Minutes of the 109th Meeting

31 October - 2 November 2000

Executive Summary

The U. S. Army Corps of Engineers Committee on Tidal Hydraulics (CTH) met in Jacksonville, Florida on 31 October - 2 November 2000 at the invitation of COL Joe. E. Miller, Commander, Jacksonville District Corps of Engineers.

The CTH was asked to specifically address questions relating to sediment deposition on Wards Bank shoreline erosion on Little Talbot Island, and channel migration of the Fort George Inlet channel. Information was presented on the Northeast Florida Regional Sediment Management program with emphasis on the Fort George Inlet area stressing that solutions to presented. Further details of regional coastal processes and Fort George Inlet hydraulics and shoreline erosion were described. A site visit to Wards Bank and Little Talbot Island further educated the Committee members on the scope and effect of the problem. Florida- specific information was completed with a review of the Everglades Restoration Plan.

The Committee was also briefed on the follow up efforts of 3-D numerical model comparisons. Presentations on the Corps Research and Development (R&D) initiatives and further needs, coastal regional sediment management, fine sediment engineering capability, the modeling of pipeline disposal, the monitoring of completed navigation projects and the hydraulic design of tidal wetlands completed the Technical Sessions of the meeting.

In the Executive Session, the committee discussed the Fort George Inlet questions and designated a sub-committee to prepare the written response to the District. Other Committee business was conducted including recommendations for the Corps R&D program.

Minutes of the 109th Meeting

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1. The 109th meeting of the Committee on Tidal Hydraulics (CTH) was held 31 October - 2 November 2000 at the Jacksonville District Corps of Engineers at the invitation of COL Joe E. Miller, Commander, U.S. Army Engineer District, Jacksonville.

2. On 31 October and 1 November, Technical Sessions on the Northeast Florida Regional Sediment Management program and specifically the Wards Bank, Little Talbot Island and Fort George Inlet channel sedimentation and erosion problems were held. An overview of the Everglades Restoration Plan and briefings on the Corps R&D initiatives, coastal sediment management, fine sediment engineering, pipeline discharge modeling, completed project monitoring and tidal wetland designs were also presented. The Executive Session was held on the morning of 2 November 2000. Technical sessions were held in Jacksonville District building, Conference Room 930 and the Executive session was in the conference room on the 23rd floor of the BellSouth Building. A visit to Little Talbot Island and Wards Bank was made on the afternoon of 31 October 2000.

3. Attendees were:

Committee on Tidal Hydraulics

William H. McAnally, Chairman	Coastal and Hydraulics Lab
Virginia R. Pankow, Executive Secretary	Institute for Water Resources
Charles Chesnutt, Liasion	Headquarters, USACE
David B. Wingerd, Liaison	Headquarters, USACE
Lincoln C. Blake	Charleston District
A. Jay Combe	New Orleans District
Eric E. Nelson	Seattle District
Edward A. Reindl, Jr.	Galveston District
Todd L. Walton	Coastal and Hydraulics Lab
Charles L. Werner	New England District

Committee Consultants

Frank A. Herrmann, Jr.	Vicksburg, MS
Ray B. Krone	Professor Emeritus, University of California at Davis
Ashish J. Mehta	Professor, University of Florida

Corps of Engineers Presenters and Guests (1)

John Adams	Jacksonville District
Rolando Altamirano	Jacksonville District
Charlie Berger	Coastal and Hydraulics Lab
Ray Bottin	Coastal and Hydraulics Lab
Brian Brodehl	Jacksonville District
Gary Brown	Coastal and Hydraulics Lab
Robert Dean	University of Florida
Roxane Dow	Florida Dept of Environmental Protection
Mitch Granat	Jacksonville District
Joseph Gurule	Jacksonville District
Daniel Haubner	Jacksonville District
Susanna Hetrick	Florida Dept of Environmental Protection
James Jaspers	Jacksonville District
Mark Latch	Florida Dept of Environmental Protection
David Mathis	Headquarters, USACE
COL James G. May	Jacksonville District
Eric Olsen	Olsen Associates, Inc.
Craig Parenteau	Florida Dept of Environmental Protection
Mark Penton	Mobile District
Cynthia Perez	Mobile District
Russel Reed	Jacksonville District
Donna Richey	Coastal and Hydraulic Lab
Julie Rosati	Coastal and Hydraulics Lab
Douglas Rosen	Jacksonville District
Jerry Scarborough	Jacksonville District
Thomas Smith	Jacksonville District
Charles Stevens	Jacksonville District
Bruce Taylor	Taylor Engineering
Allen Teeter	Coastal and Hydraulics Lab
Dan Vogler	Jacksonville District

(1) Technical Sessions only

4. The minutes are divided into discussions of presentations made at the Technical Sessions and actions taken at the Executive Session. The order of the minutes is not necessarily the chronological order in which these matters were considered at the meeting.

TECHNICAL SESSIONS

5. Dr. William H. McAnally opened the 109th meeting of the Committee on Tidal Hydraulics at 0830, 31 November 2000.

6. Colonel James G. May, Commander, Jacksonville District welcomed the Committee and guests and briefly described the mission and work of the Jacksonville District Corps of Engineers. He stressed the engineering, scientific and environmental facets of projects and the necessity of considering all aspects to achieve a balanced outcome.

7. Dr. McAnally welcomed the participants and guests and briefly summarized the purpose and role of the Committee on Tidal Hydraulics. The Committee is available to offer technical advice on Corps issues relating to tidal hydraulic engineering and science. The members of the Committee and guests introduced themselves and the organizations they represented.

8. Mr. Thomas Smith, SAJ, coordinator and host of the meeting, made administrative announcements, presented several ways of commuting from the hotel to the District Office and reviewed the agenda.

Northeast Florida Regional Sediment Management

9. Mr. Smith presented an overview of the Regional Sediment Management (RSM) Demonstration Program. This national program is a Coastal Engineering Research Board (CERD) initiative with the goal of retaining appropriate material in the littoral zone and developing a balanced natural system. An effective plan, under existing authorities, would save money, generate benefits and involve many (20-30) agencies. In 1998, 250 million cubic yards (mcy) of material were dredged from federal navigation projects. About 26% of the material dredged is placed on beaches or in nearshore disposal sites. However, history shows that over time, more material is being placed on the beach and less in the littoral zone. There are many federal shore protection projects in Florida. The State of Florida has a 15 year, $30 million/year program to develop regional sediment plans for the seven (7) Florida sub-regions.

10. The Northeast Region is one of the Florida sub-regions, and extends from the Florida/Georgia state line to south of the mouth of the St. Johns River. This Northeast Florida Regional Sediment Management (RSM) area includes navigation, shore protection and environmental restoration projects. Fernandina Harbor has been dredged almost on an annual basis, 19 times in the last 20 years, at a cost of $94 million to remove 26.4 mcy over that time period. Jacksonville Harbor has been dredged 13 times in 17 years costing $57.5 million to remove 18.3 mcy. The WRDA 99 authorized deepening 22 miles of channel from 38 to 40 feet which will produce an estimated 8 mcy of dredged material. The Northeast RSM includes shore protection projects in Nassau, Duval and St. Johns counties that are funded a total of $570 million to place 40 mcy of quality material on these beaches.

11. Several sub-regional workshops have been held for the purpose of bringing together representatives of stakeholder agencies to brainstorm actions and identify demonstration projects. Six potential demonstration projects were identified, 3 sand bypassing projects (St. Marys Entrance, St. Johns River and St. Augustine Inlet); a stabilization project (Amelia Island, south end) to stabilize an area of erosion using dredged material; a project to offload disposal sand to the beach; and demonstrations of innovative technologies such as placement of beach quality material into the littoral system.

12. Sediment contamination is not a problem, however, the dredged material might not be beach quality material. The study has the ability to have demonstration projects but it needs sites that will demonstrate success. The site criteria must be identified.

13. Mr. Jerry Scarborough, SAJ, discussed features of and problems with the Jacksonville Harbor Navigation Project. Jacksonville Harbor is the 33rd largest harbor in the nation and the 3rd largest in Florida. The existing 38-foot federal project is inadequate for many vessels. They must light-load or wait for the tide to enter or leave the harbor. This limitation impacts the future capability of the harbor to safely handle larger ships. The feasibility study indicated a great deal of rock material in the channel that is difficult and expensive to dredge. To remain competitive, the port wants a 40-foot channel. Authorization for the deeper channel has been passed, however the District is still waiting for the funds.

14. The proposed project modifications include placing 500,000 cy of material on the beach and using 1.6 mcy of rock to build an artificial reef. Some material will be placed upland and be recycled. Three advance maintenance zones, totaling 14.7 miles of channel, have been authorized to go 3-4 feet deeper than project depth. It is desired to add another 3.5 miles of channel to the advanced maintenance authorization.

15. Other projects were also briefly mentioned. In the Chicopit Bay ecosystem restoration project, the plan is to maintain the training wall and then proceed to restore the island. Mile Point is experiencing extreme sink holes and rapid bank erosion. There are areas 60 feet deep outside the channel that are causing the banks to slump into the deep holes. There is no agreement on the cause but it is suggested that tidal dynamics play a critical role. Extensive model studies may identify the cause and one suggested correction is a series of groin fields to counteract the dynamic forces. Mill Cove has some diversion features that have helped circulation but not enough to correct the problem. The WRDA 96 had authorized work which is 100% funded by the local sponsor.

16. Discussion - There are no mitigation requirements due to environmental issues in the Jacksonville Harbor project. There is no channel widening, only deepening. In some areas it may be possible to narrow the channel which would save costs especially in the rock dredging areas. Ship simulation studies could determine optimum channel dimensions. For upland disposal areas, the dikes have been raised to increase capacity. It was suggested that a depth of 40 feet

might be the limit for Jacksonville because of the rock bottom and the costs associated with its removal.

17. Mr. Charles Stevens, SAJ, presented an overview of the Duval County Federal Shore Protection Project. The project was authorized in the 1965 Rivers and Harbors Act to construct and maintain, with periodic renourishment, 10 miles of shoreline from the Mayport jetties to the St. Johns County line. Completed in 1980, the renourishment amounts are determined by project needs and maintenance dredging amounts. Renourishment of about 1 mcy occurs about every 4 years. If the opportunity arises that maintenance dredging is occurring near the shore protection area, the material is used to satisfy the renourishment requirements. Otherwise the material is taken from offshore borrow areas. The formation of dunes greatly helps reduce the need for more frequent beach renourishment. Damage from Hurricane Floyd in September 1999 was repaired by rebuilding the damaged dunes and berm with material from Buck Island located in the St. Johns River. Approximately 527,000 cy of material were trucked to repair the berm and sections of reaches 2, 3 and 4. The shore protection project appears to be performing to the project design. There has been no property damage since 1980 when the project was completed.

18. Discussion - Material loss for this area probably is a benefit to neighboring beach areas. When using offshore borrow consider including in the plans and specifications the identification of borrow areas closer than the current 7 mile site.

19. Mr. Daniel Haubner, SAJ, reviewed the Little Talbot Island Federal Shore Protection Project. Highway A1A/SR105 is an evacuation route which is endangered by the erosional pressures along the shore of Little Talbot Island. The department of Transportation (DOT) has unsuccessfully tried dumping rubble to protect the shoreline. An engineering solution is needed to address the wave and current climate and their contribution to the problem. The project is authorized but as yet unfunded.

20. Discussion - Little Talbot Island is state owned. The existing approach appears to be fighting nature, which will ultimately win. A proposal to relocate the road addressed cost and environmental issues but was not acceptable to the Florida Park Service.

21. Mr. Thomas Smith briefed the attendees on some details of the Northeast Florida Regional Sediment Management (RSM) Demonstration Project. He began by showing aerial views of the Ft. George Inlet/St. Johns River entrance area, identifying the features and providing a general orientation to the area of interest. Recommendations generated by the Northeast RSM workshop included: backpass sand to Little Talbot Island Shore Protection Project; bypass sand to Duval County Shore Protection project, and a small (250,000 cy) demonstration of pinpoint excavation techniques, and use Wards bank as a source for beach nourishment/shore protection. These demonstration projects have economic, environmental, and programmatic benefits and would at the same time reduce channel shoaling.

22. Mr. Smith continued with information on the North Jetty which was constructed in 1892 and has had several major rehabs and repairs since. There are several environmental concerns that must be considered and addressed. The area north of the No. Jetty is habitat for the piping plover and has been designated as critical habitat. This area is also in the Coastal Barrier Resource System (CBRS) in which Federal funds can not be spent. Wards Bank is part of this area and accretes by about ninety-six thousand CY per year. Water quality issues especially in the Timucan National Ecological and Historic Preserve must also be addressed.

23. Discussion - The jetty at +8 feet has some wave overtopping during storms. This happens at least every year. It was also mentioned that northeast Florida contains sand rich counties which on the average are slow on the shore transport of sand.

24. Dr. Bruce Taylor, Taylor Engineering, presented an overview of the Diagnostic Modeling System (DMS). The DMS is an inexpensive tool used to rapidly identify shoaling areas and focus on potential solutions. The components of DMS are: a) a data manager using GIS software to organize, store and display historic data; b)a manual containing an encyclopedia of shoal types with explanations of the shoaling mechanism and case studies; and c) an analytical toolbox containing modeling tools and simple desktop analysis procedures. The toolbox contains a ebb/flood jet calculator, point sediment transport calculator, and a program for cross channel flow calculations. The standardized output displays enables comparison of multiple solutions. Vector plots and difference plots can be generated which will show the impact of modifications. The DMS has been used in a proof of concept exercise on Matagorda Ship Channel, TX and East Pass, FL. The tools are being applied to Barnegat Inlet, NJ and Bay Center, WA.

25. Discussion - The districts will use existing data in the system. After the data are entered the system will perform a search for similar cases and their solutions.

26. Dr. Taylor continued with information on the Fort George Inlet hydrodynamics work preformed for the Florida DOT. Fort George Inlet, located between St. Johns River and Nassau Sound, is an aggressive waterway with strong currents and critical erosion. It is interconnected through interior waterways and demonstrates tidal pumping (flood > ebb). A RMA2, 2D depth averaged model mesh, incorporating wetting and drying, actual bathymetry, and elevation and flow boundary conditions was used to simulate 100-year and 500-year storm surges. The model results of current conditions highlighted the erosional pressures on Little Talbot Island and SR105. A scenario in which the channel was relocated south through Wards Bank resulted in much improved flow distribution removing the pressure from the Little Talbot shoreline and the SR105 bridge abutments. Dr. Taylor felt strongly that the use of two-dimensional modeling can evaluate long-term bed elevation changes, identify erosion hot spots, and enable the evaluation of engineering alternatives.

27. Discussion - If regional sediment management concepts are to be applied, there is the need to have regional tidal information. If there is a hydrodynamic

change at one location, how will it influence other inlets? Other inlets and entrances were incorporated into the model.

28. Mr. Eric Olsen, Olsen Associates, Inc., discussed the Fort George Inlet Shoreline Study sponsored by the Division of Recreation and Parks, FDEP. A photographic history of shoreline change was presented illustrating accretion and land lost areas. It was noted that prior to construction of the No. Jetty, there was a single entrance to the St. Johns and Ft. George Rivers. Since tightening the No. Jetty in 1933, the Ft. George Inlet has continuously migrated to the north. In the near term there are severe erosional threats to the Little Talbot Island shoreline and park infrastructure. The solution will involve the cooperation of state, federal, and local governments which appear to have conflicting interests and solutions for this localized problem. The current plan of protection is inadequate. Any solution or non-action will have impacts on other parts of the region. Erosion rates are too great for beach fill alone to be successful. Stabilizing the entrance with one or two terminal structures may help. However, the alternative with the most merit at this time, is to relocate the inlet channel. If the channel is relocated to cut through Wards Bank and the existing channel filled in, the inlet may return to it shape of 20-40 years ago. This non-structural solution may be self maintaining for some time. However, the forces are such that it will eventually migrate back to its present position. There is still the fact that both Little Talbot Island and Wards Bank are classified as Coastal Barrier Resource Units that impede federal intervention.

29. Discussion - The state is not bound by the 50 year cycle for the economic life of a project. The volume of more than 1 mcy from cutting a new inlet channel through Wards Bank will be enough to fill the areas experiencing bankline erosion. This approach might supply some piping plover protection because the relocated land will be part of the state park. Thought needs to be given to the depth of the relocated channel. There are so many parties involved that an above water solution might be difficult. Consider dredging from the north and by passing to the south as a partial solution to substantial acreage loss.

30. Mr. Daniel Haubner, SAJ, gave a preview of the 5 sites that would be visited on SR105/A1A, Little Talbot Island and Wards Bank. The afternoon was spent visiting Little Talbot Island and Wards Bank and observing the conditions discussed in the morning presentations. During the course of the site visit, State and Federal Park Service representatives, providing background information, expressed concern that inlet closure would result in substantial water quality problems inland of the inlet.

31. Mr. Mark Penton, SAJ, concluded the Regional Sediment Management presentations with a discussion of data storage and display using a Geographic Information System (GIS). With all information georeferenced and using a common coordinate system (UTM zone 16) conditions and differences can be quickly and easily displayed. The GIS can also store photographs and surveys. He demonstrated a sample of differences between two depth surveys and the ability of the GIS to do an on the fly profile. ArcView 3.2 is a desktop product being used. A cell is normally 50 feet square but if the survey points are close enough the cells can be made smaller. The GIS also contains a data dictionary,

meta data, and a catalogue of datasets. This system is compatible with DMSMART and the developers will work on compatibility with other models as appropriate.

32. The discussion generated many questions about regional sediment management, with questions having different answers depending on the perspective of the person/organization asking/answering the question. Can excess sand be managed to benefit other areas? Can the flow of water and existing sand be successfully managed? What is success?

33. Dr. Mehta gave a brief history from the 1800's where Fort George Island faced the ocean and there was only one ocean inlet.

34. Dr. William McAnally and Mr. Thomas Smith lead a discussion on the previous day's site visit and a review of the questions posed to the CTH.

Question 1. No Action

a. Will the location of Fort George Inlet stabilize under the no action plan?

b. If not, what will be the likely migration scenario of the inlet?

No clarification needed for this question.

Question 2. Close Fort George Inlet

a. If the inlet was to be closed, would it remain closed into the near future?

Near future was identified to be 10-12 years and the method of closing was mechanically closed with sand and no other action to open another inlet.

b. What would be the hydraulic impacts associated with inlet closure?

A question was asked if there would be enough fresh water head to break through or are the existing outlets sufficient to handle the flow from excessive rainfall? The response was that there is no real upland drainage. It was also unknown if water quality data were available.

c. What water quality effects should be anticipated in the Timucuan Preserve if the inlet is closed or closes naturally?

No questions or clarification needed on this item.

Question 3. Relocate Fort George Inlet Channel

a. Would the proposed inlet relocation result in a stable channel alignment?

This addresses the Olsen design - a cut through Wards Bank and with no stabilization.

b. What would be the hydraulic impacts associated with inlet relocation?

No questions or clarification needed on this item.

Question 4. Stabilize Fort George Inlet

a. What jetty configurations should be considered to stabilize Fort George Inlet?

This refers to a single inlet with 2 jetties.

b. How would the interior channels respond to inlet stabilization?

No questions or clarification needed on this item.

Question 5. Terminal groin north of Fort George Inlet

a. What terminal groin configuration would result in stabilization of the Fort George Inlet Channel system?

This refers to a single jetty on the north side.

b. How would the interior channels respond to construction of a terminal groin to the north of Fort George Inlet?

No questions or clarification needed on this item.

Question 6. Bypass/backpass sand from Wards Bank

This refers to the excavation of material from the north tip of Wards Bank and with no structures.

a. Could the Fort George Inlet channel be stabilized through selective transfer of material from the northern end of Wards Bank?

b. Would backpassing of this material onto the southern end of Little Talbot Island be affective?

c. Could the growth of Wards Bank be effectively managed through bypassing to Little Talbot Island and bypassing to the Duval County shore protection project area?

d. How far south of the Saint Johns River entrance should the material be bypassed to in order that it return to the natural transport regime?

Question 7.Bypass/backpass sand from fort George Inlet flood shoal fans

a. Where and to what depths could the flood shoal fans at Fort George Inlet be used as a borrow area for shore protection?

Ebb shoal was changed to flood shoal.

b. Would this or any of the other alternatives considered impact the stability of the fort George Inlet bridge?

No questions or clarification needed on this item.

Question 8. Construct north jetty weir and settling basin at Saint Johns River entrance

The jetties are two miles long.

a. Is the material moving through the north jetty a potential shoaling source for the navigation project?

b. Could a north jetty weir and settling basin system be designed to restore the natural flow of sand from across Fort George Inlet and onto the Duval County beaches to the south of the Saint Johns River entrance?

Central and Southern Florida Project

35. Mr. Russel Reed, SAJ, presented an overview of the Everglades Restoration Plan. This comprehensive plan is to restore the south Florida ecosystem, which

includes the Everglades. The Plan also provides for other water-related needs of the region including urban and agricultural water supply and flood protection. He showed how the water flow in the Everglades has changed from the natural system (circa 1850) to the managed system of 1995. The plan is to match the historic flows to return as close as possible to the natural system. This includes managing water flow to mimic the historic wet and dry annual seasons.

36. Three major models are being used to simulate the hydrology of the region.

a. South Florida Water Management Model (SFWMM) simulates the hydrology and water management of the region and has run a continuous daily simulation over a 31 year record.

b. Natural System Model (NSM) simulates the hydrology of the pre-drained Everglades and is based on SFWMM.

c. Across Topic Level System Simulation (ATLSS) provides information on the biological responses of several species and species groups and is used to evaluate the effects on key species.

37. There are 68 components of the plan, they include surface water storage reservoirs, aquifer storage and recovery, stormwater treatment areas, wastewater reuse, seepage management, and operational changes of these components that meet the goals of the restoration plan. The Plan will improve: the functioning of the south Florida ecosystem; Lake Okeechobee water levels; urban and agriculture water supply; water deliveries to Florida Bay, Biscayne Bay and other estuaries; and regional water quality conditions while maintaining the existing level of flood protection.

Committee Projects

38. Dr. Charlie Berger, CHL presented follow up information from the last CTH meeting (108th) on a comparison of 3-D numerical models. He stressed that the focus should be on the physics of the problem and not to get caught up in the numerics. The choice and use of a particular model (regression, genetic, neural network, physics model) is limited to the user's training. The information presented focused on aspects of physics models that include the equation set, the computer code, and the discrete model. He presented a Modeling Checklist, a series of questions that the user should answer as the modeling process advances.

Equation set - explains the physics of the system.
- Do the equations apply?
- Can they solve the problem?

Computer code - works the equations and includes all terms.
- Is the mixing description correct?
- What turbulence model is used?
- Are all terms included?
- Are there comparisons to flume and analytic results?

Discrete Model - represents the local area and includes the boundaries and channel bathymetry.
- Set up - Are the boundaries appropriate?
- Does the grid represent the equations?
- Verification - Does the model represent the equations?

Validation - Does the model represent the estuary?
Are the parameters based upon physical characteristics?
Are the parameters reasonable?
Sensitivity - Are the results highly sensitive to any of the parameters?
Testing - Is the testing setup to reduce uncertainty? (Plan vs Base)

39. Discussion - It was suggested that the CTH evaluate and recommend appropriate uses for different models. There may not be one model for all applications. The selection of a certain model will depend on the study requirements and the physics of the problem. Accuracy is important and the underlying assumption is that the model verification is good. An ASCE committee has been working for 12 years on trying to set guidelines for model selection and use. It is not an easy task. Environmental agencies want to see if post-construction results can be compared to the model predictions. There is a problem with this because frequently what's constructed is not the same as what is projected and modeled. It is difficult to do post-construction validation. It was noted that the Corps does not analyze project performance properly.

40. Mr. David Wingerd, CECW-EW gave a brief summary of the Corps Headquarters move to the GAO and Kingman Buildings. The move involves the merging of some groups and is being taken as an opportunity to retire for many who qualify.

41. Mr. David Mathis, CERE-ZB spoke of the changes taking place in the Corps Research and Development (R&D) community. The direction is to focus on the long-term, use the listening sessions effectively, refocus on the Corps business functions, and get the MSC's more formally involved in the process. The R&D Committee may be restructured and the 23-25 individual research programs will be revisited, reevaluated and restructured. An effort to establish a Technical Assistance Network (a DOTS type program) to the labs and districts will be made. It is envisioned there will be technical assistance for Corps projects in the areas of navigation, environment, regulatory, recreation, flood control, and infrastructure.

Tidal Hydraulics Reach and Development

42. Dr. William McAnally discussed the Corps' R&D initiatives. The Corps has reorganized and renamed the research laboratories into an organization called the Engineering Research and Development Center (ERDC). The seven laboratories in ERDC are: Coastal and Hydraulics Laboratory, Information Technology Laboratory, Environmental Laboratory and Geotechnical and Structures Laboratory located in Vicksburg, MS; the Cold Regions Research and Engineering Laboratory in Hanover, NH; the Construction Engineering Research Laboratory in Champaign, IL; and the Topographic Engineering Center at Fort Belvoir, VA. Presently five of the laboratories will be getting new Technical Directors. He also outlined the structure of the Coastal and Hydraulics Laboratory (CHL) which is reducing the number of branches from 12 to 10.

43. Recognizing that the existing process has some weakness, the new direction

of the R&D program will place a greater emphasis on strategic issues. Currently about 20% of the program is strategic and the goal is to have a 50/50 split between strategic and tactical issues. The Divisions should be more involved by having a Technology Officer in each Division to determine strategic direction and expand the technical support in the Corps business areas. Part of the process will be the identification of Future Operating Capabilities (FOC) - technologies that need to be developed to accomplish specific mission goals. Water resources projects need to look at the basin-wide system and consider the interrelation of water, sediment, and the biota. Regional sediment management is a concern in more than one business function. It is important in navigation, flood/storm damage reduction, emergency operation, and environmental restoration. Capabilities developed for one area will benefit another.

44. Dr. McAnally also promoted the use of the ERDC library web page. Located at http://libweb.wes.army.mil the service provides a search engine for all ERDC publications in the digital media archive.

45. Ms Julie Rosati, CHL discussed sediment management in the coastal environment. Coastal Regional Sediment Management (RSM) is the management of sediment and coastal structures at any particular location with an understanding of the regional system which is defined by the sediment process and the time frame of consideration. These actions maximize benefits economically and environmentally over the long term, broaden the region of traditional coastal planning, and involve multiple stakeholders. The regional approach saves money in the long term by addressing problems that benefit several business function areas. She outlined the goals and schedule of a five year national regional sediment management demonstration program that involves 11 districts located on the four U.S. coasts.

46. Some of the tools available in the RSM program are: the Sediment Budget Analysis System (SBAS); the regional shoreline change model (Cascade concept) which explores the effects of shoreline projects on the nearshore, innershore, and outer shelf areas; and the inlet morphology dynamics model. Plans to upgrade the STWAVE model to a regional design are underway and research is ongoing on Artificial Neural Network (ANN) Technology which will be able to perform real-time forecasting of waves and currents. It is hoped that a proposal to examine coastal geologic influences will be developed and funded. More information can be found on the RSM homepage at http://216.83.232.123/

47. Mr. Allen Teeter, CHL developed further the concept presented by Dr. McAnally of the Future Operating Capabilities (FOC) by introducing the idea of a Capability Package (CP) on Fine Sediment. A Capability Package reflects the strategy and needs of the FOC. A fine sediment capability package would address the costs and adverse effects on navigation and other projects from sediment deposition. Fine sediments have distinct characteristics that make it reasonable to study as a separate group. He identified six FOCs and several current R&D work units that the fine sediment capability would apply, outlined the process to create the capability package, and highlighted CHL's capabilities to succeed in this activity.

48. Mr. Teeter continued the technical presentations with information on

pipeline disposal modeling. Modeling dispersion from pipeline disposal provides methods to predict the sediment plume and underflow spreading. Using deep and shallow field measurements of plume and underflow sediment concentrations from a dredging event in Laguna Madre, TX, an underflow model (PUF1) was developed. PUF1s (single grain size) calculates sediment discharge, total discharge, and breadth, height/thickness of the underflow. PUF1m (multi grain size) model has been coded but not yet tested. It will be linked to SSFATE so that water column suspended sediment can be calculated. The preliminary single size model runs show reasonable results and agreement with the field measurements of thickness and extent. However, the district information is not all in so further work must be done before finalization.

49. Discussion - It was suggested that perhaps we can influence the NSF to do some basic research to assist with the fine grain sediment efforts. The model CDCORPSMIX was mentioned as being too conservative. It does not represent mid-field effects only about the first 20 feet of the near field.

50. Mr. Ray Bottin, CHL, Program Manager of the Monitoring Completed Navigation Projects (MCNP) Program explained that the criteria for being considered in the MCNP program is that the project be completed, O&M funded, and navigation or mitigation in nature. It can be located in a coastal zone, estuary, river, lake, or reservoir. The program aims to extract lessons learned from completed projects and apply those lessons to other O&M projects. The selected projects are monitored over a 2-3 year period to determine if it is functioning as designed and constructed. The process from initial nomination to final selection was described and a map locating the completed and current monitoring sites was shown. He stated that the program may have solved local O&M problems and now needs to look at the regional sediment effects. Performance is examined for the constructed feature and not necessarily at the bigger picture of the entire project or region. Each site has a custom monitoring program and uses information such as current meter data, wave data - telemetry and physical collection, and GEOS supplied real time data. The Siuslaw jetty spurs was sited as an example of a technique that successfully deflected sediment away from the entrance channels and enabled the construction of shorter jetties. This technique might apply to other locations and is another option in jetty design. A discussion of technology transfer options included the initiation of a web based process using “push” or “pull” techniques. There was no preferred method championed.

51. Messrs. Gary Brown and Joe Letter, CHL discussed their work on the Hydraulic Design of Tidal Wetlands. The object is to develop guidelines and design tools (adequate analysis at least cost) for the establishment of tidal wetlands. The work addresses design criteria for control structures; improved numerical models to simulate tidal wetland hydraulics; and an analysis of wetland response to seasonal and long term tidal changes. The design criteria will emphasize simplicity and self-maintenance and include the sizing of inlet channels to achieve the optimum inundation-frequency for the desired wetland vegetation and species, and the design criteria for hydraulic structures. Model improvements will include the incorporation of vegetative roughness for specific vegetative parameters or the choice of a reference standard. Additionally,

hydraulic structures typically used in tidal wetlands, such as tide gates and culverts, will be incorporated into the models. In the interim, an alternative method of using a neural network analysis of long term tidal data to predict water surface elevations over an extended period of time will be conducted.

52. Discussion - A 1D vertical model can be used for assessing marsh creation plans and evaluate the "what if" scenarios. This is on target of how to design environmental restoration projects. The communications between the flood control and the wetlands programs need to be improved. Many benefits can be obtained for both programs if the biologists and engineers start talking to each other. The wetlands design and analytical tools are steps to improve communication between biologists and hydraulic engineers using computer tools to bridge the communication blocks. RMA2 is a well supported, capable tool. It is used by AE firms and the technology is widely applied. Models need to be made compatible with each other and perhaps the routines can be incorporated into HEC or some other model.

53. Dr. Krone stated that any successful marsh restoration program must start with the soil and water hydraulic aspects. Find out what plants the biologists want. A tidal marsh has a progression of success, design for it and the accretion of sediment. Any one limiting factor can limit the entire system. There is a paradigm change here, don't engineer sediment out of the system but manage it to go where we want it. It was suggested that a presentation like this be made to the water quality committee.

54. An open discussion and recommendations for R&D was lead by Dr. McAnally. There was much interest in providing users some guidance on the selection of models. Charlie Berger provided a memorandum on the Description of 3D Numerical Estuarine Models. This was requested by the Committee at the 108th meeting of the CTH in Vicksburg, MS (see Minutes of the 108th Meeting, 21-23 September 1999, paragraph 37). The memorandum is intended to provide a non-modeler with enough information about 3D estuarine models to ask reasonable questions of the modelers and be better able to assure quality results. The memorandum contained a table comparing the capabilities of different models against standard features of model type (implicit/explicit), grid type, stabilization, linearization, vertical transformation and equation set. The discussion resulted in the following suggestions and observations:

a) Use and expand Berger's table - it was well liked by the Committee as an easy and quick way to compare model capabilities.

b) Develop technical notes on the models and include a point of contact for further information.

c) Add to the table information about specific situations where the model works best.

d) Develop a reference list.

e) A suite of standard conditions should be developed and used to test all models to identify their capabilities and limitations.

f) A catalogue, of frequently used and accepted models, addressing model capabilities should be developed and include models of other federal agencies, states and private industry.

g) It was cautioned that even a model considered appropriate for an

application may not always succeed.

h) Model studies must be sponsor directed, if not they will go elsewhere.

i) With the merger of CERC and HL into CHL efforts should be made to see if the models developed in the separate labs are compatible with each other.

j) Within CHL there are mixed signals about the models - this should be resolved.

k) Better communication is needed between the Divisions and HQ - HQ does not have the time to look closely at this issue.

l) The Division Commanders are on the Board of Directors and the Corps needs Corporate direction and leadership in this area.

55. Other items discussed included:

a) Fine grain sediment model - The Atchafalaya River at Morgan City is authorized to 20 feet and has 5 feet of fluff. They want to deepen it 5 more feet. A model study is needed to demonstrate the effect of the deepening. The feeling was it will not make a difference.

b) Virtual Workshop - deep draft O&M needs a web site to post and reply to items. The Coastal Inlet Research Program web site is planning to launch such a forum in November.

c) Workshop on Innovative Navigation Projects - Dr. McAnally announced the workshop which will be in Vicksburg, MS on 5-7 December 2000. He encouraged everyone's attendance.

d) Field Review Groups - Some do a good job of communicating. Perhaps the virtual workshop idea would work well.