Coastal Storm Modeling System Workshop
(ERDC-CSTORM-MS)

November 15-18, 2010
Coastal & Hydraulic Laboratory, Vicksburg, MS
CHL Main Conference Room (Room 200)
Workshop Agenda

Note: Normal font indicates power point presentation or demonstration by trainer
Italic font indicates a "hands on" activity for the participants

Day 1: Activities include 1-hr Executive Briefing and 3-hrs Intro followed by 4-hrs detailed overview of ERDC's Coastal Storm Modeling System (ERDC-CSTORM-MS).

0800 – 0830 Welcome and Introduction
- Introduce training team
- Objectives of "the System"
    - Determine if shore protection structures are sufficient
    - Determine how structures impact local conditions
    - Define FEMA flood plains
    - Project lifetime projection
- Logistics etc for the workshop
- Overview of workshop schedule

0830 – 0930 Executive Briefing
- Background
- Target Applications
- System Modules
- SMS Interface Introduction
- HPC Implementation
- Target Platforms
    - HPC
    - PC
- User Community
    - Districts, State and Federal agencies
    - Academia and Industry
- Modes of Application
    - Standalone
    - Develops BC's for other ERDC models

0930 – 1015 System Implementation in SMS
- Models
- Interfaces
- HPC connectivity - scripting

1015 – 1030 Break

1030 – 1200 Intro to System with a sample application
- Description of System components
    - Wind models
    - Wave models
    - Circulation models
- Databases
    - HURDAT
    - Storm Tracks
    - NCEP, IKU, FNOC,
-Example application for Hurricane Katrina
    - System Master Control Window
    - Access to data sources
    - Build grids/meshes
    - Prepare and visualize model grids and inputs (spatial)
    - Prepare time-sink of coupled models (temporal visualization)
    - Create BC's for coupled models
    - Q/C entire inputs for an application
    - Launch simulations
    - Visualize and describe results
    - Create BC's for ADH, BOUSS and other models

1200 – 1300 Lunch

1300 – 1700 Detailed Project Overview (demo and theory)
- Wind models (PBL, Holland, etc)
- Generate grid
- Prepare model input parameters
- Deepwater circulation model (ADCIRC)
- Generate grid
- Prepare model input parameters
- Deepwater wave model (WAM)
- Generate grid
- Prepare model input parameters
- Wave transformation model (STWAVE)
- Generate grid
- Prepare model input parameters
- Project Master Control
    - Summary data
    - Q/C of inputs
    - Multi-grids visualization
    - Project time visualization
    - Launch individual models simulations
    - View and analyze results
    - Engineering outputs

Day 2

0800 – 0900 Project Briefing
- Objective
- Domain and purpose
- Data sources

0900 – 1000 Storm Science
- Different methods of wind forcing (i.e. models, measurements)
- HURDAT Database
- Synthetic Wind Model

1000 – 1030 SMS Demonstration
- Defining a storm track
    - HURDAT Database
    - Synthetic Wind Model
- Perturbations
    - File management

1030 – 1130 *Storm Track Definition – Starting a Project*
- *Using the HURDAT database*
    - *Importing*
    - *Missing data required for the wind model*
- *Storm Perturbation options*
    - *Create a suite of 12 storms*
        - *2 tracks (left)/2 velocities (slow)/3 central pressures*
- *Using the Synthetic Wind Model*

1130 – 1200 Spatial extents and project summary/timeline

1200 – 1300 Lunch

1300 – 1430 *Spatial linking of system components*
- *ADCIRC grid (import with comments on generation)*
- *PBL grid frame definition (based on storm track)*
- *WAM grid frame (copy PBL) & grid generation (comment on resolution)*
    - *Setup simulation*
- *STWAVE grid frames & grid generation*
- *Project layout*
    - *Summary window/Timeline - time setup*
    - *Grid visualization window*

1430 – 1530 Overview of Atmospheric Forcing
- Wind models description
- ADCIRC internal wind models
- Grids for wind models
- Inputs for wind models
- Run wind models
- Wind model application (for WAM/ADCIRC)

1530 – 1700 *PBL, Holland, Vortex Models*
- *Set up PBL model parameters*
- *Run model*
- *Review files (input/output)*
- *Visualizing model results*

Day 3

0800 – 0900 Overview of WAM Offshore Wave Model
- Theory
- Applications
- How results can be used as BCs for nearshore wave model

0900 – 1100 *WAM Model Setup, Execution and Visualization*
- *Single coarse grid simulation for -general input parameters*
  - *Minimum frequency and number of frequencies*
  - *Number of directions*
  - *Time steps*
  - *Output frequency*
- *Setting up save stations for STWAVE boundary conditions*
- *Wind forcing, for PBL winds, application of project time visualization*
- *Running WAM*
- *Visualizing WAM results*

1100 – 1200 Nesting WAM Grids

1200 – 1300 Lunch

1300 – 1445 Overview of ADCIRC, STWAVE models and the COUPLER
- Theory
- Applications

1445 – 1500 Break

1500 – 1700 *ADCIRC/STWAVE/COUPLER*
- *Setting up a coupled simulation*
- *Using WAM results for STWAVE boundary conditions*
- *Using PBL wind forcing*
- *Utilization of project time visualization window*
- *Executing simulation on PC*
- *Input data sets for ADCIRC*
  - *Tau0/Wind Reduction Factors/Bottom Roughness*
  - *Eddy viscosity/Sea surface above GEOID/Surface canopy coeff.*
  - *Surface submergence state*
- *Input data sets for STWAVE*
  - *Spatial roughness/Levees (structures)*
- *Visualizing results*

Day 4

0800 – 1030 *Conclude ADCIRC/STWAVE/COUPLER*

1030 – 1045 Break

1045 – 1130 HPC System Tutorial
- Layout of HPC file systems
- Basic UNIX commands
- How to submit a job to the queue
- How to move between local systems and HPC

1130 – 1200 Scripting the HPC from SMS
- Generating scripts in SMS
- Running the PC generated script

1200 – 1300 Lunch

1300 – 1400 Coupling the system with ADH and BOUSS

1400 – 1500 Future Development, wrap up and summary