

Coastal Inlets Research Program



Julie Dean Rosati

Program Manager

Jim Walker

HQ Navigation Business Line Manager

Jeff Lillycrop

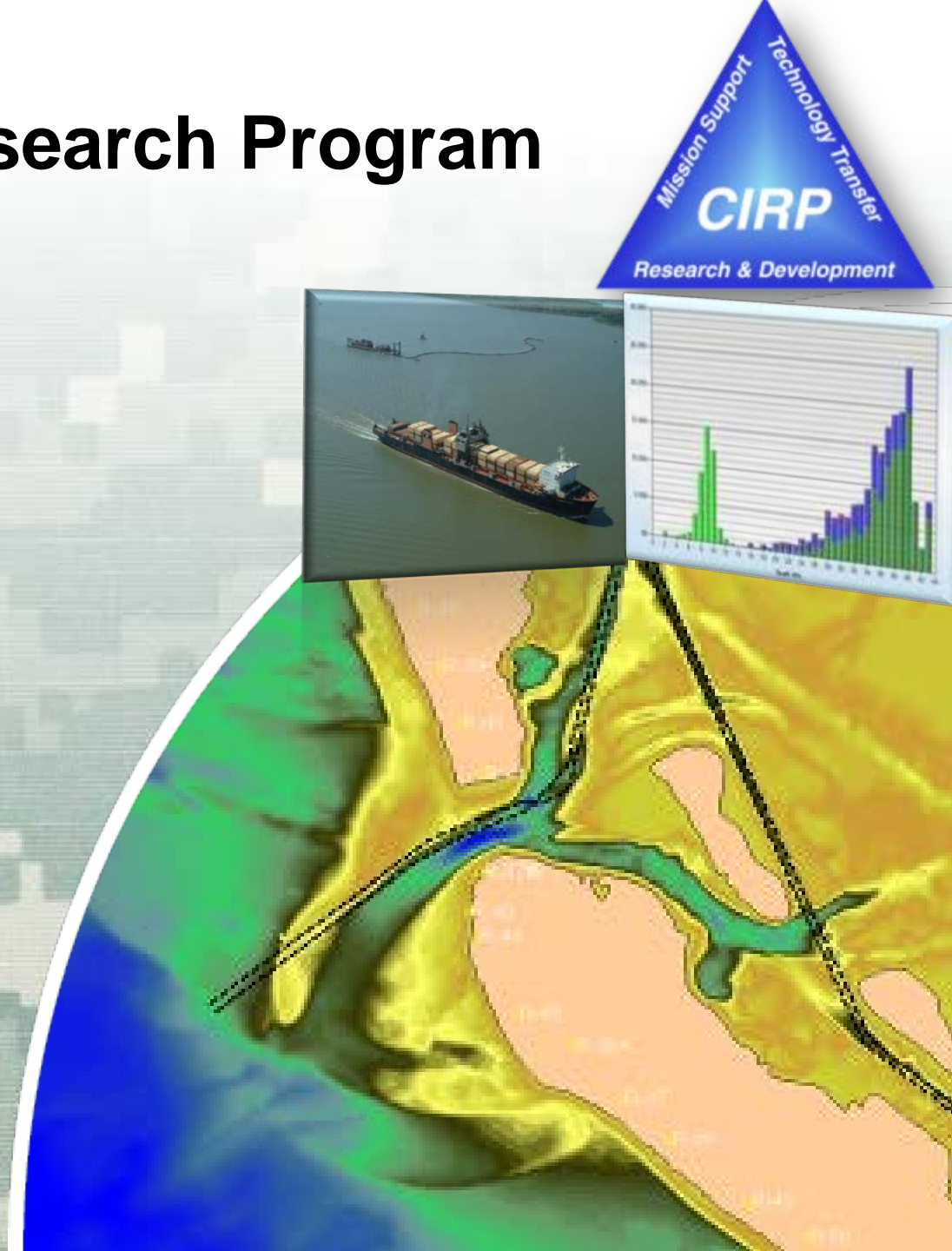
Technical Director

Eddie Wiggins

Associate TD



US Army Corps of Engineers
BUILDING STRONG



- Coastal Inlets Research Program

- Mission
- Technology and Products

- FY12 Activities - *Models in Surface-water Modeling System*

- Coastal Modeling System

CMS-Wave, CMS-Flow *SoN 2008-N-6: Long-term Morph Chg*



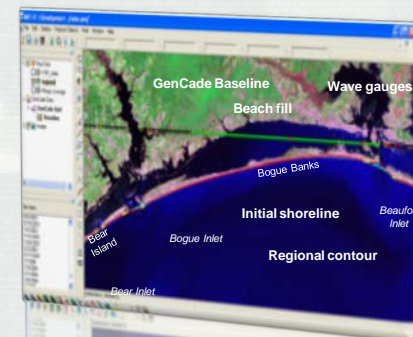
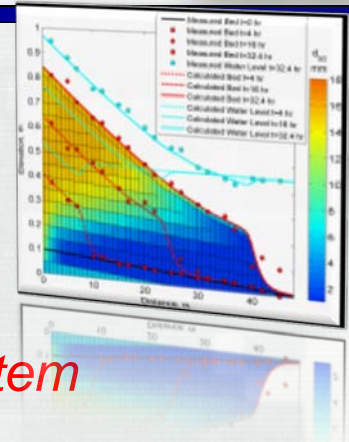
CMS-MixSed *Mixed cohesive/non-cohesive sediment transport as forced by waves and currents*



PTM for CMS *Upgrade to operate with telescoping grid*

- GenCade

SoN 2008-N-6: Long-term Morphology Chg





WebTools

- CPT, CSMART

SoN 2009-N-8: Justification for Dredging



- Berm Planning Calculator

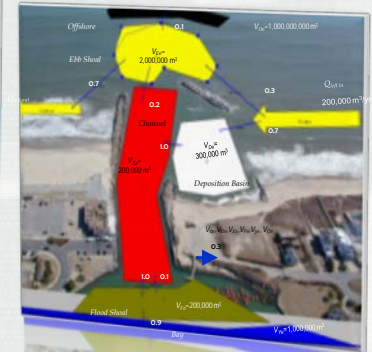
SoNs 2011-N-15b/19b: Nearshore Berms

- WaveNet

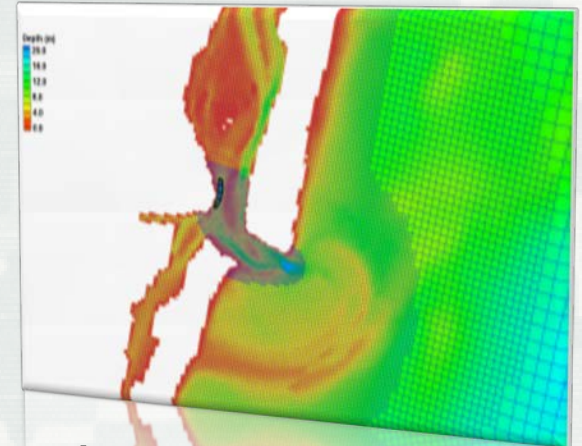
SoN 2011-N-10: Dynamic WebLink Environ

FY13 Proposed Activities

- Sea Level Rise Impacts on Coastal Navigation Projects *SoN 2012-N-11*
- Automated Feature Extraction for Sediment Budgets *SoN 2012-N-15*
- Validation Measurements *SoN 2009-N-5*



- Conduct R&D to reduce O&M costs at coastal navigation projects
 - Include inlets, entrances, ports, marinas, harbors, navigation structures, and adjacent beaches as influenced by metocean forcings.
- Develop tools to support O&M practice
 - Provide Districts tools for in-house PCs.
 - Tools to evaluate inlets, channels, structures, adjacent beaches, dredging and placement within a regional management practice.



- Transfer technology and products
 - Guidance documents, Workshops, models and tools, Web site, Wiki-pages, PC software, Web portals, Mobile device apps.

Coastal Inlets Research Program Mission Areas

Tools and Models:

CMS, CPT, CSMART,

GenCade, Inlet Res Model,

RMAP, Shoaling Toolbox,

CMS pre/post processing tools

WaveNet, Nearshore

Berm Calculator

Mission Support

Technology Transfer

CIRP

Research & Development

Tech Transfer:

Workshops, Website, Wiki,

Mobile apps, Video clips,

Webinars, TRs, TNs, JPs



R&D: *Berm migration, Mixed-grain sediment transport,
Long-term morphology change, Sand sharing relationships for inlets*

Program Management and Technology Transfer

Julie Rosati, Mitch Brown

Coastal Modeling System (CMS)

*Alex Sanchez
Honghai Li*



Waves at Navigation Structures

*Lihwa Lin
Zeki Demirbilek*

Geomorphic Evolution

Tanya Beck

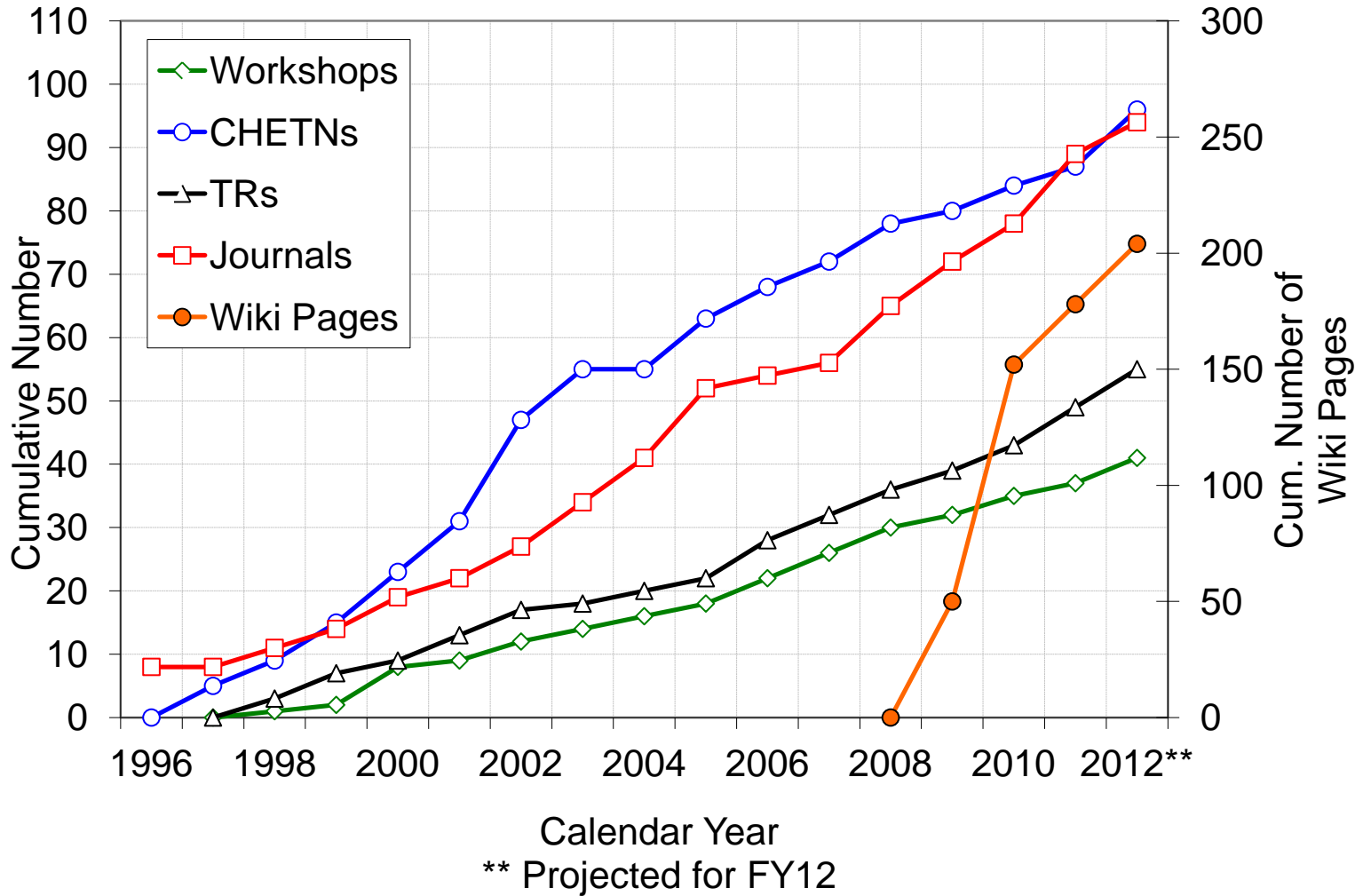
Inlet Engineering Toolbox

*Ashley Frey
Julie Rosati*

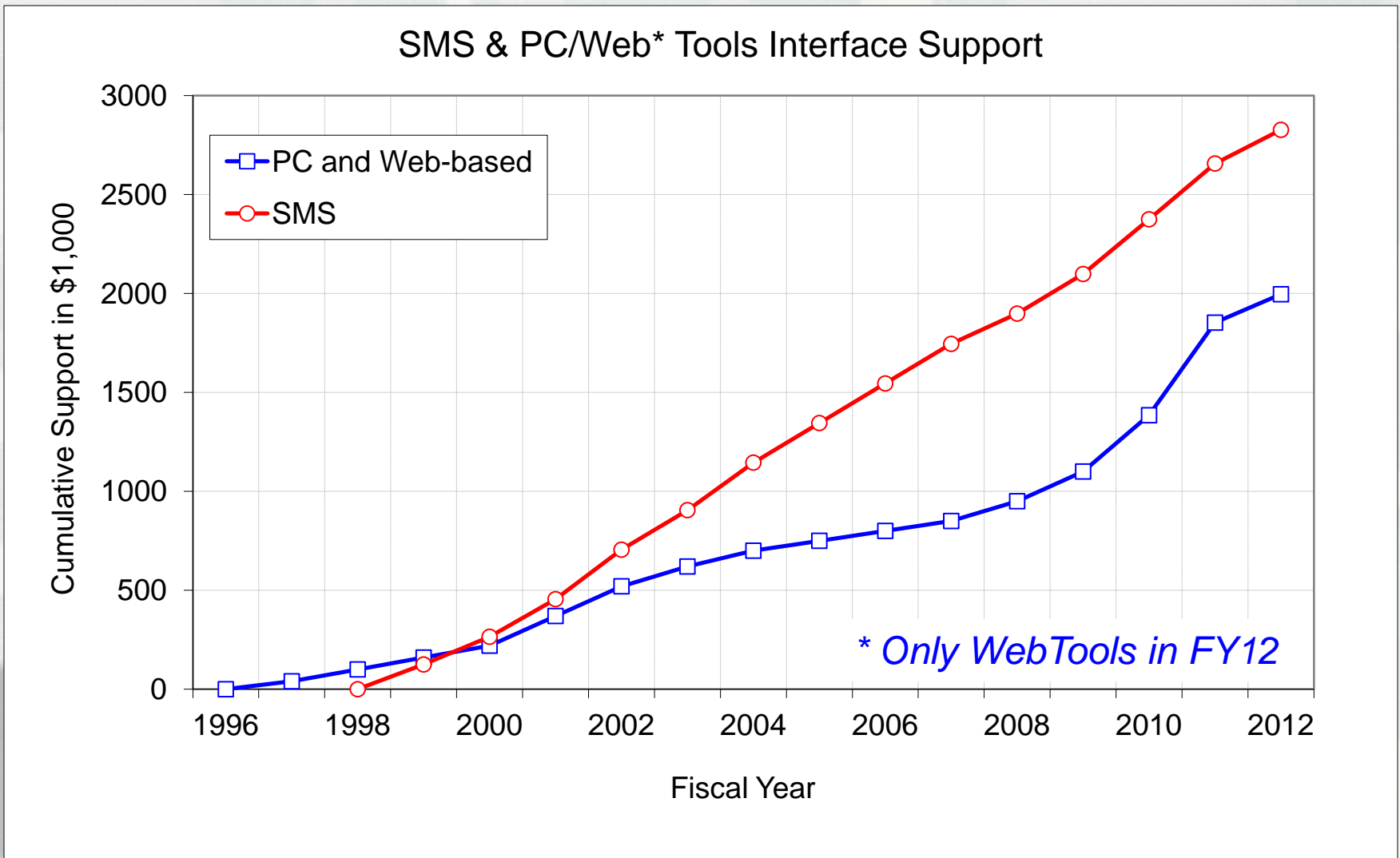
Coastal Navigation Portfolio Management

Ned Mitchell

CIRP Publications and Workshops



Investment Chart





Workshops, Nov98-Aug12



13 Years of Annual Workshops
40 Cumulative Workshops
3 Workshops (2 w/DOTS) and
3 Webinars in FY12

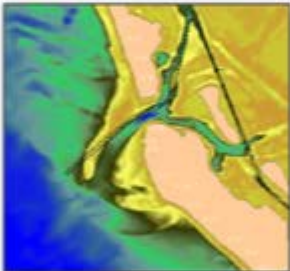
E & W Coasts, Nov 1998
#1 – FSBPA, Feb 2000
#2 – FSBPA, Feb 2001
#3 – FSBPA, Jan 2002
Jul 2002
#4 – FSBPA, Feb 2003
May 2003
#5 – FSBPA, Feb 2004
Aug 2004
#6 – FSBPA, Feb 2005
Aug 2005

I: Beginning CMS and SMS (Jun 11-15, 1-3 pm CDT)
II: Advanced CMS (Jun 18-22, 1-3 pm CDT)
III: GenCade (Sep 11-13, 1-3 pm CDT)
Register on CIRP Website

#7 – FSBPA, Jan/Feb 2006	Sarasota, FL	Modeling of waves, circulation, sediment transp. and morph. change
#8 – FSBPA, Jun 2006	Stennis Space Center, MS	Coastal Inlet Modeling System (CIMS) Workshop
#9 – FSBPA, Jan 2008	Vicksburg, MS	Advanced Coastal Modeling System Workshop
#10 – FSBPA, Feb 2008	Orlando, FL	Coastal Inlet Modeling System (CIMS) Workshop
#11 th Annual, Dec 2009	Seattle District, WA	Integrated Coastal Inlet Simulation with Applications
#12 FSBPA, Feb 2011	Jacksonville, FL	Modeling & Decision-Support for Coastal Inlets
Aug 2011	San Diego, CA	CMS&GenCade for Regional Sediment Management
#13 NAP, Mar 2012	Philadelphia, PA	Technology Transfer Workshop/Webinar
Jun (2), Sep 2012	Webinars	CMS and GenCade Webinars

Coastal Inlets Research Program

CIRP Numerical Model Tools and Capabilities








U.S. Army Engineer Research and Development Center
Coastal and Hydraulics Laboratory

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Coming Soon: Quick-Reference Summary of CIRP's WebTools

numerical model tools and capabilities

Model	What does it do?	What are typical time scales and platforms?	Where has it been validated?	What are advantages?	What are limitations?	Where do I find info?	Who is the main POC?
COUSS-1D/2D <i>Wave model for navigation, port/harbor, flood & risk assessment; decision support</i>	<ul style="list-style-type: none"> High-fidelity, advanced, most accurate model for short and long waves 1-10 km regions Wave-structure-ship interactions, ship wake Surf & wash zone waves (rip currents, runup/over-topping, infra-gravity & tsunami) 	<ul style="list-style-type: none"> 20 wave conditions run with rectangular grids in projects Can be used with one grid or grids for each project alternative Runs on PC, Linux, and HPCs (supercomputers) Hours to a week 	<ul style="list-style-type: none"> 13+ sites including coastal inlets, harbors, ports, flood control structures, and reefs 	<ul style="list-style-type: none"> Physics & process based; no empiricism Daily D&D model for nonlinear shallow-water waves Ideal for ports/harbors/marinas, & design/refurb of infrastructure 	<ul style="list-style-type: none"> Need expertise to run Time-consuming Not necessary for all coastal problems No winds No unstructured-grid capability 	 <ul style="list-style-type: none"> CIRP, NavSys, FDI, SWMS websites Knowledge Hub (KH) 	Dr. Zeki Demirbilek
CMS-Flow 2D, depth-integrated	<ul style="list-style-type: none"> Tidal flow, wave-induced currents, sediment transport, and morphology change Integrated with CMS-Wave 	<ul style="list-style-type: none"> Runs on multi-core desktop machines Typical simulation lengths of several months to years 	<ul style="list-style-type: none"> 20+ sites including coastal inlets, estuaries and beaches 	<ul style="list-style-type: none"> Integrated system Robust and fast Flexible Cartesian meshes SMS interface User-friendly 	<ul style="list-style-type: none"> Depth-integrated No boundary fitting capability No wash zone or cross-shore sediment transport (yet) 	 <ul style="list-style-type: none"> CIRP website KH 	Alex Sanchez
CMS-Wave 2D, depth-integrated	<ul style="list-style-type: none"> Full-plane spectral wave generation-transformation Integrated with CMS-Flow Designed for inlet applications 	<ul style="list-style-type: none"> Runs on PC in SMS, DOS Typical simulation lengths of several months to years 	<ul style="list-style-type: none"> 20+ sites: US East and West coasts, Gulf of Mexico 5+ laboratory and theoretical studies 	<ul style="list-style-type: none"> Efficient SMS interface Theoretical-based wave diffraction, reflection Includes structure-wave interactions 	<ul style="list-style-type: none"> Empirical wave-breaking formula Structured grid 	 <ul style="list-style-type: none"> CIRP website KH 	Dr. Lihua Lin
GenCade 2D regional reach and inlet shoal evolution model	<ul style="list-style-type: none"> Can represent coastal structures, beach fills, dredging and placement Includes Inlet Reservoir Model* to account for inlet shoal and channel evolution *Also available in PC version 	<ul style="list-style-type: none"> Runs on PC in SMS Years to multiple decades representing 1-10 years 	<ul style="list-style-type: none"> Basic V&V completed 5+ sites: Orinow Bay, NC; Sargent Beach, TX; St. Johns County, FL; Point Lookout, NY 	<ul style="list-style-type: none"> User-friendly, easy to learn Conceptual model + fast grid creation and set up Integrates cumulative projects Fast 	<ul style="list-style-type: none"> Empirically based sand transport Explicit solution scheme (solution stability) Constrained by standard 1-line model assumptions 	 <ul style="list-style-type: none"> CIRP website KH 	Ashley Frey
PTM Particle Tracking Model, for 2D/3D hydro models	<ul style="list-style-type: none"> Joint DOER-CIRP product Coupled to CMS by CIRP Predicts particle transport pathways and fate SMS based interface 	<ul style="list-style-type: none"> Accepts input from CMS and other hydro and wave models Runs on desktop PCs and HPCs (super-computer) Seconds to hours 	<ul style="list-style-type: none"> Basic V&V completed Detailed V&V studies in progress 	<ul style="list-style-type: none"> Fast and efficient Flexible; not tied to any hydro or wave model SMS interface connects to flow and wave models 	<ul style="list-style-type: none"> Not designed for sediment transport calculations Some empirical formulas Too many particles can slow runtimes 	 <ul style="list-style-type: none"> CIRP, DOER websites KH 	Dr. Tabitha Lackey (DOER), Ronghui Li (CIRP), Zeki Demirbilek (CIRP & DOER)



CIRP



Technology & Products*

IRIP
MCNP


SERDP

Surface Water Modeling System

Web-Tools and Guidance

Mobile Device Applications

CMS

- CMS-Wave
- CMS-Flow
- PTM 

GenCade

Bouss-2D

CPT and CSMART

CHANNEL SHOALING TOOLBOX

CIRP Website & Wiki 

Inlets  online

INLETS DATABASE Section 111

Toolbox Berms  online 

Nearshore Berm 
MBO 
Web Calculator
WaveNet

CPT-LITE 

CIRP WEBSITE 

PC Tools

Inlet Reservoir Model

RMAP

SBAS-PC



CIRP



Technology & Products*

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CPT and CSMART

Nearshore Berm Calculator

CPT-LITE 

CHANNEL SHOALING TOOLBOX

MetOcnDat: WaveNet

CIRP WEBSITE 

IRM Webtool

PC Tools

GenCade

CIRP Website & Wiki  Find us on Facebook

Inlets  online

Berms   online

Inlet Reservoir Model

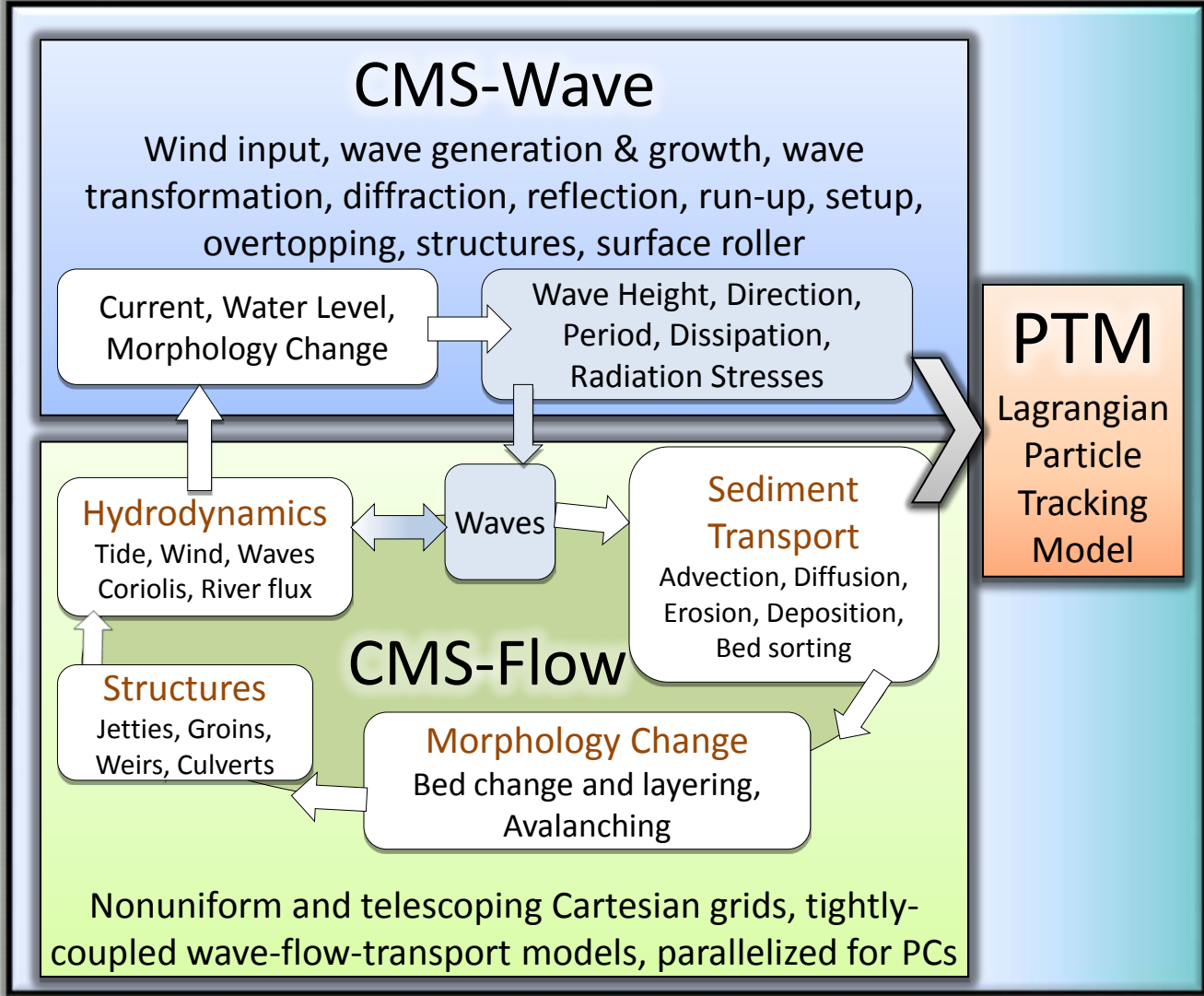
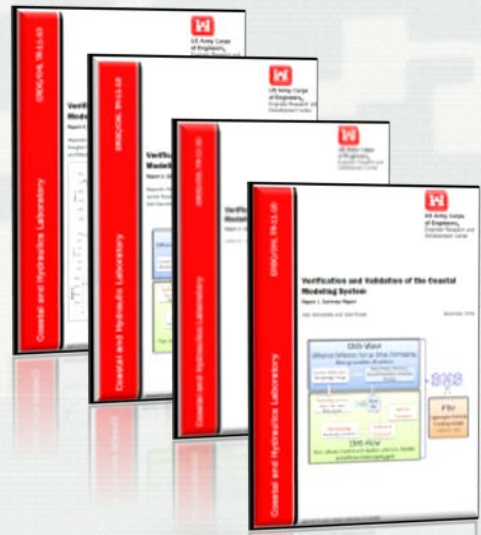
INLETS DATABASE

Section III

Toolbox

What is the CMS?

Integrated wave, current, and morphology change model in the Surface-water Modeling System (SMS).



Why CMS?

Operational at 12 Districts

Practice-oriented: *1 day simulation ~ 1 hr on PC!*

Integrated system for wave-current-morphology modeling

4 Verification & Validation reports document theoretical, laboratory, and real-world applications

Approved by H&H CoP for use in USACE applications

Recent Tech Transfer activities

Feb 2011: Jacksonville, FL

Sep 2011: San Diego, CA

Nov 2011: New York District, NY (DOTS)

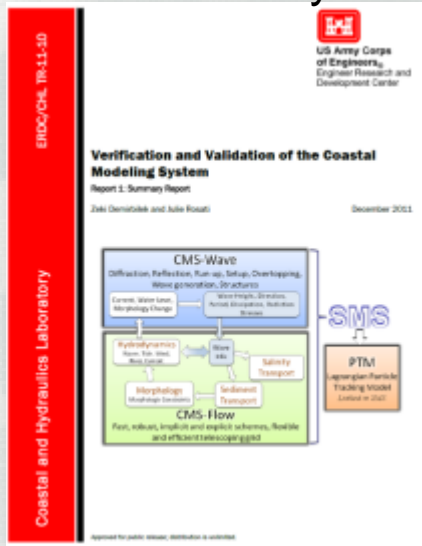
Feb 2012: Baltimore District, MD (DOTS)

Mar 2012: Philadelphia, PA



- Documents goodness-of-fit statistics for CMS applications:
 - 9 Analytical Cases
 - 13 Laboratory Cases
 - 21 Field Cases
- V&V Study established data bank for coastal wave, flow, and sediment transport model validation


1: Summary



Verification and Validation of the Coastal Modeling System
Report 1: Summary Report
Zaki Demirebilek and Julie Rosati
December 2011

The cover features a flowchart of the Coastal Modeling System (CMS) components: CMS-Wave (Diffraction, Reflection, Run-up, Setup, Overlapping, Wave generation, Structures), CMS-Flow (Fast, robust, implicit and explicit schemes, flexible and efficient teleoperating), Hydrodynamics (Wave field, Wave force), Morphology (Hydrodynamic-Structure interaction), Sediment Transport, and Safety Transport. It also includes the PTM (Lagrangian-Particle Tracking Model) and the ERDC/CHL TR-11-10 logo.

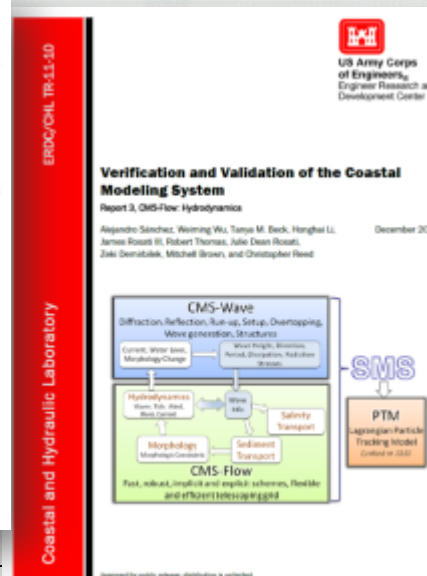
2: Waves



Verification and Validation of the Coastal Modeling System
Report 2: CMS-Wave
Linda Liu, Zaki Demirebilek, Will Thomas, and James Rosati, Jr.
December 2011

The cover displays a 3D surface plot of wave height and a 2D line graph showing wave characteristics over time. It includes the ERDC/CHL TR-11-10 logo and the Coastal and Hydraulics Laboratory name.

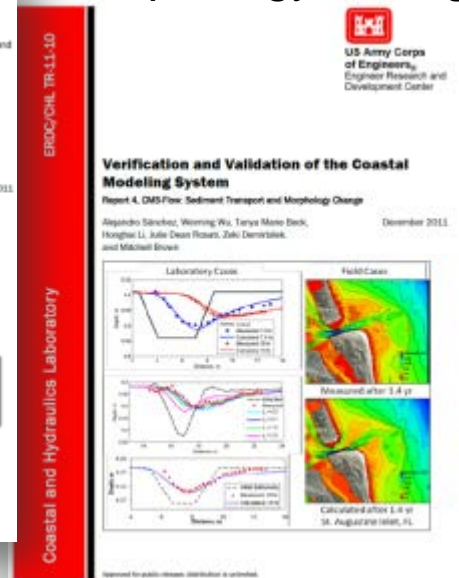
3: Flow



Verification and Validation of the Coastal Modeling System
Report 3: CMS-Flow: Hydrodynamics
Alejandro Sánchez, Weiming Wu, Tanya M. Beck, Honghai Li, James Rosati Jr, Robert Thomas, Julie Dean Rosati, Zaki Demirebilek, Mitchell Brown, and Christopher Reed
December 2011

The cover features the same CMS flowchart as Report 1, highlighting the CMS-Flow component. It includes the ERDC/CHL TR-11-10 logo and the Coastal and Hydraulics Laboratory name.

4: Sediment Transport & Morphology Change

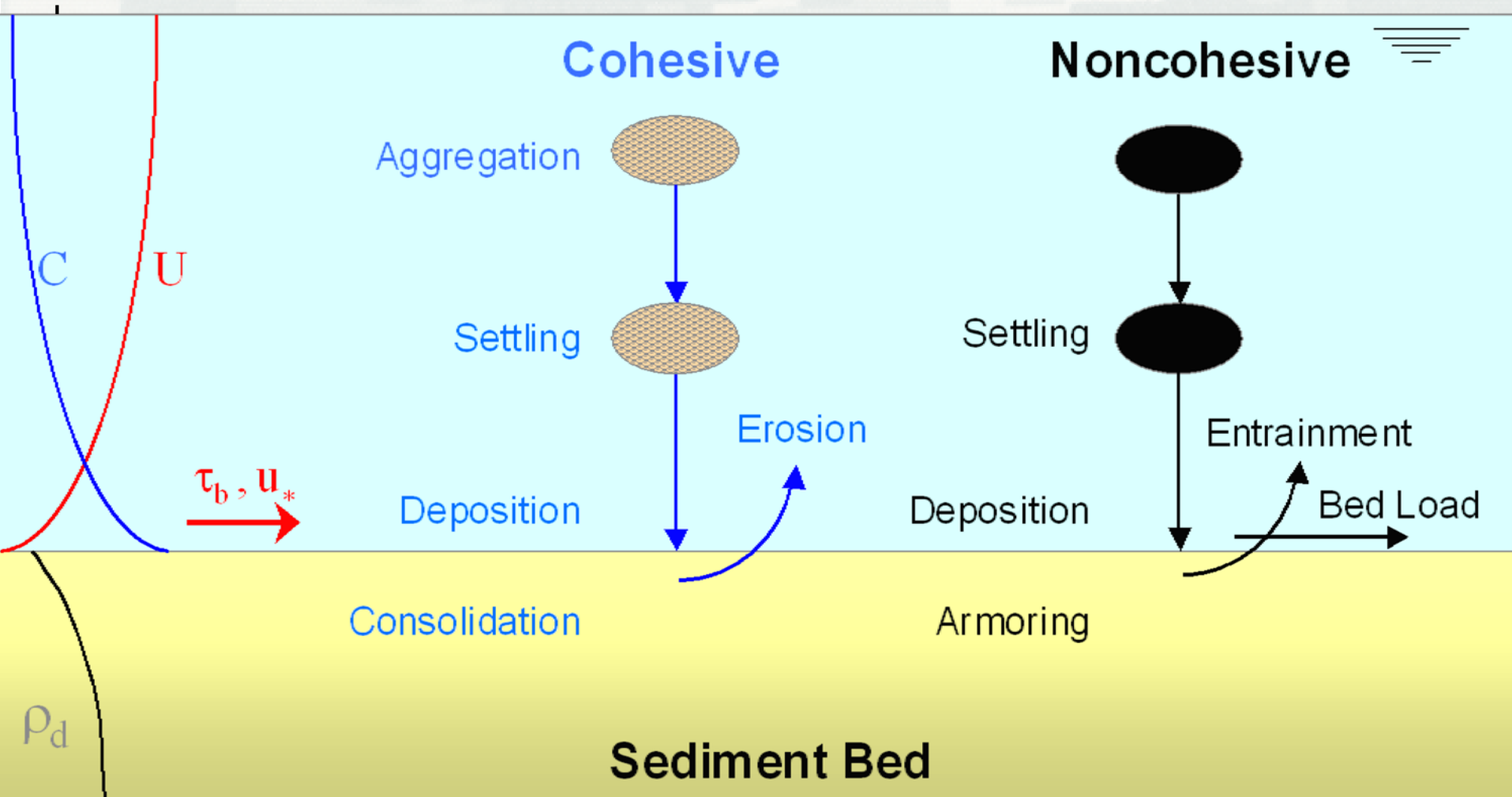


Verification and Validation of the Coastal Modeling System
Report 4: CMS-Flow Sediment Transport and Morphology Change
Alejandro Sánchez, Weiming Wu, Tanya Marie Beck, Honghai Li, Julie Dean Rosati, Zaki Demirebilek, and Mitchell Brown
December 2011

The cover displays a comparison between Laboratory Cases and Field Cases. It includes plots of sediment transport and morphology change, along with a map of a field site. It features the ERDC/CHL TR-11-10 logo and the Coastal and Hydraulics Laboratory name.

What is MIXSED?

Sediment bed model that enables representation of multiple size classes of cohesive and non-cohesive sediment in coastal projects



Simulates erosion and transport of mixed cohesive and non-cohesive sediment under **combined wave & currents**

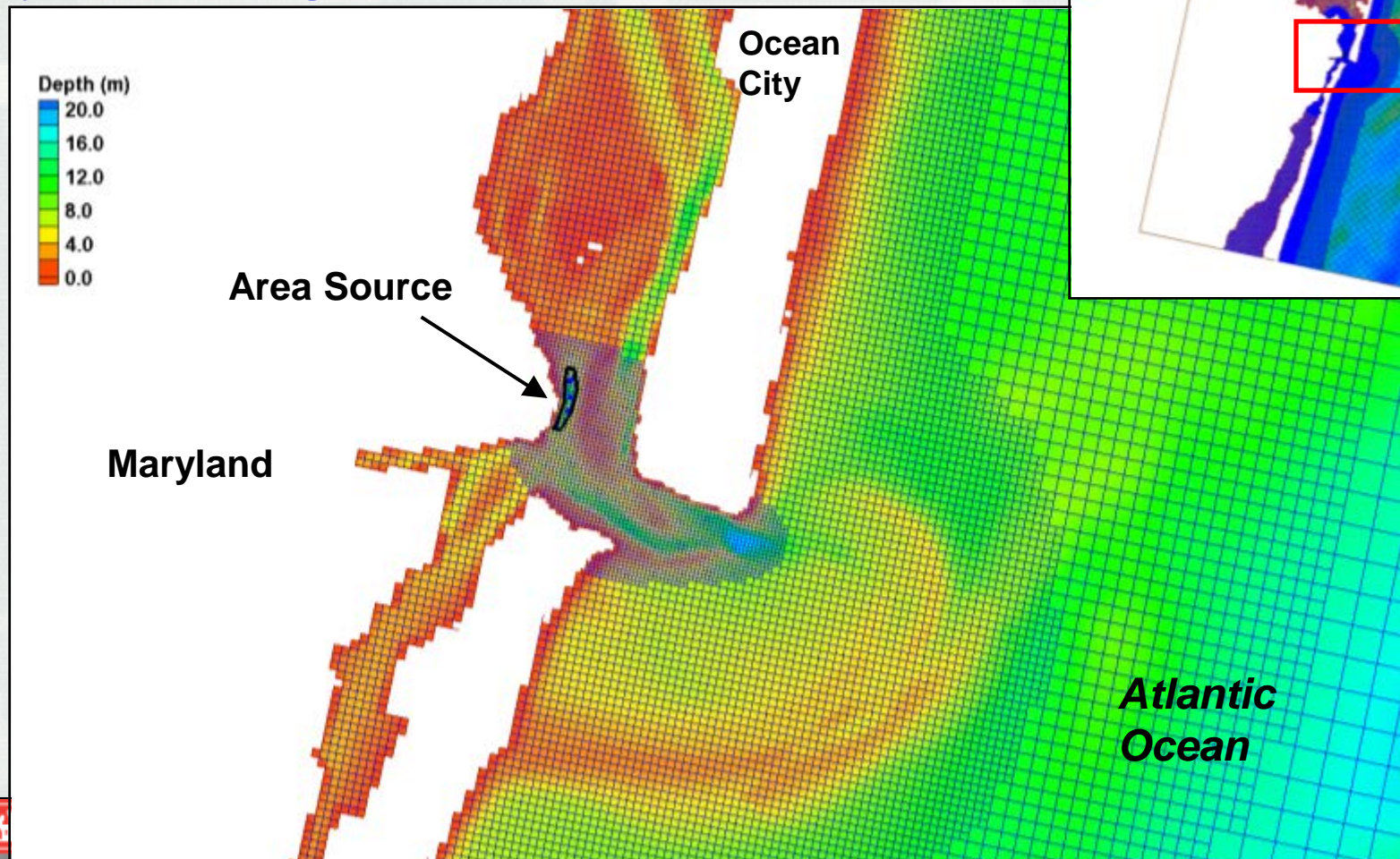
- Nearshore & offshore O&M placement of mixed cohesive/non-cohesive sediments
- Sediment transport of mixed sediments in inlets, harbors, bays
- Examples:
 - Mobile Bay, AL
 - Galveston Bay, TX
 - Buzzards Bay, MA
 - Upper Cook Inlet, AK

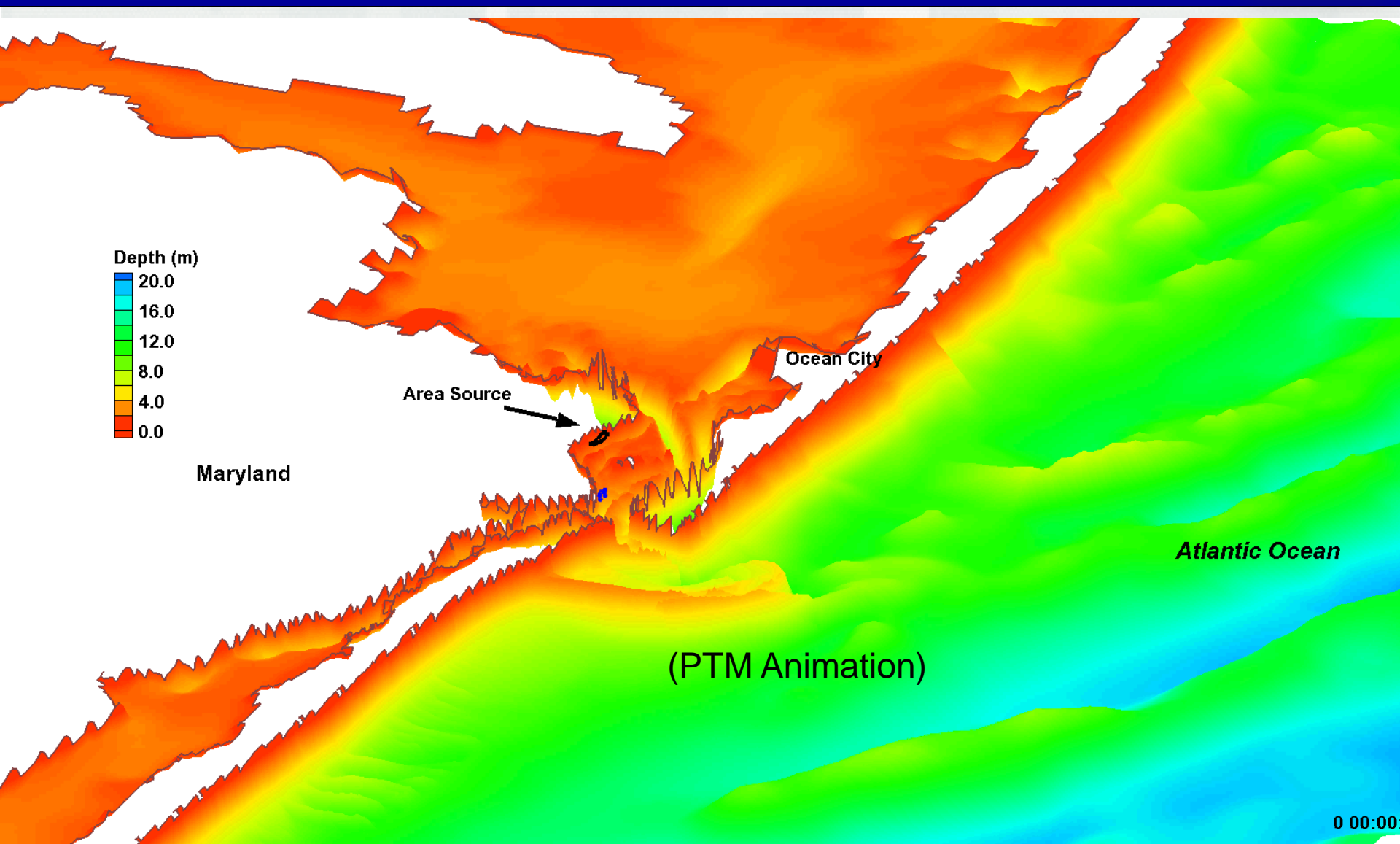


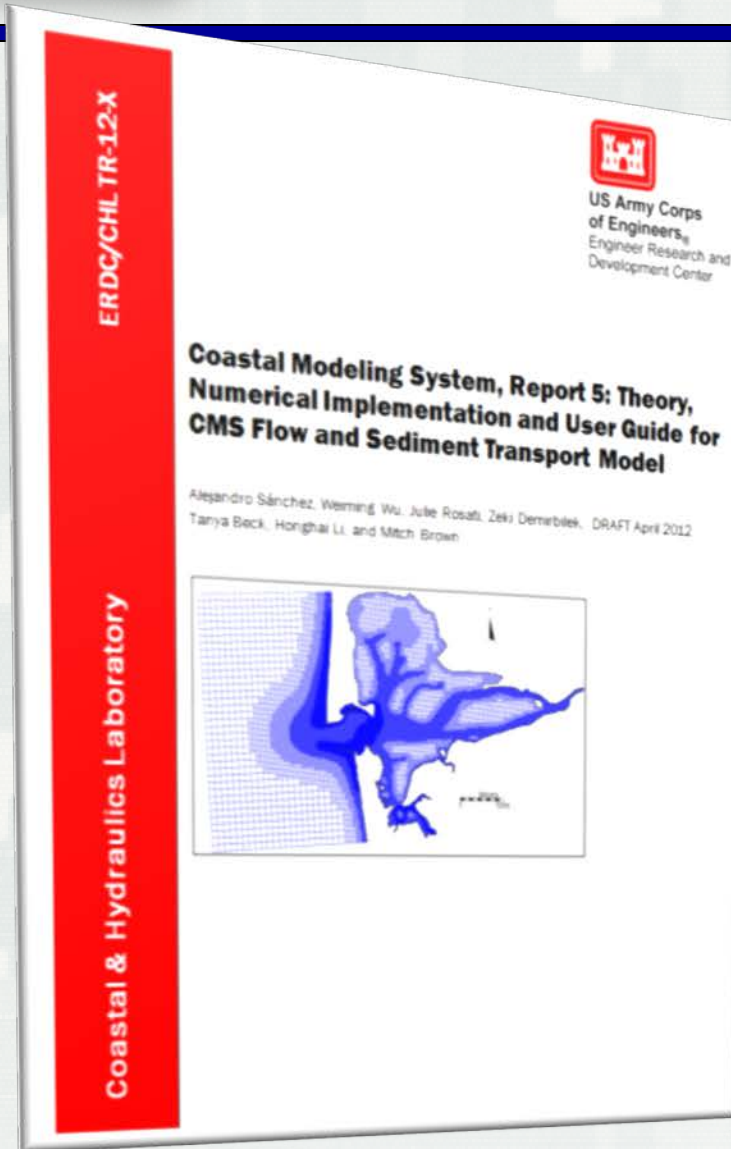
Particles released from deep scour hole

Particle size released (silt): 0.02 mm

Hydrodynamic forcing: Tide and waves







CMS-Flow and Sediment Transport: Theory, Numerical Implementation & User's Guide

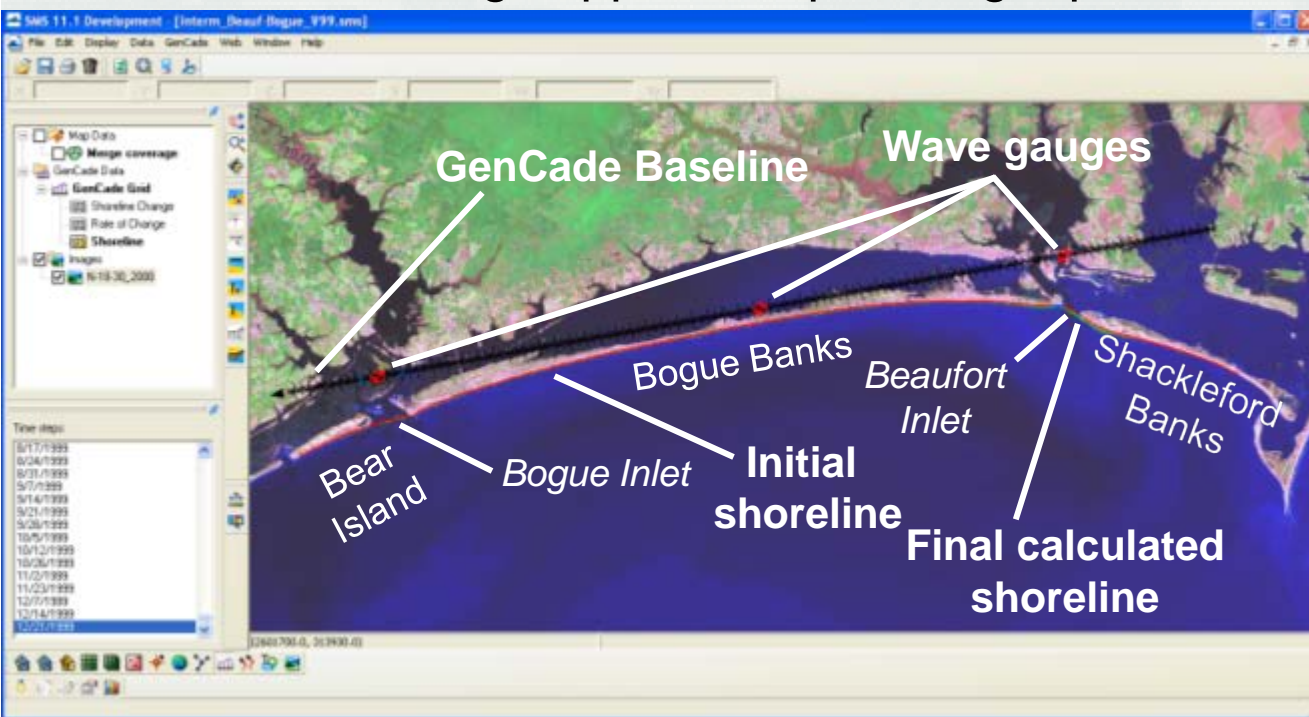
- Theory
 - Hydrodynamics
 - Salinity
 - Sediment Transport
- Numerical Methods
- User's Guide
- Appendices: Input and Output Files

Visit the
CMS/PTM
Booth!



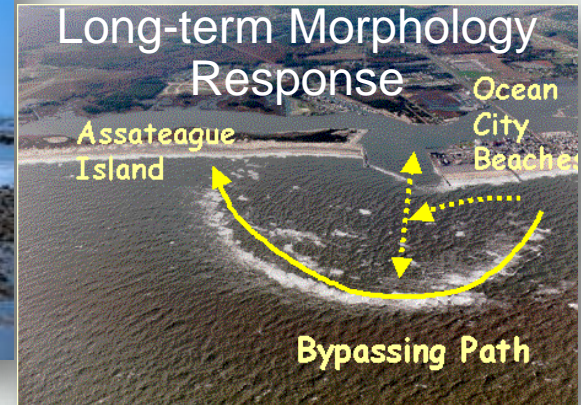
What is GenCade?

- Integrated GENESIS and Cascade models for shoreline change and sand sharing with inlet channels and shoals.
- Connects inlets, navigation channels, ebb and flood shoals, beaches, and engineering activities in a regional framework.
- Decision-making support for planning, operation, and engineering.



Second GenCade Workshop, Aug '11





Why GenCade?

- Sediment storage and transfer (bypassing, back-passing)
- Navigation channel maintenance
- Multiple interacting inlet dredging & placements on beaches
- Cumulative impacts
- Sources & sinks (shoal dredging and beach nourishment)
- Compatibility with previous calculations
- In SMS 11.1; PC, user-friendly interface for engineers & scientists



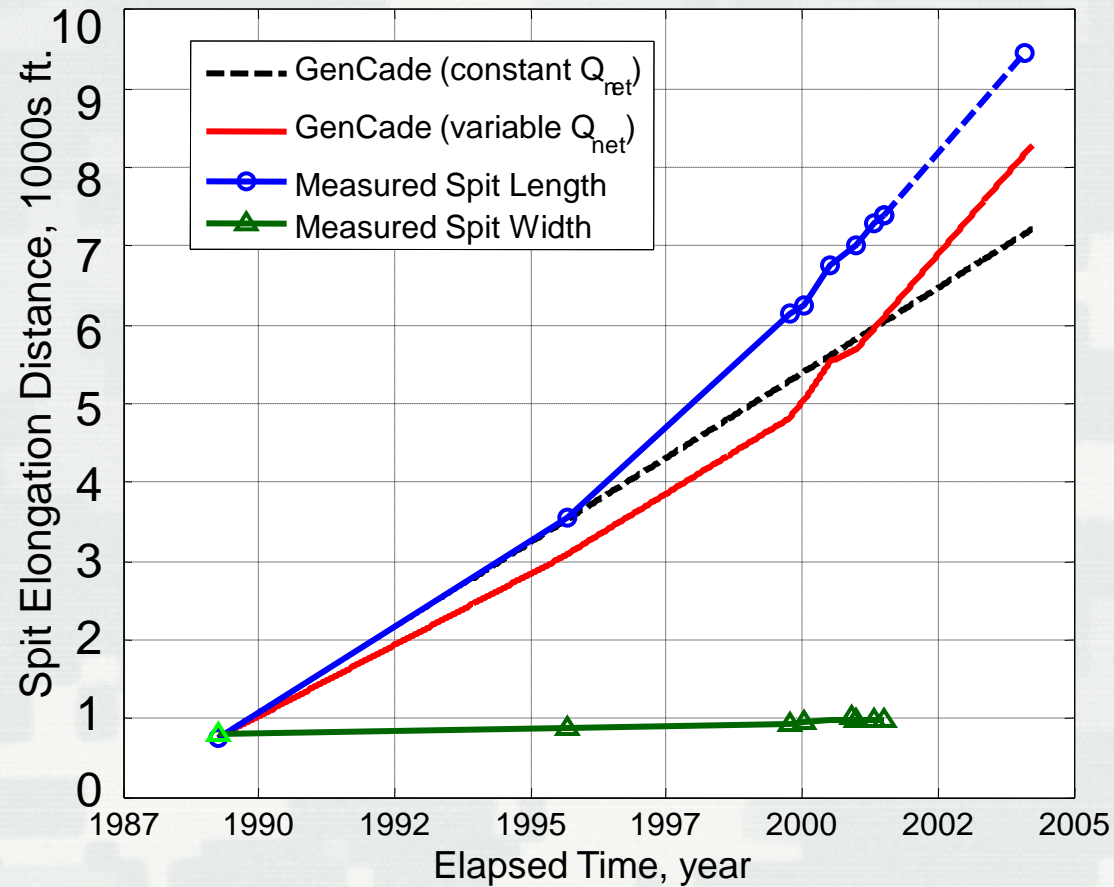
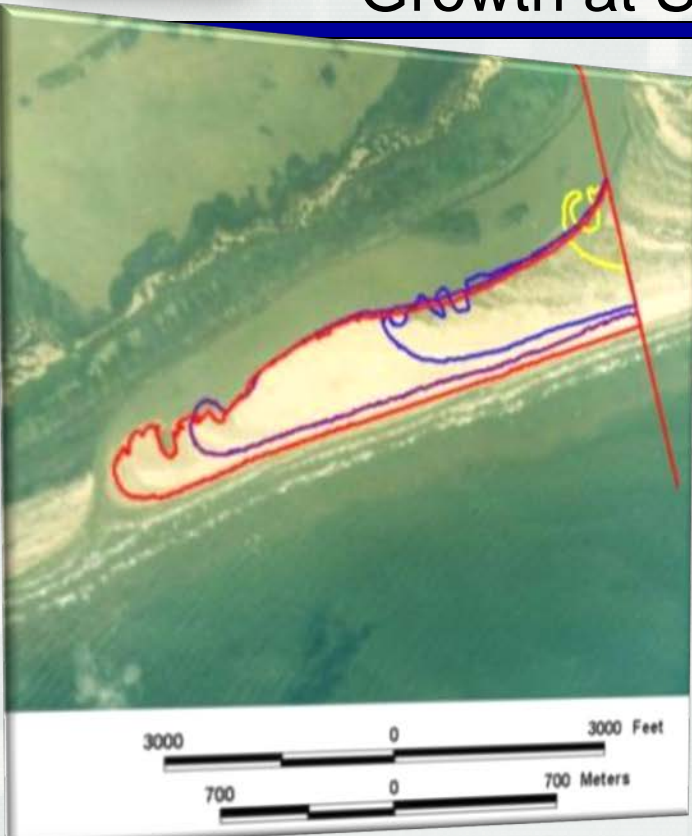
GenCade Model Theory & User's Guide

- Theory
- Validation
- Interface & User's Guide
 - Input & output files
 - Conceptual model
 - Visualization
 - Calibration & developing alternatives
- Application to Long Island, NY



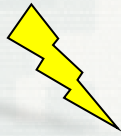
Classic Groin Response: Cape May, NJ

GenCade FY12 Accomplishments: Spit Growth at San Bernard River Mouth, TX



Statements of Need

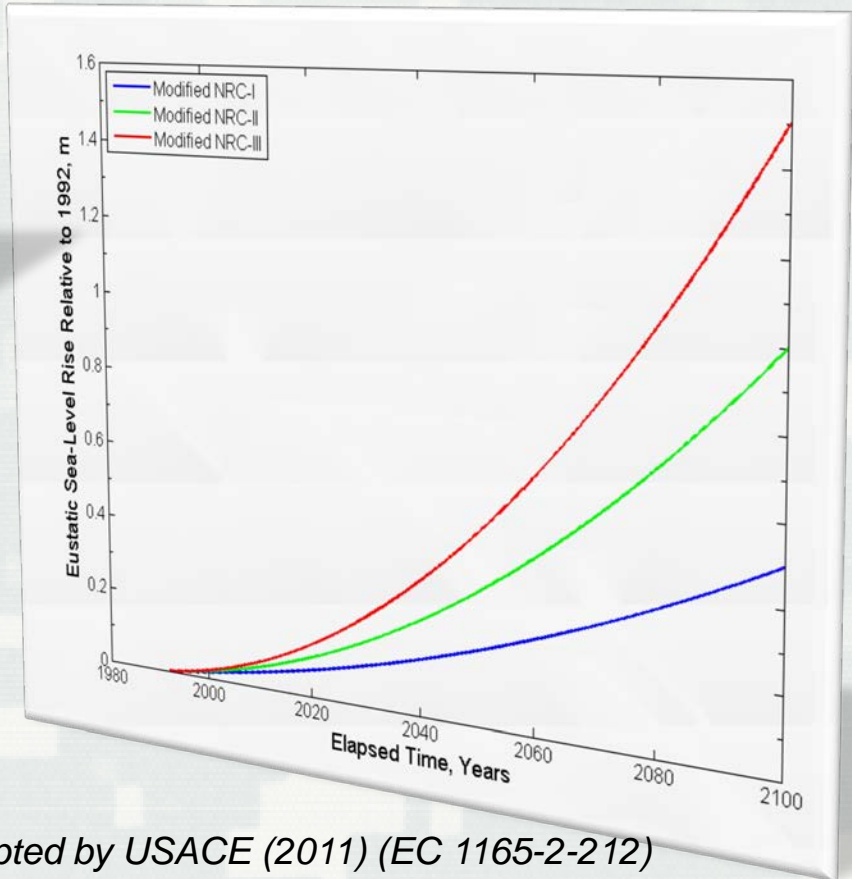
Need long-term morphologic evolution predictors
Tracking Number 2008-N-6



Incorporating Sea Level Change (SLC) into GenCade Calculations*

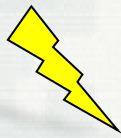
- Incorporate USACE (2011) methods for range in SLC as GenCade input
- Add change in sea level into GenCade calculations

Engineering and planning incorporating SLC can be investigated with GenCade

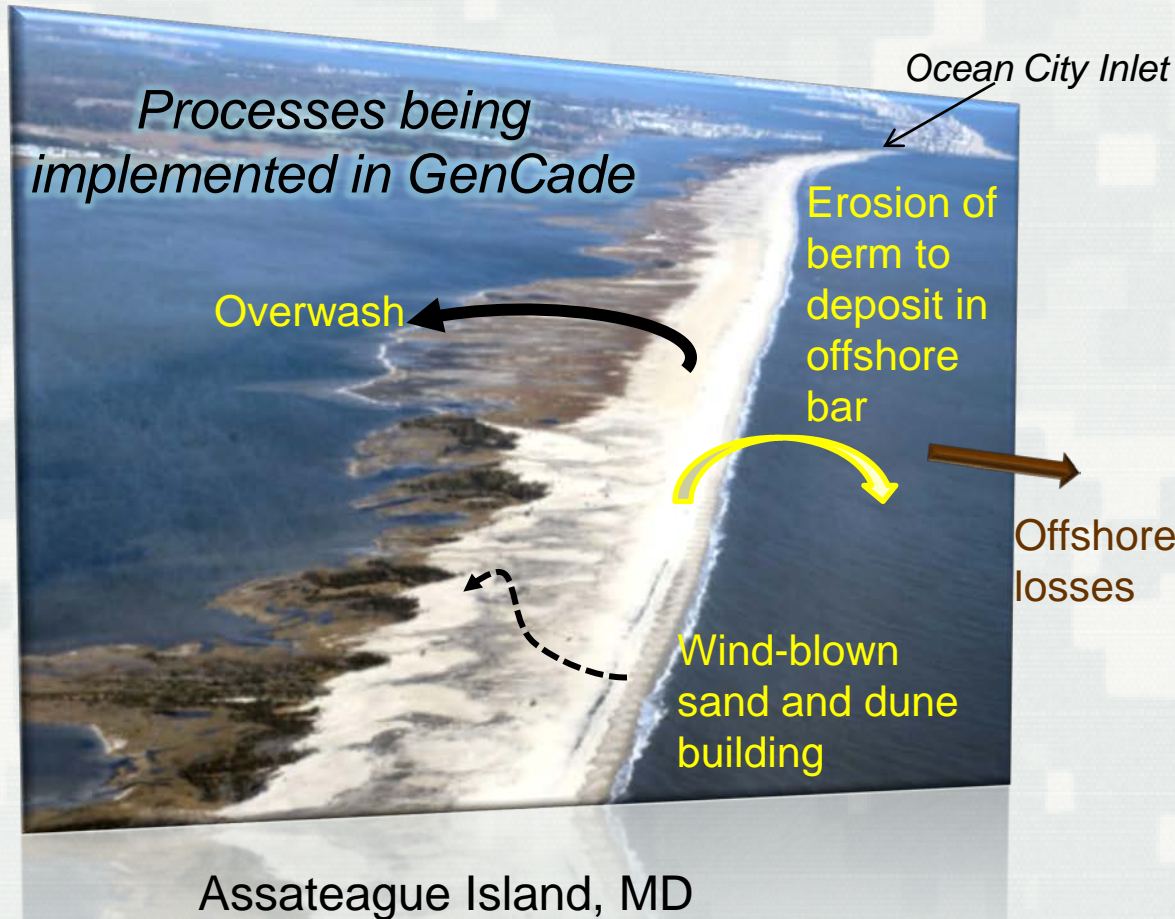


*SLC is presently considered in GenCade applications in an ad hoc manner

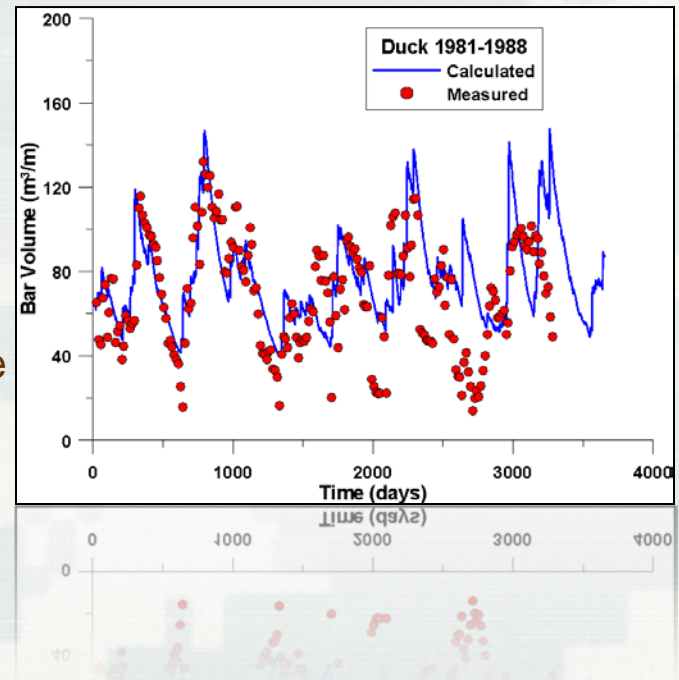
Adopted by USACE (2011) (EC 1165-2-212)
Based on updates to NRC 1987 equation

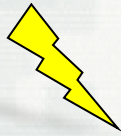


Incorporating Cross-Shore Transport in GenCade

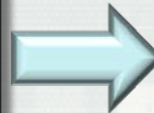


Example comparison between measured and calculated bar volume, Duck, NC





CMS-Wave
Wind input, wave generation & growth, wave transformation, diffraction, reflection, run-up, setup, overtopping, structures, surface roller

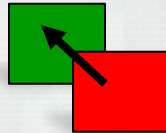


GenCade

Option for GenCade to accept forcing from an external wave model

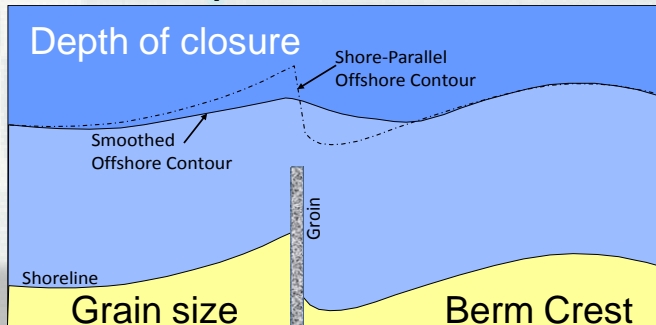
GenCade →

SBAS Arc10



GenCade output used as input to create an SBAS Calculated Sediment Budget

Variable alongshore parameters



Wiki-TN: Standard Methodology for Calibration and Validation

- *Statistical toolkit*
- *Recommended statistics for acceptable Cal/Val*
- *Standard, unified approach*

Visit the
GenCade
Booth!



CIRP



Technology & Products*

MCNP

SERDP

Surface Water Modeling System

Web-Tools and Guidance

Mobile Device Applications

CMS

- CMS-Wave
- CMS-Flow
- CPTM



GenCade

Bouss-2D

CPT and CSMART

CHANNEL SHOALING TOOLBOX

CIRP Website & Wiki



Inlets **online**

Berms **online**

INLETS DATABASE

Section III

Toolbox

Nearshore Berm Calculator

MetOcnDat: WaveNet

IRM Webtool



PC Tools

Inlet Reservoir Model

What is CPT?

Web-based application that relates navigable depths to cargo most vulnerable to shoaling. Allows for detailed, reach-level analysis as well as regional and national summaries of the **waterborne transportation systems** supported by Corps navigation projects.

<https://cpt.usace.army.mil>

CPT uses data provided by the Waterborne Commerce Statistics Center (WCSC), and is available via the OMBIL portal.

Statements of Need

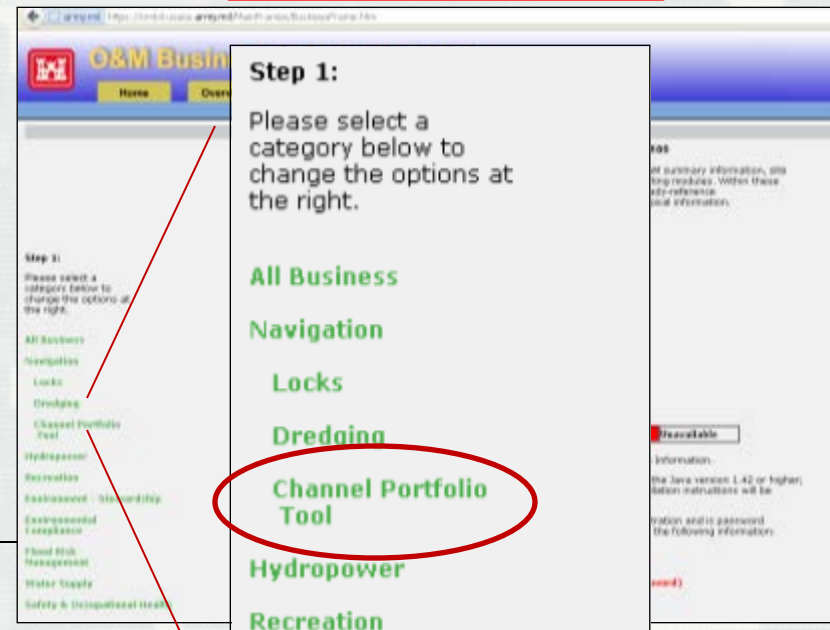
Improved Justification for and Prioritization of Annual Maintenance Dredging Investments
Tracking Number 2009-N-8



Channel Portfolio Tool (CPT)

The Channel Portfolio Tool (CPT) is a web-based decision-support package developed within the Coastal Inlets Research Program (CIRP) for determining the extent to which Corps-maintained navigation channel depths are utilized by commercial shipping. CPT uses the proprietary, dock-level tonnage database maintained by the Waterborne Commerce Statistics Center (WCSC), part of the Corps' Navigation Data Center (NDC). CPT provides an objective, consistent basis by which channels may be quickly compared to others for prioritization of Operation & Maintenance (O&M) funding, thereby providing improved justification for annual dredging budget items. Since its inception in 2008, CPT has evolved from a proof-of-concept tool covering only a few deep-draft ports into a mature, robust analysis package covering the entire navigation portfolio of projects. The live web version of CPT is presently available to Corps personnel at: <https://t01s01.usace.army.mil/CPT/web/>.

Read More...



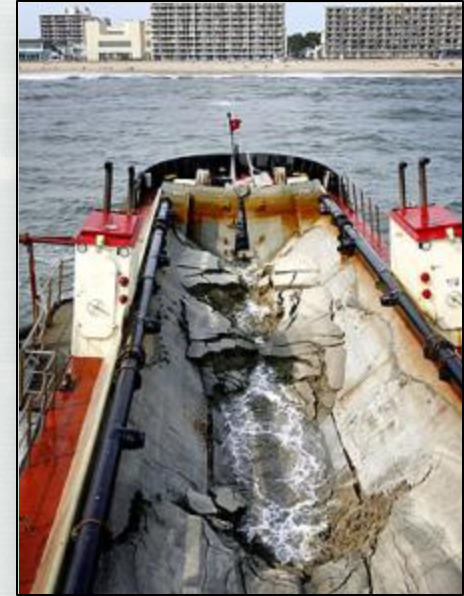
Step 1:

Please select a category below to change the options at the right.

- All Business
- Navigation
- Locks
- Dredging
- Channel Portfolio Tool**
- Hydropower
- Recreation

Why CPT?

- Navigation project managers need consistent, objective data to justify funding for O&M dredging requests.
- OMB has indicated that improved O&M justification is a precondition for increased outlays from the Harbor Maintenance Trust Fund (HMTF).
- CPT conducts the data processing and filtering necessary for system-level analysis and performance evaluation.



Channel Portfolio Tool (CPT)

Channel Portfolio Tool - CPT - Mozilla Firefox

<https://cpt.usace.army.mil>

 Channel Portfolio Tool

[Structure](#) [FAQ](#) [Home](#) [Register](#) [Log On](#) [Contact Us](#)

WARNING These pages contain commercially sensitive statistics pertaining to rivers, harbors, and waterways and must be held in strict confidence as required by 33 C.F.R. § 209.320. Unauthorized disclosure could result in loss of employment, fines, and imprisonment under 18 U.S.C. § 1905.

Steps for gaining access to CPT:

1. Electronically sign the WCSC non-disclosure document. Then save and send as an attachment to CPT@usace.army.mil. If electronic signature capability is not available then print the document, manually sign it, scan it and send as an attachment to CPT@usace.army.mil
2. Read and print out the Census non-disclosure document. Manually sign the document, scan it, and send as an attachment to CPT@usace.army.mil. This document MUST contain a manual signature.
3. After selecting the "Register" tab above, fill out all required registry information and select the "Register" button at the bottom of the screen.

[Waterborne Commerce Non-Disclosure \(WCSC\)](#) [Census Non-Disclosure](#) [Foreign Trade Statistics Security Guidelines Handbook](#)

You must agree to both the Waterborne Commerce and Census Non-Disclosure statements in order to view any data. You can either agree or disagree by checking the associated checkbox while registering or logging in and updating your user profile by clicking profile on the menu above and choosing update profile.

Once per year, on the first use after January 1st, you will be required to agree to the Non-Disclosure agreements in order to view the associated analysis data. To do this, use the appropriate forms above and email the signed forms to CPT@usace.army.mil. Electronic signatures are allowed for the WCSC Non-Disclosure. Once signed and approved, you will be able to use the tool. If you can login, but can only see the Profile tab, then you have not been approved and need to resubmit your signed Non-Disclosure forms or your password has expired and you need to change your password.

Visit the
CPT Booth!

help USACE operations personnel analyze the extent to which maintained navigation channels are used by commercial shipping. Analyses can be performed on a regional or project basis, or on a grouping of channels treated as a single project. Additionally, USACE planning personnel can use CPT to extract historical data concerning regionally aggregated statements of traffic for arbitrary listings of projects and channels.

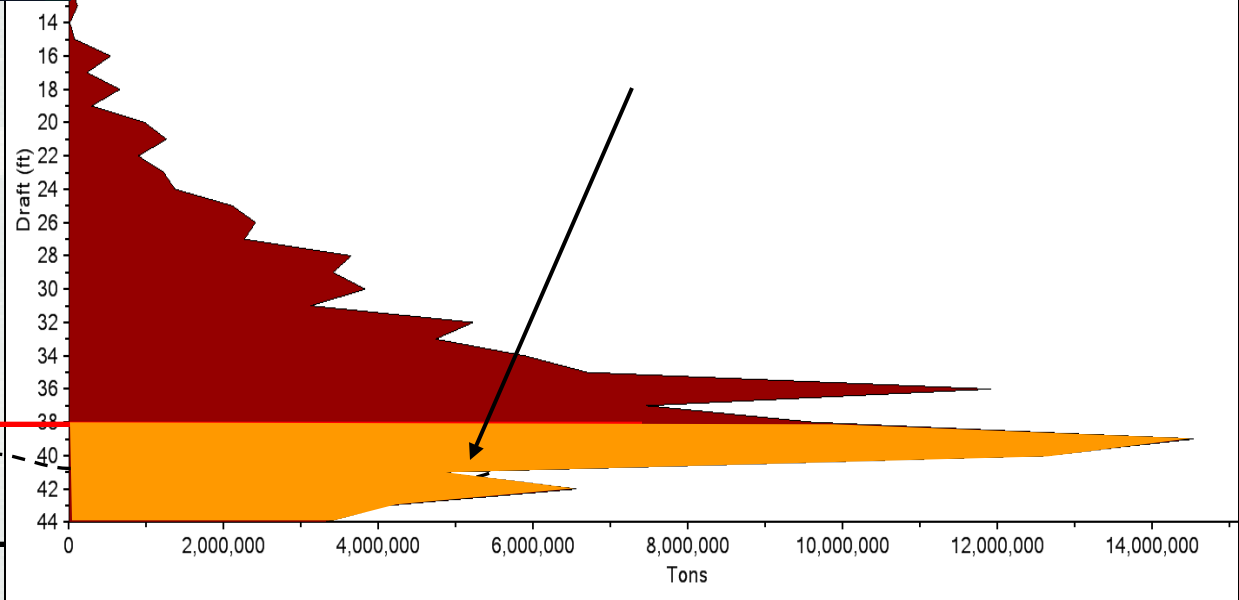
For more information, please be directed to Dr. Ned Mitchell at kenneth.n.mitchell@usace.army.mil.

level of prioritization you would like to see.

Depth-Utilization Analysis



CPT tabulates the historical rates of shoal-vulnerable tonnage transiting navigation channels and uses the respective quantities as a basis for prioritizing O&M dredging jobs.



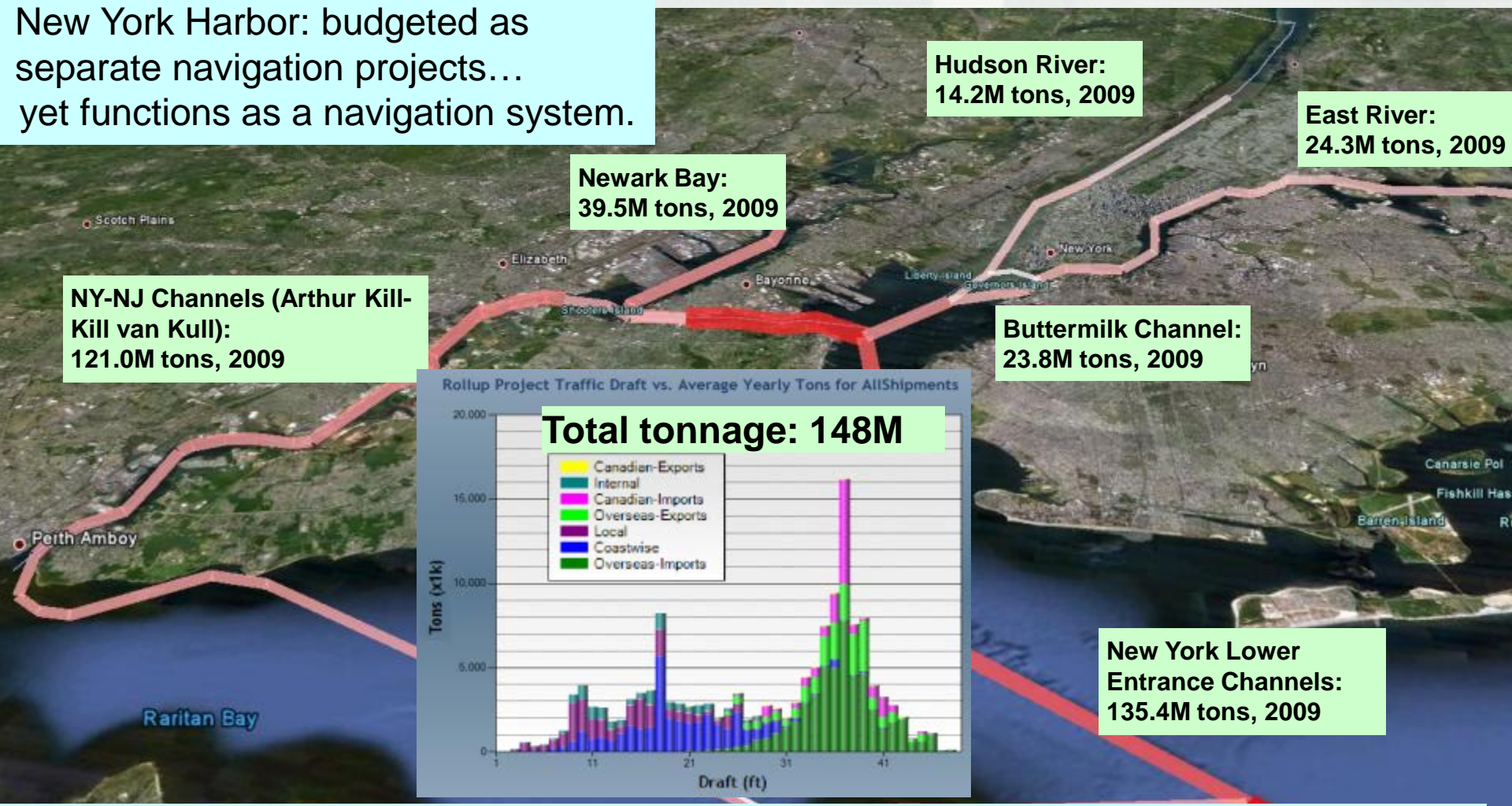
Visualization with CPT

WARNING This page contains commercially sensitive statistics pertaining to rivers, harbors, and waterways and must be held in strict confidence as required by 33 C.F.R. § 209.320. Unauthorized disclosure could result in loss of employment, fines, and imprisonment under 18 U.S.C. § 1905.



CPT and Navigation Systems

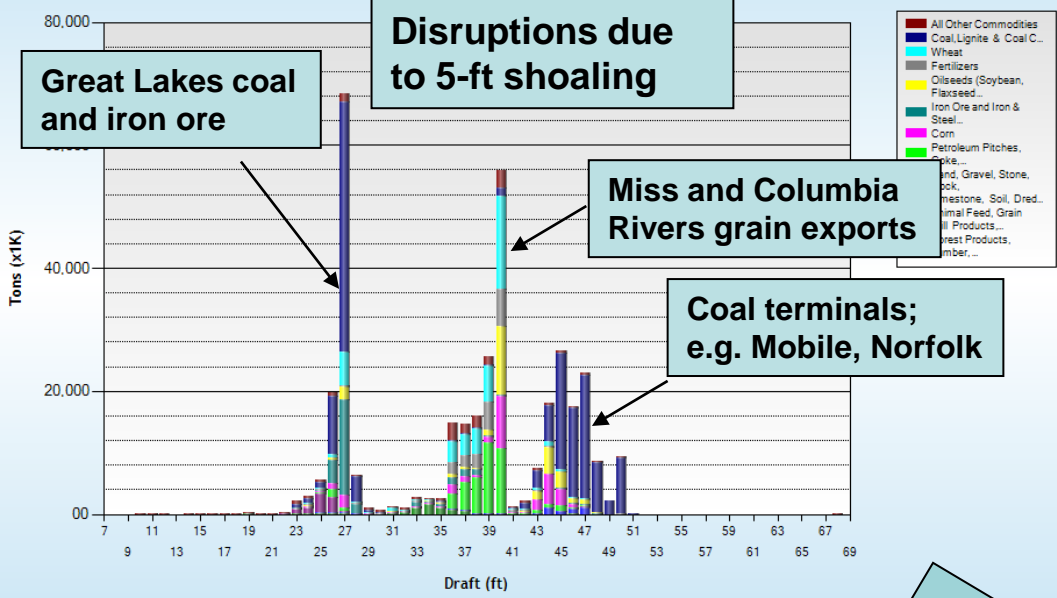
New York Harbor: budgeted as separate navigation projects... yet functions as a navigation system.



CPT is helping to ensure that Project O&M budgeting considers channel depth-utilization, cargo types, and system interdependencies (i.e. condition of other projects!).

Quantifying Impacts of Shoaling

Commodity Details Tons (Transit) for Rollup 2005-2008

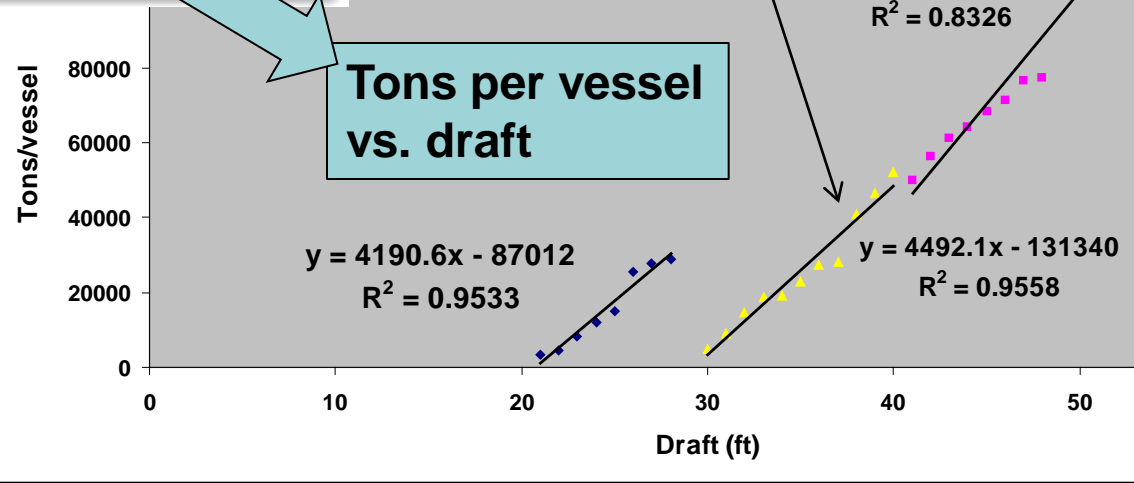


- Scalable approach for quickly estimating cargo that must be light-loaded due to shoaling conditions.

- Slopes of trend lines indicate the average amount of cargo that must be removed from each vessel in order to reduce vessel draft by 1-ft.

4,500 tons/vessel/ft of depth

- Approach can be extended to total annual cargo disruptions, number of required additional voyages, and ultimately increased shipping costs.



What is CSMART?

Web-based, Silverlight application that prioritizes coastal structures according to user-specified criteria and weightings on metrics such as condition rating, commercial tonnage, fish landings, and cruise and ferry passengers. Allows local, regional, and national queries and comparisons.

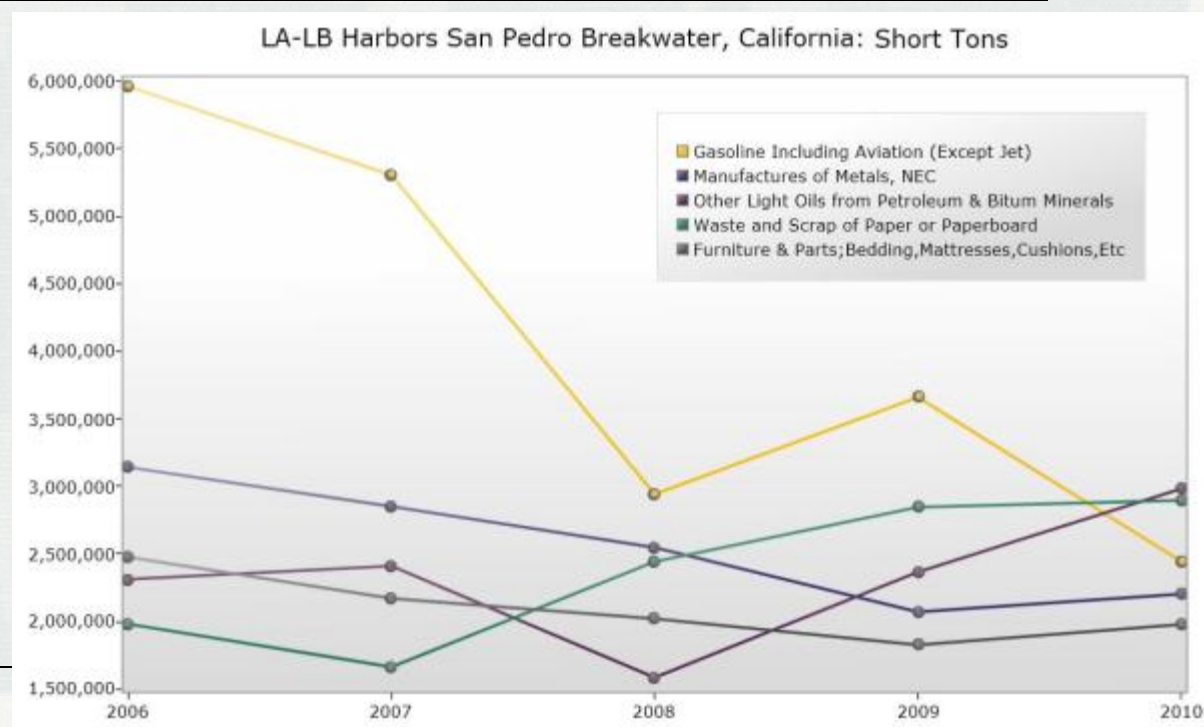
<https://itlgis01.usace.army.mil/CPT/Silverlight/CSMART>

Welcome Structures Features Results

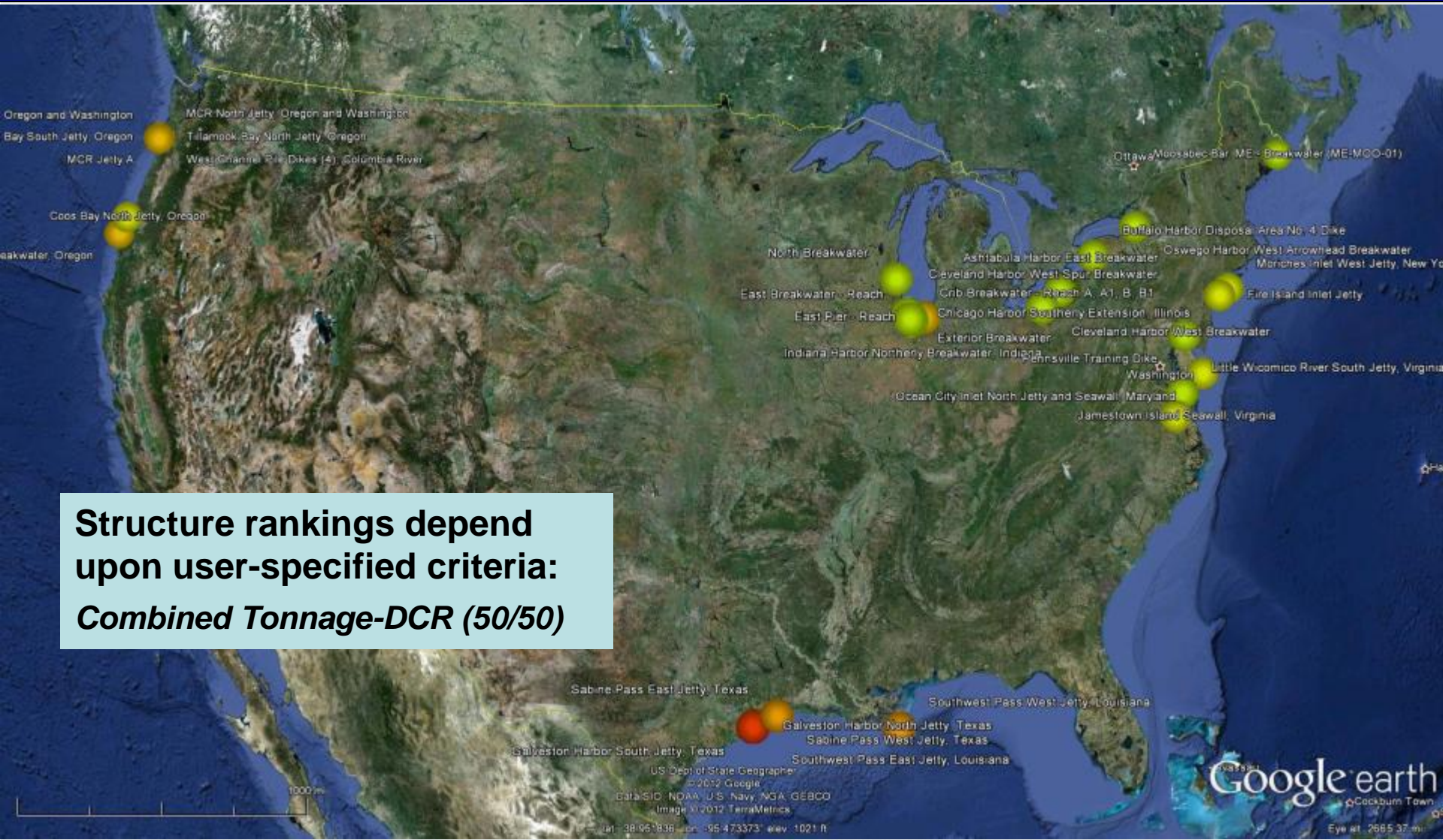
Commercial Tonnage Commercial Fishing

Binary Choices Physical Condition Rating

- Include Caretaker Status?
- Include National Security Designation?
- Include Public Transportation Function?
- Include Subsistence Harbor Status?
- Include Navigation Safety Function?
- Include Excursion Vessel Presence?
- Include Presence of Military Base and/or Vessels?
- Include Presence of Vessel Construction and/or Repair Facilities?
- Include Harbor of Refuge Status?
- Include only Harbor Maintenance Trust Fund Eligible Projects?

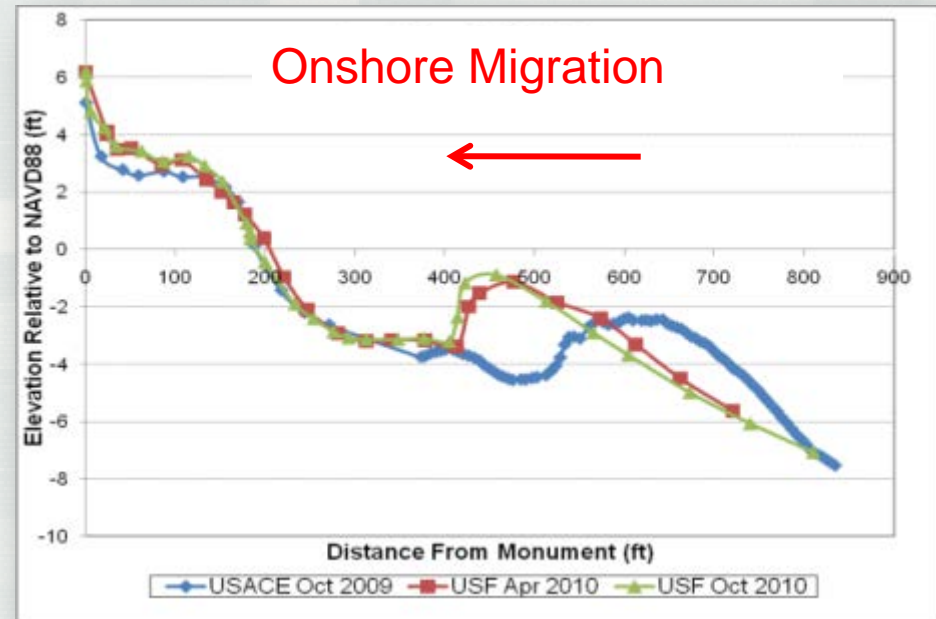


Structure Prioritization via CSMART



Questions

- **Placement Method:**
Pump vs. Hopper Dredge
- **Quantity and Rigor of Design:**
“Dumped” vs. Designed
- **Cross-shore Location:**
Feed sand vs. wave break
- **Alongshore Location:**
Relative to inlet; gaps required?
- **Environmental Concerns:**
Dispersion of fines over habitat



Statements of Need

Design and Evaluation Tool for Nearshore Berm Placement of Non-Beach Compatible Material
Tracking Number 2011-N-15

Nearshore Placement of Dredged Sediment Assessment
Tracking Number 2011-N-19

Tracking Number 2011-N-19
Nearshore Placement of Dredged Sediment Assessment

Ft. Myers Berm (Completed; Final Report Pending)

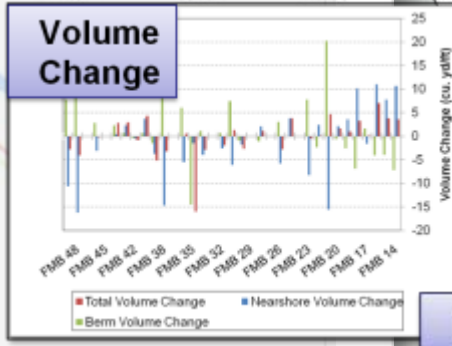
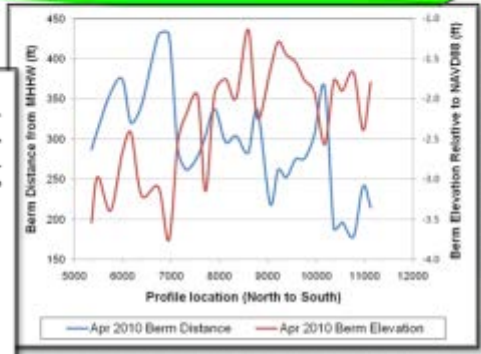
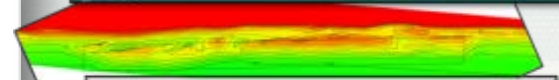
- Sediment dispersion
- Bathymetric change and berm migration rates

Pensacola Berm (In Monitoring Phase)

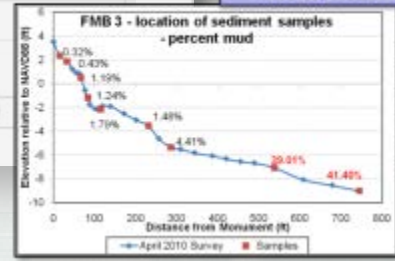
- Sediment dispersion
- Alongshore migration rates
- Pensacola channel infilling rates

Egmont Berm (In Monitoring Phase)

- Pre-project site characterization
- Post-placement evolution

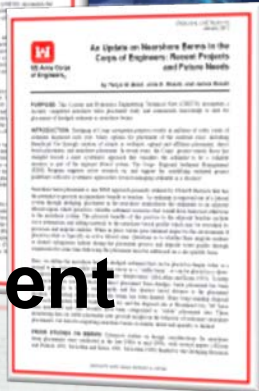


Migration of Fines



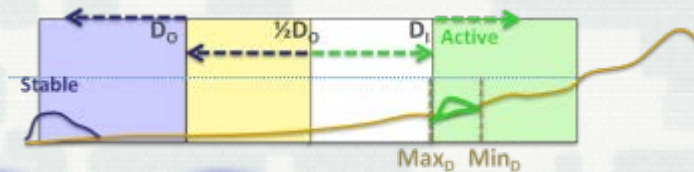
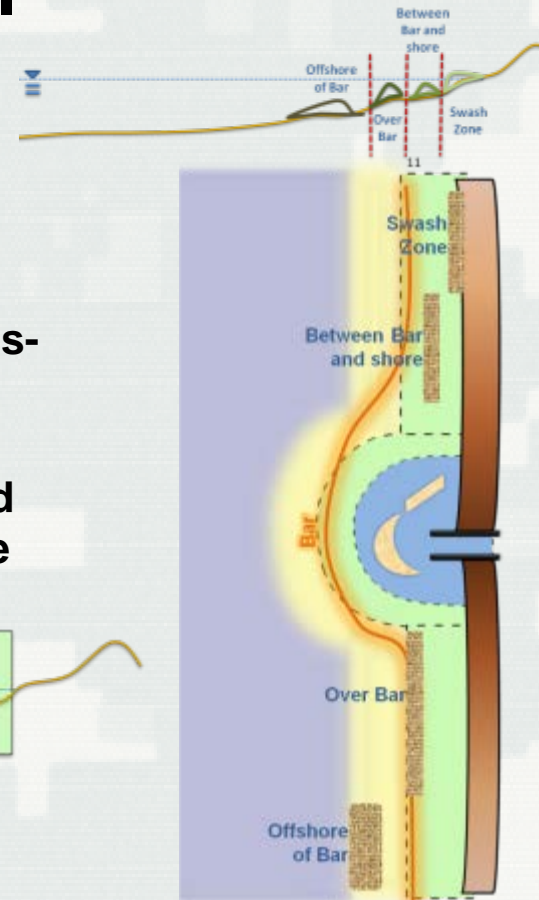
Action 3.2.2 of Navigation Strategic Vision
“Establish practices...optimize environmental windows...maximize beneficial use of O&M”

Berms Online: A Nearshore Berm Historical Database



Simple Planning Calculator Tool

- Developing flexible tools (rapid desk-top to detailed models) for design
- Dredged sediment size(s) and volume
- Placement position in cross-shore, and soon in alongshore
- Site processes represented through empirical formulae



Check out the
Berm Booth!

Guideline Development

CIRP Future



Advance R&D in models and tools

Link to existing data and databases

Produce accurate calculations with quantified goodness-of-fit

Roll up calculations to speed interpretation

Generate graphical and quantitative output for decision-support

Speed delivery of results to customers

Examples...

Channel Portfolio Tool (CPT), CPT Smart Phone App

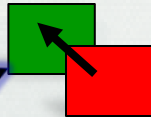


Models and Tools

GenCade

sink

Other Models and Tools



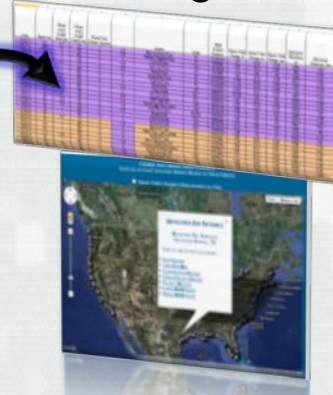
Please let us know if you have more ideas!

Models and Tools

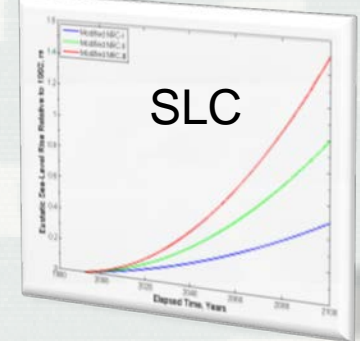


sink

Existing Data



GenCade +





- Decision-support guidance for rehab given damage rate & SLC
- Many federal structures 50+ years old
- Validate wave overtopping, transmission, and sand transport through rubblemound structures
- Rehabilitation multi-million \$
- Consider archived AIS vessel movement; is wave transmission through jetties creating navigation hazards?

Statements of Need

Improving Wave Calculations at Coastal and Estuarine Navigation Channels
Tracking Number 2009-N-5

Statements of Need

Automatic Identification System (AIS) data use in Navigation operations and engineering.
Tracking Number 2013-N-5

Action 3.2.3 of Navigation Strategic Vision
“Develop science & engineering risk-management approach...to nationally rank reliability of navigation projects”

Presently Addressing 5 SoNs:

Statements of Need

Need long-term morphologic evolution predictors
Tracking Number 2008-N-6

Statements of Need

Design and Evaluation Tool for Nearshore Berm Placement of Non-Beach Compatible Material
Tracking Number 2011-N-15

Nearshore Placement of Dredged Sediment Assessment
Tracking Number 2011-N-19

Statements of Need

Improved Justification for and Prioritization of Annual Maintenance Dredging Investments
Tracking Number 2009-N-8

Statements of Need

Dynamic Web-link and analysis of environmental Database for Coastal Inlet, Harbor, and Estuary Wave Modeling Projects
Tracking Number 2011-N-10

Propose Adding 4 More in FY13 (discuss Thu):

Statements of Need

Identifying and Addressing Potential Sea Level Change Impacts to Navigation Projects
Tracking Number 2013-N-11

Statements of Need

Automatic Identification System (AIS) data use in Navigation operations and engineering.
Tracking Number 2013-N-5

Statements of Need

Automated Feature Extraction for Sediment Budgets
Tracking Number 2013-N-15

Statements of Need

Improving Wave Calculations
Tracking Number 2009-N-5



Ned, Mary Beth, David, and baby John Mitchell