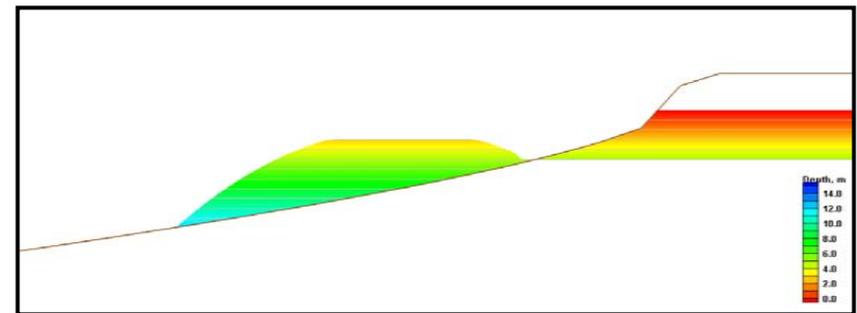
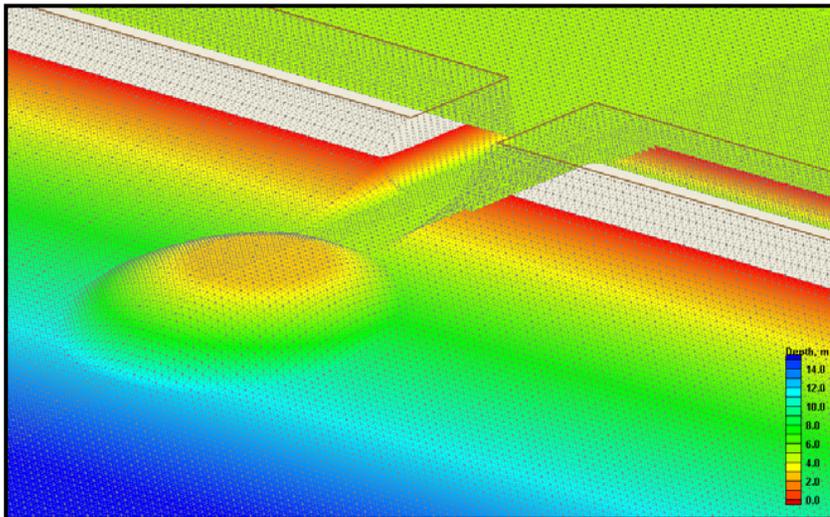


*Coastal Inlets  
Research Program*



# Overview of the Coastal Inlets Research Program and **CIRP SMS** Modeling System Development



*Nicholas C. Kraus  
CIRP Program Manager*



# 1. CIRP Overview



## CIRP Objectives

1. Conduct R&D to reduce O&M costs at inlet navigation projects
2. Treat inlet channels & adjacent beaches as a system
3. Transfer technology

Knowledge, Engineering guidance,  
Workshops, Engineering models,  
Web site, Databases,  
Advanced models, PC software



# CIRP

## Coastal Inlets, the Corps, Navigation



**THE UNITED STATES CONSTITUTION** (ratified by June 21, 1788)

*We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.*

**Article. I., Section. 8.**

**Clause 3: To regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes;**



# CIRP

## R&D Strategy



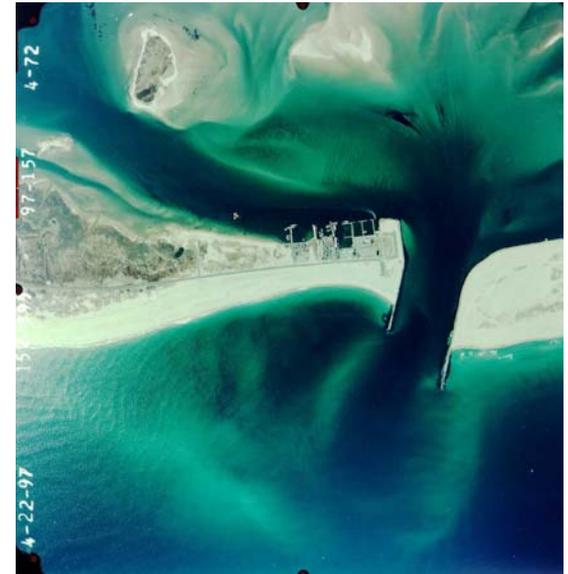
1. Emphasis on tool development
2. Products to Districts; private industry
3. Cover all relevant time & space scales
4. Cooperative efforts
  - Corps Districts – problem identification
  - Corps Districts & **CIRP** – data collection
  - **CIRP** – R&D & tech transfer
  - **CIRP** & Corps Districts – test technology
5. Balanced **CIRP** triangle



- **SMS:**  
main model-delivery system

Also....

- Stand-alone PC screening tools -  
e.g., Sediment Budget Analysis  
System (SBAS), inlet stability  
analysis, scour by jets, etc.
- ArcView-based tools – e.g.,  
BeachTools



## Types of Issues Addressed



- Advance (dredging) maintenance .....
- Optimization of channel performance .....
- Consequences of jetty modification .....
- Predictive capability .....
- Response of adjacent beaches ..
- Ebb/flood shoal mining .....
- Measurement & monitoring .....
- Scour prevention & reduction .....
- Efficiency of studies .....
- Section 111 studies .....



# CIRP

## R&D Work Units



- Inlet Modeling System ..... Mary Cialone
- Structures & Scour ..... Steve Hughes
- Physical Modeling & Engineering ..... Bill Seabergh
- Geomorphology & Channels ..... Nick Kraus
- Channels & Adjacent Shorelines ..... Julie Rosati
- Field Investigations ..... Thad Pratt
- Program Mgmt & Tech Transfer..... S. Knight, N. Kraus

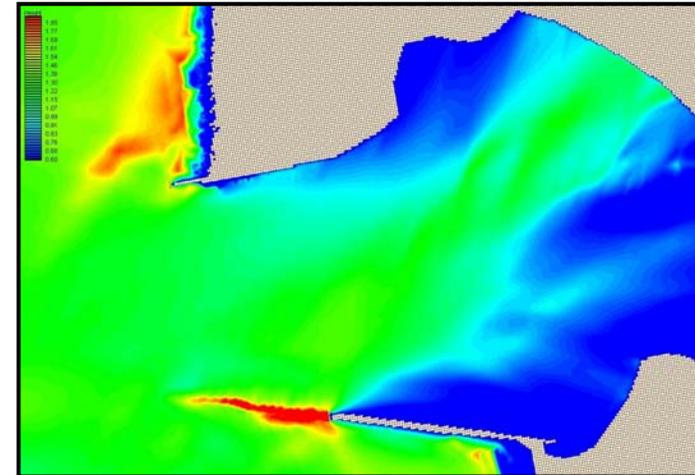


## 2. SMS

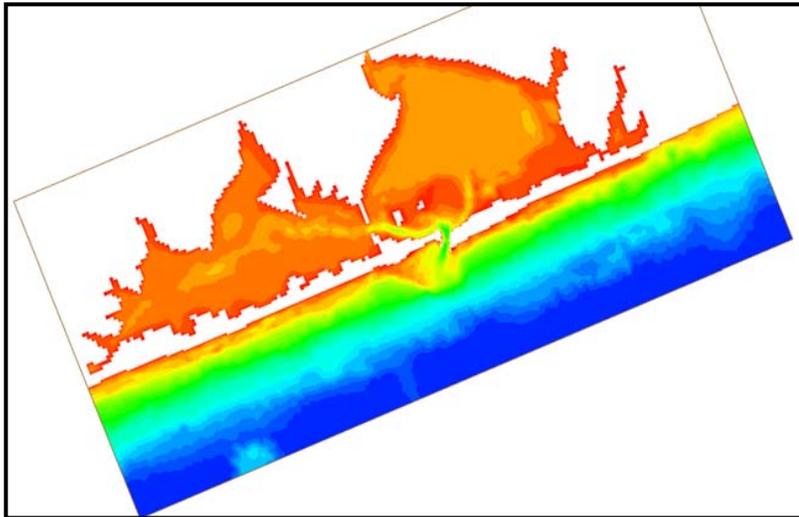
# CIRP modeling delivery system for...



1. **Intensive modeling** – organization of large projects, simple to complex models
2. **Reliable modeling** – well-tested models covering a wide range of conditions
3. **Integrated modeling** – model interconnectivity, range of processes, range of model choices
4. **Model-support tools** – grid development, coordinate conversion, model connectivity, post processing, animations, global comparisons, etc.



# CIRP & SMS Modeling System Development Schedule



- **Phase 2 (2003-2006)**

- 2D sediment transport & morphology change
- Morphology Steering Module
- 3D hydrodynamics & sediment transport
- Navigation channel performance & management models (new types of models)

- **Phase 1 (1997-2002)**

- 2D hydrodynamics (ADCIRC, STWAVE, M2D...)
- Hydrodynamics Steering Module (waves & currents)
- Basic SMS architecture for inlet modeling



# CIRP Modeling System Development

## Range of Activities



- **SMS** upgrades, refinements, addition of models
- **Steering Modules** (Hydrodynamics; Morphology)
- **Tidal databases** (East-Gulf Coast; West Coast)
- **ADCIRC** – regional oceanographic model
- **STWAVE** – wave model (w-c interaction; nested grids)
- **Nested modeling** – regional to project level (**M2D**)
- **Community grids**
  - Shared grids; grid archival, documentation, QC
- Coastal models – NEMOS-GENESIS, SBEACH, Cascade...
  - GENESIS-T (includes tidal current, water level)

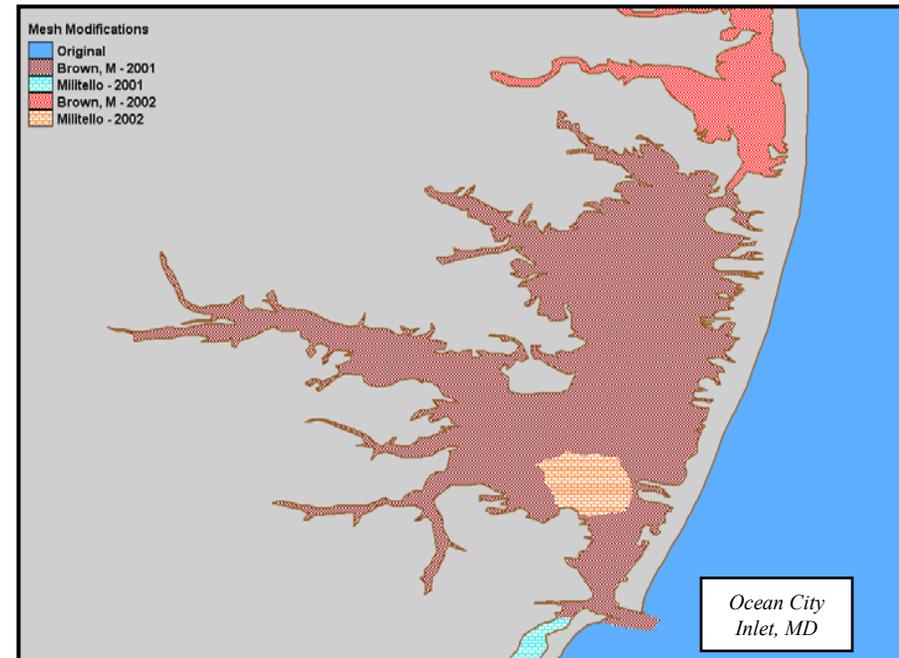


# CIRP

## Community Model Grids



- Now feasible to create regional grids & share them (also, local grids)
- Grids can be updated, QC'd, & made available to others
- **SMS** – provide capability to document grids – metadata
- **CIRP** Navigation Channel Resource Center (web-based map platform) disseminating community grids



# CIRP SMS Modeling System Development

## Closing Remarks



- **Reliable, well-tested models**
- **Network of users**
- **Integrated models (1D-3D) cover wide range of processes**
  - **Currents & waves (w/ other R&D program)**
  - **Sediment transport & morphology change**
  - **Channel infilling & inlet morphology change**
  - **Dredged material fate (w/ other R&D program)**
  - **Coastal models (w/ other R&D program)**
- **New models – channel performance & management**
- **Community grids – coming to a web site near you !!!**
- **Interested in your feedback**
- **Finally – thanks to instructors for incredible effort**

