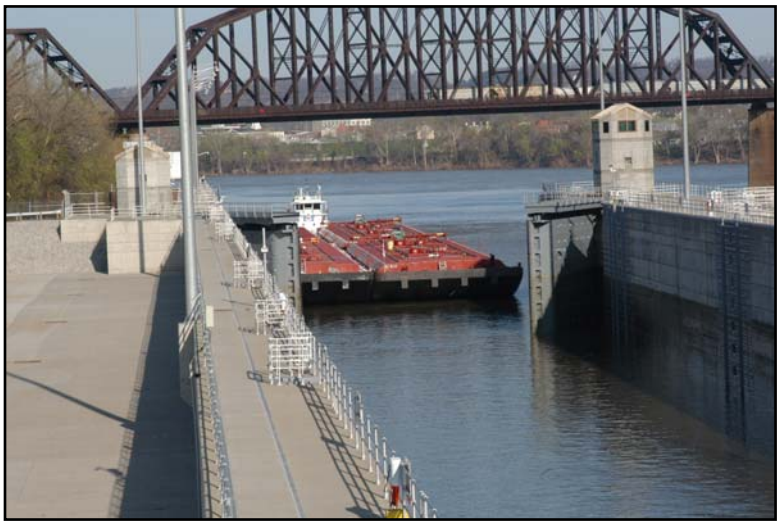
The FY10 major workshop of the Coastal Inlets Research Program (CIRP) will be hosted by the Corps' Seattle District, 1-3 December 2009. The first day will concern navigation channel portfolio management (supporting difficult decisions in a time of limited resources), observed properties of channel infilling, and introductions to Pacific coast projects by those who know them best. The remainder of the workshop will be devoted to features and applications of the Coastal Modeling System for numerically simulating waves, current, sediment transport, and bottom change in and around inlets. The latest version of the workshop agenda can be found at *http://cirp.wes.army.mil/cirp/*. Please put this workshop on your calendar. POC: Nick Kraus, *Nicholas.C.Kraus@usace.army.mil*.

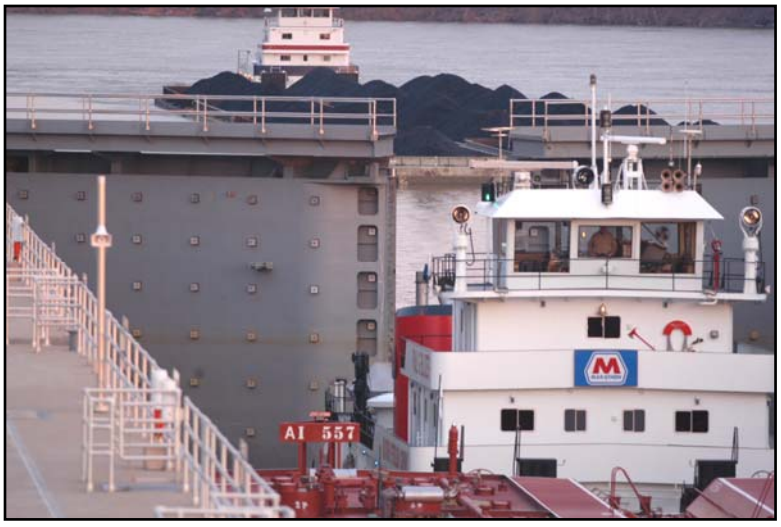
Inland Waterways Users Board Meeting #61 – August 10-11, 2009, Paducah, KY

The 61st meeting of the Inland Waterways Users Board will be held on Tuesday, August 11, 2009, in Paducah, Kentucky, at the Luther F. Carson Four Rivers Center, 100 Kentucky Avenue, Paducah, KY 42003-1500. Registration will begin at 8:30 a.m. The Board meeting will begin at 9:00 a.m., and it is expected to adjourn at approximately 1:00 p.m. On Monday, August 10, 2009, there will be a site visit to the Olmsted Locks and Dam project, currently under construction near Olmsted, Illinois. POC: *Kenneth.E.Lichtman@usace.army.mil*.

New McAlpine Lock

John Neville, LRL
photos by John Neville





More than 10 years ago the Corps began working on a new chamber for the McAlpine Locks and Dam on the Ohio River. On 27 May 2009, Corps commanders and civilian employees, public officials, and industry representatives met for the dedication of the new lock at McAlpine Locks and Dam, located along the banks of the Ohio in Portland, Kentucky, about a mile from downtown Louisville.

"This project is for America," U.S. Army Corps of Engineers Commander Lt. Gen. Robert Van Antwerp said. "We have achieved a great thing for this country's families and businesses. Our engineers, contractors, and their employees work extremely hard to deliver these quality navigation projects."

For a complete story, see *http://www.lrl.usace.army.mil/*.
POC: John Neville, LRL, *John.T.Neville@usace.army.mil*.

PIANC WG49 Nearing Completion on Updated Deep-Draft Channel Guidance

Michael Briggs, CHL

The International Maritime Pilots Association (IMPA) hosted the ninth meeting of PIANC's MARCOM Working Group 49, "Horizontal and Vertical Dimensions of Fairways," on 11-12 May 2009, in London, UK. Sixteen members and guests from 11 countries participated in this meeting onboard the HQS Wellington, the London Headquarters of IMPA. The objective of WG49 is to review, update, and expand design recommendations on horizontal and vertical dimensioning presented in the WG30 report of 1997 entitled, "Approach Channels: A Guide for Design". The working group will be considering recent developments in simulation and design tools and sizes and handling characteristics of new generation vessels.

The report is approximately 90 percent complete. The WG49 plans to complete the final draft by the end of 2009 and have a published report in time to distribute at the PIANC 125th Anniversary Congress in Liverpool in May 2010. Dr. Michael Briggs is the U.S. Principal Representative on WG49 and has led the 8-member team responsible for the vertical dimensioning sections of the report. POC: *Michael.J.Briggs@usace.army.mil*.

EC on Incorporating Sea-Level Change Considerations in Civil Works Programs

EC 1165-2-211, "Incorporating Sea-Level Change Considerations in Civil Works Programs," has been signed. *http://140.194.76.129/publications/eng-circulars/ec1165-2-211/toc.html*.

Army Corps of Engineers Solicits Input on New Ohio River Basin Comprehensive Study

Carol Labashosky, LRL

The U.S. Army Corps of Engineers is conducting a reconnaissance study of the Ohio River Basin, including the Cumberland and Tennessee River basins. Using a collaborative watershed approach, the study will identify current and future water resource issues within the basin. The Corps is seeking input from local, state and federal agencies on their most pressing water resource priorities for the future. The Corps encourages input from environmental non-profit agencies and groups.

"The study enables the Corps along with other organizations to collectively identify the most pressing problems and future water resource needs while collaborating," said S. Michael Worley, project manager, USACE Huntington District, WV.

The study is expected to be completed in December 2009 with a draft report available through the website for public comment at the end of October 2009. The preliminary information gathering phase is underway. The Corps requests interested parties to provide input by September 30, 2009 through the study web site at *http://www.orboutreach.com/*. For information contact project manager S Michael Worley 304-399-5802, Huntington, WV. In Louisville, KY, call Ms. Sharon Bond, 502-315-6857, or Mr. Roger Setters, 502-315-6891.

Annual Corps of Engineers Dredging Underway in Oregon

Jennifer Sowell, NWP

The U.S. Army Corps of Engineers has started its annual maintenance dredging season at 12 Oregon coastal projects and in the Columbia River. Portland District's two hopper dredges and several private industry dredges will divide the work load. A combination of regular budget allocations and stimulus funds made this year's dredging contracts possible.

American Construction will begin dredging about 30,000 cubic yards of sediment from Port Orford, OR, in mid-June. That project is being carried over from last year's South Coast bucket dredge contract. POC: *Jennifer.A.Sowell@usace.army.mil*.

Columbia River Channel Improvement Project Contract Awarded

Jennifer Sowell, NWP

The U.S. Army Corps of Engineers, Portland District, awarded the final contract for the Columbia River Channel Improvement Project to J.E. McAmis, Inc., July 17. The nearly $52 million contract includes $26.6 million of American Recovery and Reinvestment Act funds, along with 2009 appropriated and matching sponsor funds. According to the contractor, the work is estimated to create about 50 new jobs.

Work will begin in mid-August with the removal of 1.7 to 2.5 million cubic yards of material to deepen Columbia River miles 65 to 67, near Longview, WA. There is also a one mile section of basalt between river miles 87 and

88 near St. Helens, OR, that must be blasted and then dredged. The blasting will occur between November 2009 and February 2010, and create between 250,000 and 500,000 cubic yards of material to dredge. The project should be complete by December 2010. While most of the navigation channel has been deepened from 40 to 43 feet, these portions that are composed of more rock than sediment will be dredged to between 49 and 51 feet to allow for future maintenance using typical dredging equipment.

This work will close out the Columbia River Channel Improvement project, a two decade-long effort to deepen the 103-mile navigation channel allowing larger, deeper-draft ships and heavier-loaded vessels access to inland ports throughout the Pacific Northwest. The Columbia River moves $18 billion of commerce annually, and is the single largest wheat and barley export gateway in the nation. POC: *Jennifer.A.Sowell@usace.army.mil*.

Publications of Interest

Chouinard, L., S. Foltz, G. Robichaud, and R. Wittebolle. June 2008. *Condition Assessment Methodology for Spillways*. ERDC/CERL TR-08-10, Champaign, IL. *http://owww.cecer.army.mil/techreports/ERDC-CERL_TR-08-10/ERDC-CERL_TR-08-10.pdf*.

Foltz, S., and D. McKay. January 2008. *Condition Assessment Aspects of an Asset Management Program*. ERDC/CERL SR-08-1, Champaign, IL. *http://www.cecer.army.mil/techreports/ERDC-CERL_SR-08-1/ERDC-CERL_SR-08-1.pdf*.

Uzarski, D., D. McKay, and S. Foltz. January 2009. *Role of Inspection and Condition Assessment in U.S. Army Corps of Engineers Civil Works Infrastructure Management: Current Practices and Opportunities for the Future*. ERDC/CERL TR-09-4, Champaign, IL. *http://www.cecer.army.mil/techreports/ERDC-CERL_TR-09-4/ERDC-CERL_TR-09-4.pdf*.

Conferences, etc.

Email *Dinah.N.McComas@usace.army.mil* if you know of a meeting that would be of interest to our readers.

6–9 September 2009. Smart Rivers. Vienna, Austria.
http://gulliver.trb.org/news/blurb_detail.asp?id=10031

16–18 September 2009. Coasts, Marine Structure and Breakwaters 2009. Edinburgh, Scotland.
http://ice-breakwaters.com

25–28 April 2010. Ports 2010. Jacksonville, FL.
http://www.content.asce.org/conferences/ports2010

10–14 May 2010. 32nd International Navigation Congress, PIANC Congress, 125th Anniversary. Navigation – Ports – Waterway; Liverpool, UK. *http://www.piancmmx.org.uk/*

11–14 September 2010. PIANC 125th Anniversary Celebration, Nagoya, Japan.

20–24 February 2012. 8th PIANC-COPEDEC Conference on Coastal and Port Engineering in Developing Countries, Chennai (formerly known as Madras), India. *http://www.pianc.org/calendarcopedec.asp*