

COASTAL INLETS RESEARCH PROGRAM PROGRAM MANAGEMENT

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18 Apr 2024

WEBSITE:

[HTTPS://CIRP.USACE.ARMY.MIL/](https://cirp.usace.army.mil/)

COASTAL INLETS RESEARCH PROGRAM
FY23 IN PROGRESS REVIEW



U.S. ARMY



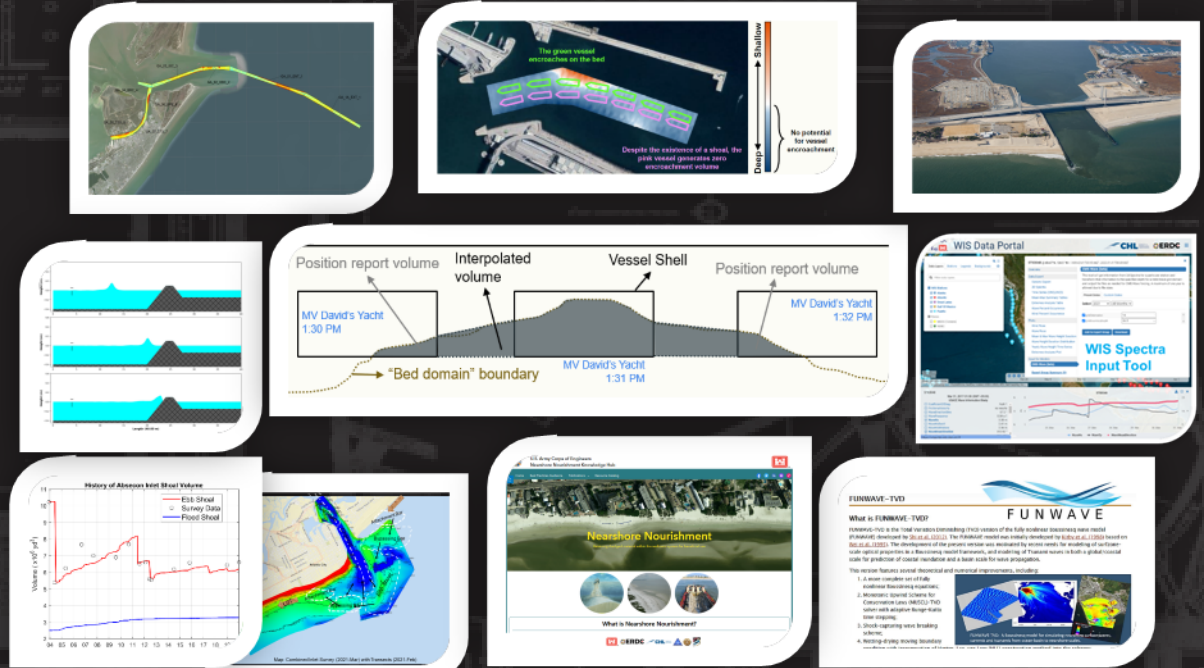
US Army Corps of Engineers



ERDC



CIRP



Work Units	Coastal Inlets Research Program											
	FY24				FY25				FY26			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Coastal Navigation Portfolio Management (CNPM)	Performance-based metrics for managing coastal structure portfolio tested				Application of coastal structure metrics to Division (Partners)				Publications, tech transfer, and continued product maintenance for CSAT			
	Research into the optimization of navigation entrance channel and coastal structure performance and maintenance and development of portfolio-scale tools. Existing SoNs: NAV-19-1332 (AIS); NAV-21-1671 (CSAT) New Start SoN: NAV/FRM-23-1969 (CSAT sed budgets)											
	Field applications of 2D CMS-Aeolis Dune Designs (Partners TBD - possible: NAP, SWG)				Field application of 2D CMS-SAV Berm Design (Partners TBD)				Field applications of 2D CMS-Aeolis Dune CSRM Breach Designs (NWD Partners TBD)			
Coastal Modeling System (CMS)	Research into coastal nearshore processes and development of numerical model predictive capabilities for coastal sediment transport and morphology change with a focus on BUDM and NNBFs (e.g., nearshore berms, coastal dunes, and SAV shoals). Existing SoN: NAV-21-1538 (Nearshore Proc R&D) New Start SoNs: NAV/FRM/ENV-23-1859, 1970 (Coastal NNB/FRM/BUDM Modeling)											
	Guide for standard practice field				Numerical-physical model				Prototype InletGIS webapp (2.0)			
Inlet Geomorphic Evolution (IGEOM)	Publication completed for InletGIS metrics and geomorphons testing application											
	Initiate Inlet Shoal Remote Sensing method testing (NAP, SAM, and SAJ testing)											
	Initiate portfolio-scale InletGIS analyses											
	Research into broad temporal and spatial coastal morphodynamics to improve planning-level predictive capabilities. Existing SoNs: NAV-23-1829 (Nav Tools Updates); NAV-22-1657; NAV/ENV/FRM-20-1528, 1529 (Sed DB - Citizen Scientist) New Starts SoN: NAV-23-1923 (Improving Prediction and O&M Strategies via Remote Sensing)											
Inlet Engineering Tools (IET)	Publications and workshop Tech Transfer GenCade/CMS for CSRM/NAV Completed				Complete testing of new deep-water wave formulation for FUNWAVE-TVD (Udel Partner)				Complete publication and tech-transfer of FUNWAVE-TVD Deep-water Wave Model updates			
	Development and enhancement of coastal and navigation tools and predictive models for coastal inlet applications. Existing SoNs: NAV-21-1664, 1694, 1687 (FUNWAVE-TVD GUI, Guidance, and Development); FRM/NAV/ENV-22-1846 (GenCade LT Regional Model); FRM/NAV/ENV-21-1731											
	Complete publication and tech-transfer of FUNWAVE-TVD GUI and guidance											
	New Starts SoNs: NAV-23-1968, 1969 (Improve sed mgmt tools); FRM/NAV-23-1987 (Hindcasting coastal rubble mound reliability)				Beta testing of sediment management				Field applications of			
	New work units based on high ranking Navigation SoNs.											



CW TACTICAL R&D FOR COASTAL NAVIGATION



- The CIRP develops technologies to reduce coastal navigation channel dredging requirements, incrementally increase engineering performance in coastal design, and optimize O&M portfolio management. This includes technologies that predict the evolution of dredged sediment placement (BUDM), shoreline change, dune erosion, and other NNBF performance metrics directly support the reduction of risk to Navigation systems performance.
- Annual funding supports continued 2-3 year research projects plus new starts selected following RARG ranking and proposal selection process.
- Annual maintained products include the Coastal Modeling System (CMS), GenCade, and FUNWAVE-TVD models (SET-supported); Sediment Budget Analysis System (SBAS), Corps Shoaling Analysis System (CSAT), Sediment Mobility Tool (SMT), SandSnap, Satellite Shoreline Mapper (SSM), and more.

FY23 Tracking...		FY24 New Starts	SoN #	SoN name	PreProposal #	Title
1970 - Multi-scale analyses of BUDM impacts on long-term navigation channel maintenance		1970	Multi-scale analyses of BUDM impacts on long-term navigation channel maintenance	A18	Multi-Scale Modeling Approach to Surf and Swash Zone Processes	
To include BU alternatives: 1906 – Nearshore Berms/1921 – Eel Grass Habitat/1933 – Wetland Creation		1923	Improving Prediction and O&M Strategies	A11/A21	Remote Sensing of Hazardous Shoals	
1923 - Improving Prediction and O&M Strategies		1968	New volume-change tools to improve sediment management	A9	Next-Generation Volume Change Tools	
1968 - New volume-change tools to improve sediment management		1969	Incorporating shoaling rates into sediment budget creation to improve sediment management	A19	Automating Inputs and Improving the User Experience for the Sediment Budget Analysis System	
1969 - Incorporating shoaling rates into sediment budget creation to improve sediment management		1987	Hindcasting Coastal Rubble Mound Reliability	A55	Coastal Rubble Mound Design Equations and Safety Levels	
1987 - Hindcasting Coastal Rubble Mound Reliability		1970	Multi-scale analyses of BUDM impacts on long-term navigation channel maintenance	A17	CMS Veg for BUDM (ENV/NAV*)	

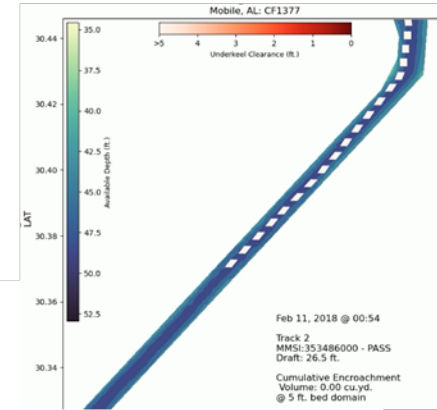


Coastal Inlets Research Program FY23 In-Progress Review

Thursday-Friday, 18-19 April 2024
08:15-11:50AM (Times in CDT)

CHL Conf. Rm. 200 | <https://usace1.webex.com/meet/CIRP>

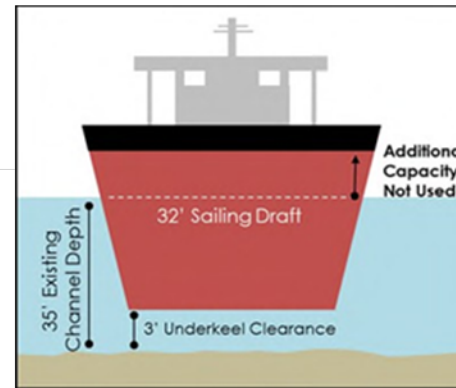
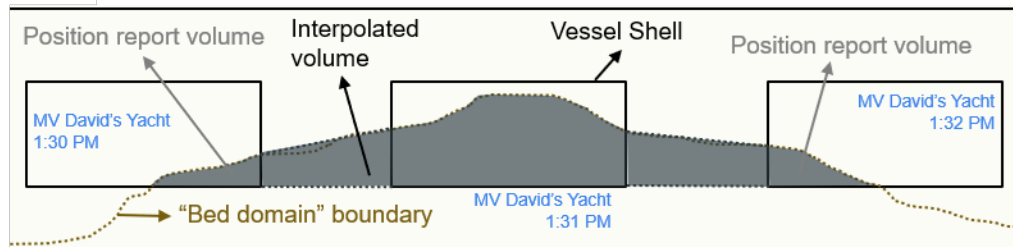
Coastal Navigation Portfolio Management



Decision Support to Marine Transportation and Dredging Systems

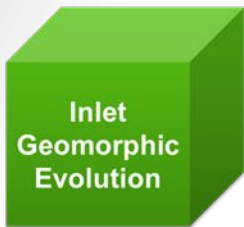
- 08:45-09:00 Portfolio -scale Vessel Analyses: Applications of Underkeel Clearance in Navigation Channels [Final Year]
- 09:00-09:15 Channel Shoaling and Analysis (CSAT) Advancements
- 09:15-09:30 Discussion
- 09:30-09:45 **BREAK**

Young/Scully
Hartman/Bain





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Tools to Support Natural and Nature-based Features

09:45-10:00 SandSnap: Digital Grain-size Imagery Analysis and Engaging Citizen Scientists [Final Year]

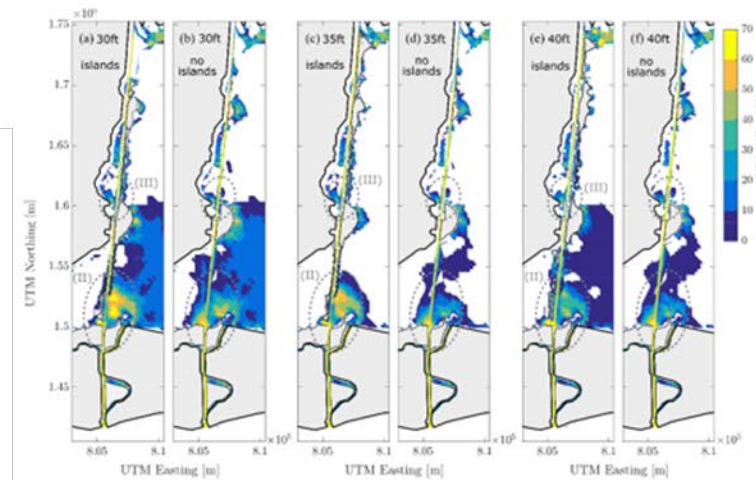
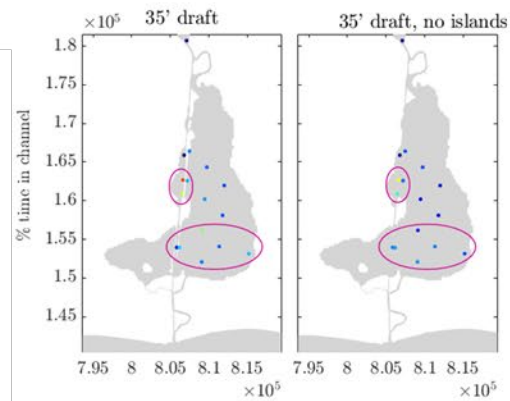
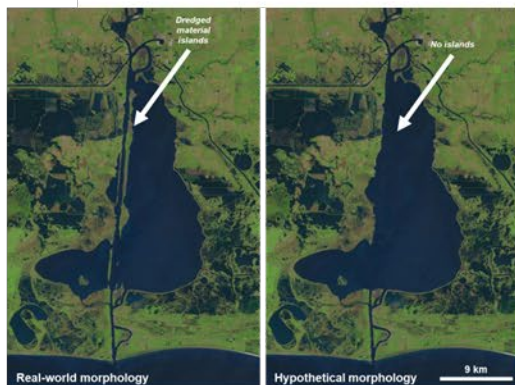
10:00-10:15 Impacts of Wetland Nourishment on Coastal Inlet Processes [Final Year]

10:15-10:30 Discussion

10:30-10:45 **BREAK**

McFall/Young

Krafft





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Inlet
Geomorphic
Evolution

Inlet
Engineering
Tools

10:45-11:00

Coastal Inlet Resilience in 3D Geomorphic GIS **New Start**

Shawler/Sylvester

11:00-11:15

Development of a Satellite-Based District Tool for Quantifying Coastal Evolution and Project Performance at Beaches [Final Year]

Conery/Brown

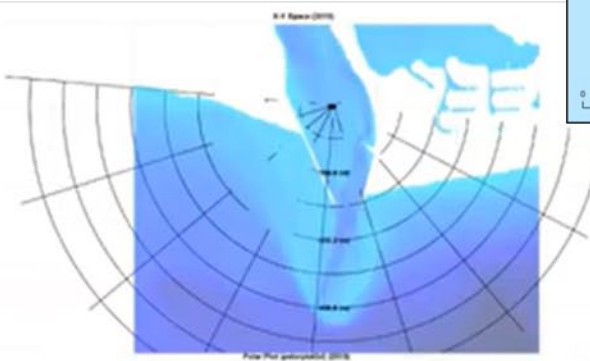
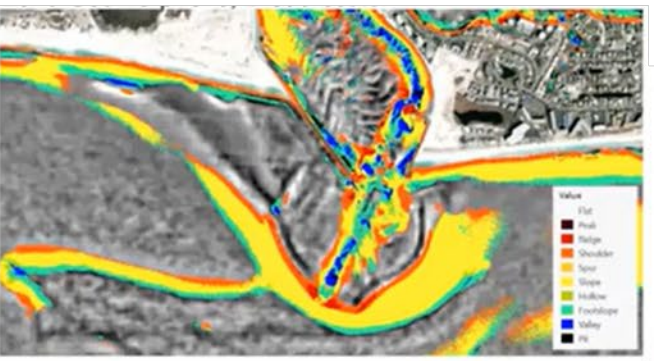
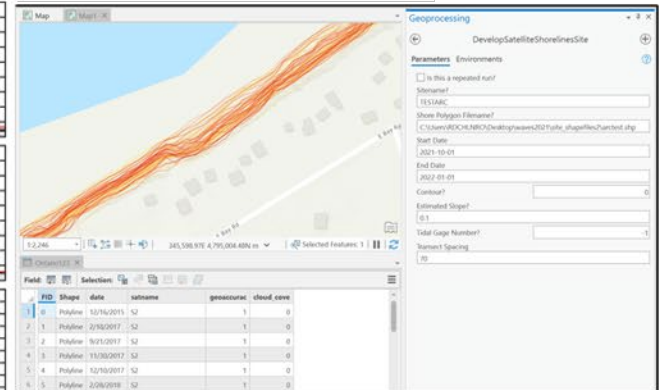
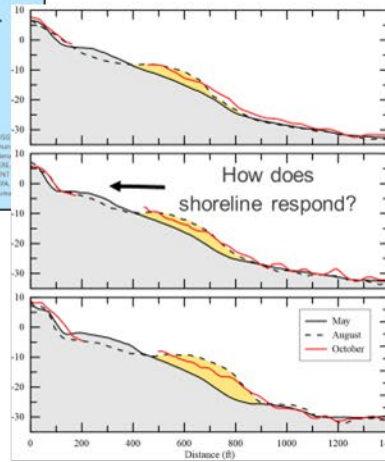
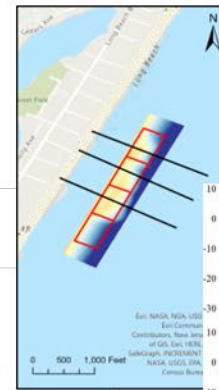
11:15-11:30

Discussion

11:30-11:40

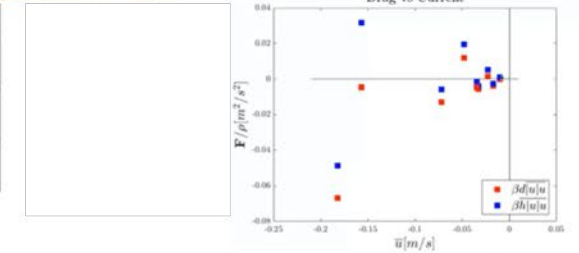
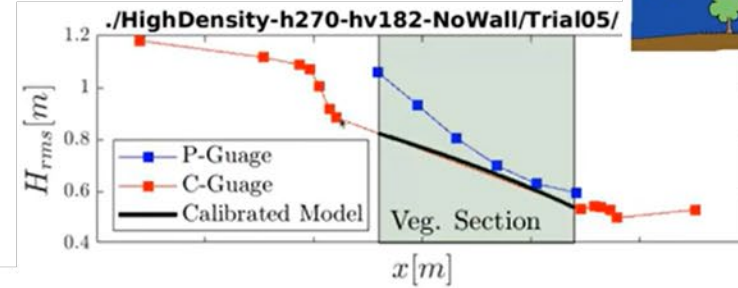
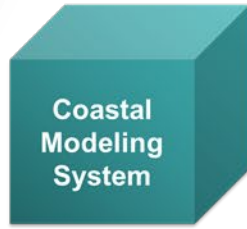
Wrap-Up Day 1

Tanya Beck





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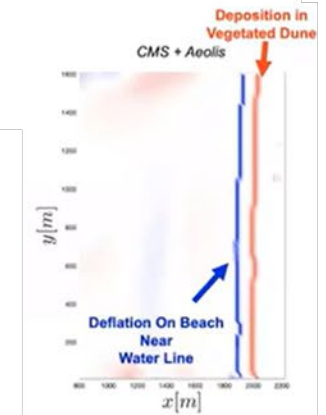
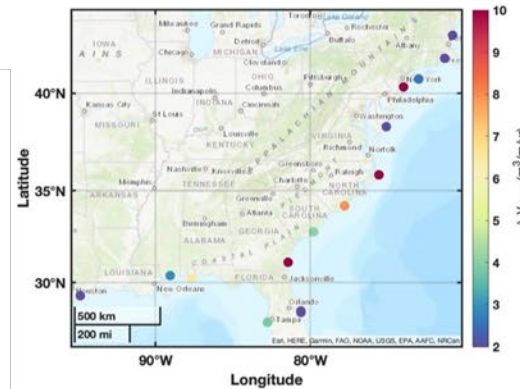
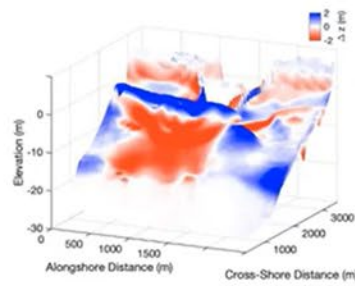
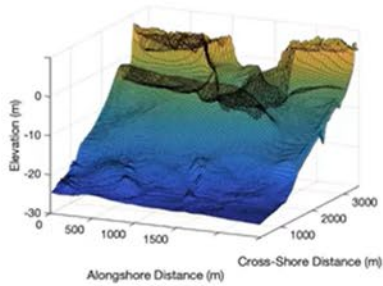
Nearshore Processes and Coastal Sediment Transport Model Advancement

- 08:30-08:55 CMS/C2Shore Model Development and Validation [Final Year]
- 08:55-09:15- Tools for Simulating Aeolian Sediment Transport and Coastal Foredune Evolution, Dune Response Tool, and Aeolis 1D/2D Development
- 09:15-09:30 Discussion
- 09:30-09:45 **BREAK**

$$F = \beta d \overline{|u|u} + \beta \eta \overline{|u|u}$$

Johnson/Holzenthal

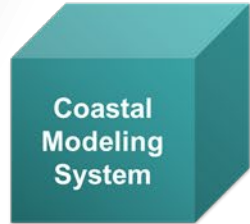
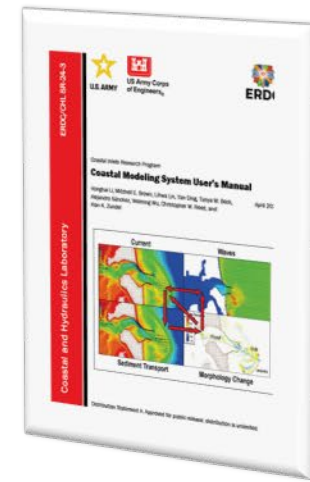
Cohn





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Coastal Inlets Research Program

CIRP Technology-Transfer Workshop
 CMS/GenCade Workshop
 USACE Los Angeles District,
 915 Wilshire Blvd, Ste 1101, Los Angeles, CA 90017
 12-16 June 2023

The Coastal Inlets Research Program (CIRP) conducted its 16th Technology Transfer Workshop from 12-16 June 2023. The workshop was held at the U.S. Army Corps of Engineers' Los Angeles District Area Office, located in Downtown LA.

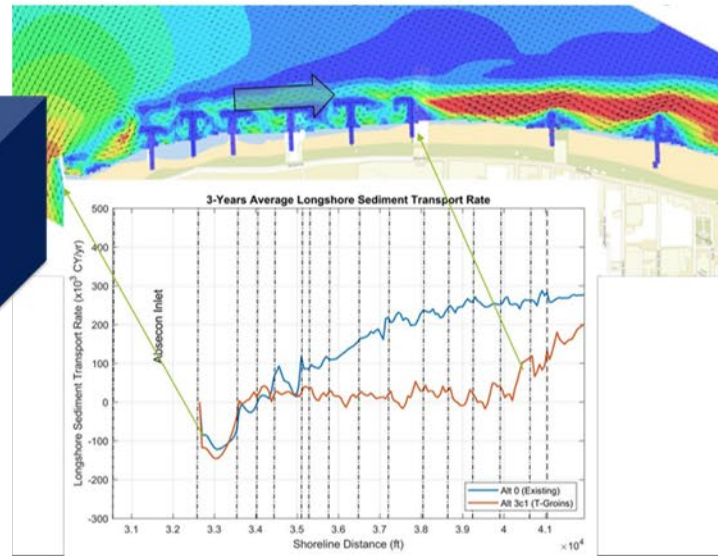
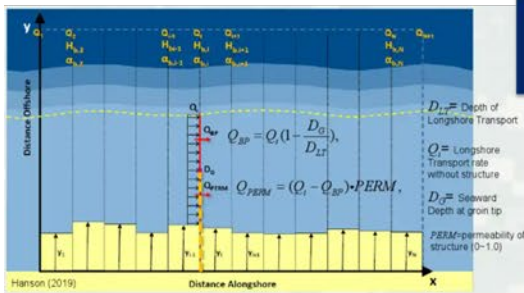
The focus of this workshop is on the **Surface-Water Modeling System (SMS) Version 13.2 Coastal Modeling System (CMS) Version 5.3** and **GenCade Version 1.1.8**.

A link to download Workshop Materials is provided [here](#). Presentation and other Documents are in the main folder. All relative data files are underneath the 'Workshop' folder.

Time	Mon, 12 June	Tue, 13 June	Wed, 14 June	Thu, 15 June	Fri, 16 June
		CMS (v5.3) Flow grid	CMS (v5.3) Steering	GenCade (v1.1.8)	CMS (v5.3) Advanced Topics



09:45-10:00	Management of CMS Development, Tech Transfer and Guidance	Brown/Holzenthal Ding
10:00-10:15	GenCade Development Updates	
10:15-10:30	Discussion	
10:30-10:45	BREAK	

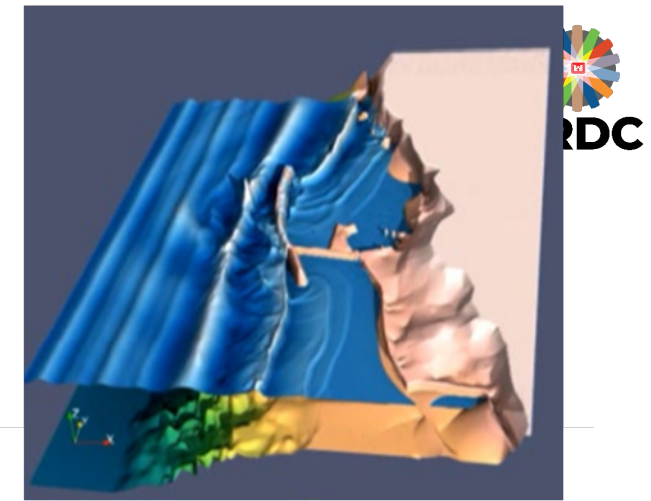


Coastal Erosion Protection Sediment Management Problems	CMS	GenCade
Long-term shoreline evolution	Limited	✓
Nearshore Placement	✓	—
Structures for Sediment Control	✓	✓
Navigation Sedimentation	✓	—
Long-term Effect of Beach fill	Limited	✓
Sand Bypassing on Shoreline Change	—	✓
Sand Back passing	—	✓

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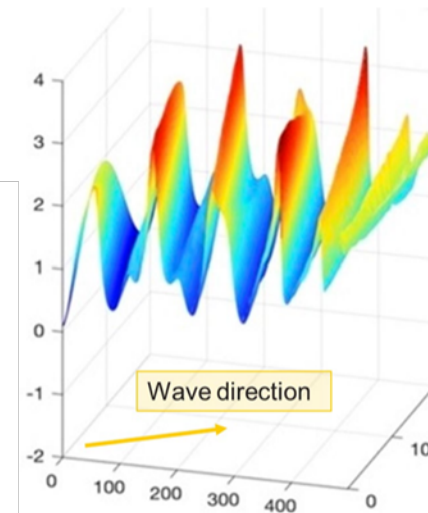
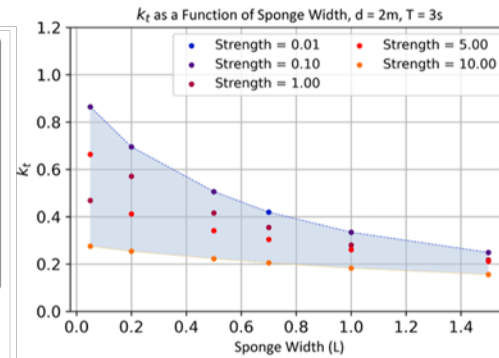
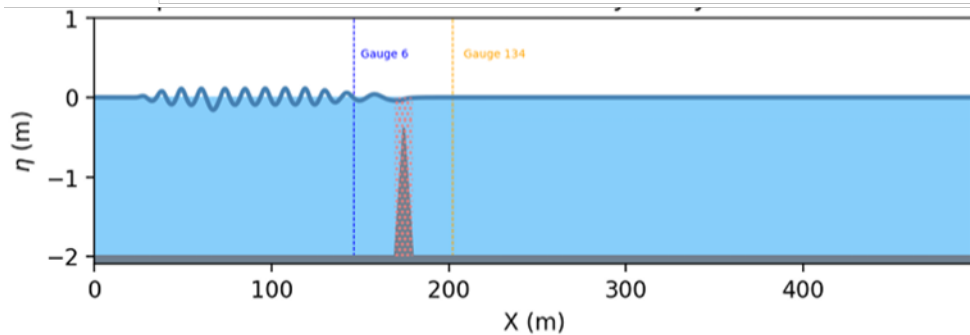


CIRP FY23 IPR AGENDA



Port and Nearshore Phase-resolved Wave Modeling

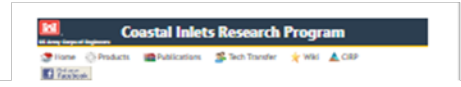
- 10:45-11:00 FUNWAVE-TVD Model Improvements Development Lam/Malej
- 11:00-11:15 Practical wave response guidance over emergent and submerged coastal structures using FUNWAVE-TVD Torres/Salgado-Dominguez
- 11:15-11:30 Discussion
- 11:30-11:40 Wrap-Up Day 2 / Closing Remarks Eddie Wiggins





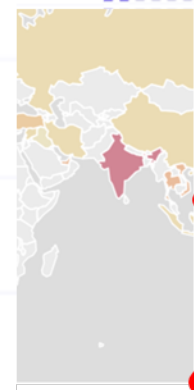
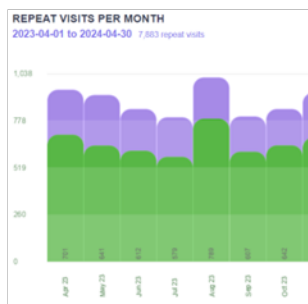
CIRP FY23 TECH TRANSFER

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TOP 20 ENTRANCE PAGES from April 2023 to April 2024

Entrance Pages	CMS	%
Main Page	CSAT	17.8%
CMS		12.5%
CSAT		10.4%
Depth of Closure	Depth of Closure	7.0%
GenCade		6.5%
Vessel Wake Prediction Tool	GenCade	5.1%
Surfacewater Modeling System		5.0%
Funwave	Vessel Wake Prediction Tool	4.0%
AISAP		3.6%
Citizen Science/Sand Snap	Surfacewater Modeling System	2.7%



HH&C CoP Preferred and Other Products

HH&C CoP Preferred	
Coastal Modeling System (CMS Flow and Wave)	GenCade
FUNWAVE	Particle Tracking Model (PTM)
Sediment Budget Analysis System (SBAS)	Surface-water Modeling System (SMS)
Other Products	
Aeolis	Inlet Reservoir Model (IRM)
Automatic Identification System Analysis Package (AISAP)	Map Portal
Bottom Boundary Layer Model (BBLM)	Marsh Transect Model (MTM)
Bouss2d	SandSnap
Coastal Model Test Bed (CMTB)	Satellite Shoreline Mapper (SSM)
Coastal Navigation Portfolio Mgmt (CNPM)	Sediment Budget Calculator (SBA)
Channel Portfolio Tool (CPT)	Sediment Mobility Tool (SMT)
Corps Shoaling Analysis Tool (CSAT)	Vessel Wake Portfolio Tool (VWPT)
Coastal Structures Management, Analysis, and Ranking Tool (CSMART)	WaveNet Functionality in WIS Portal
Depth of Closure	Berms Viewer
Dune Response Tool	Inlets Viewer

[Archive of Older Tools](#)

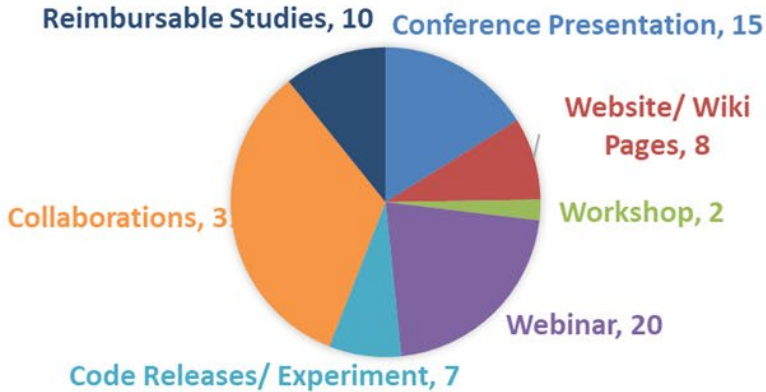
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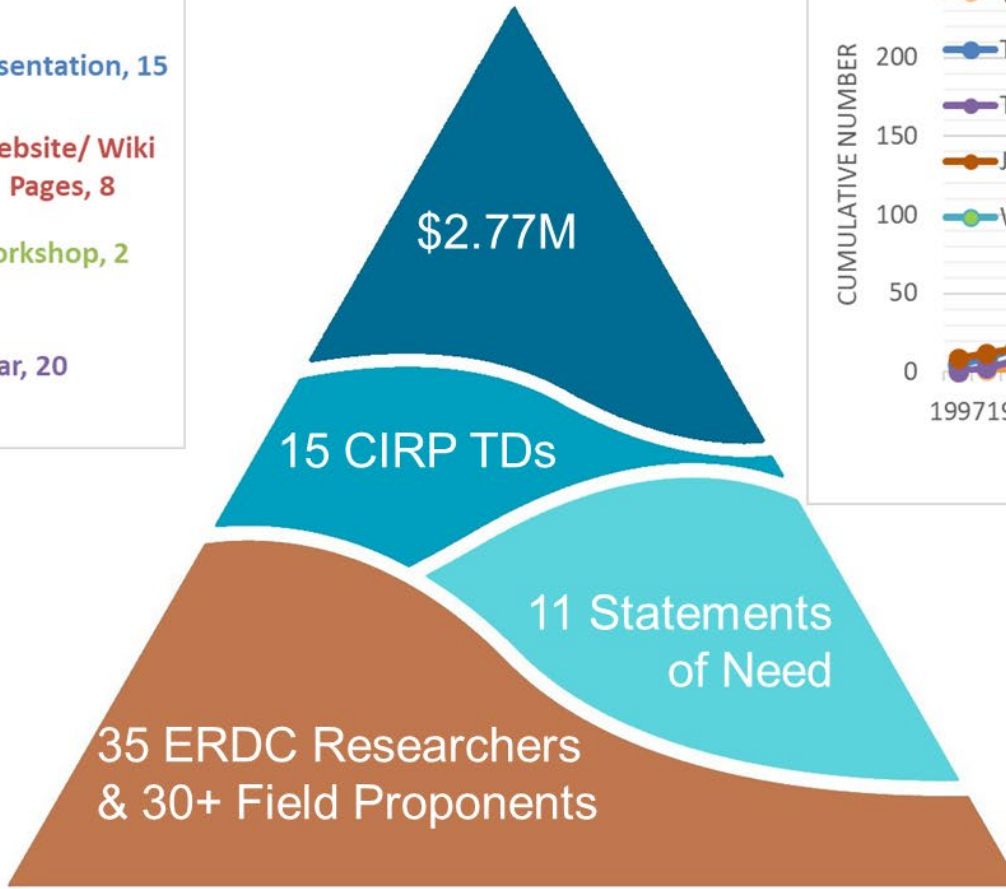
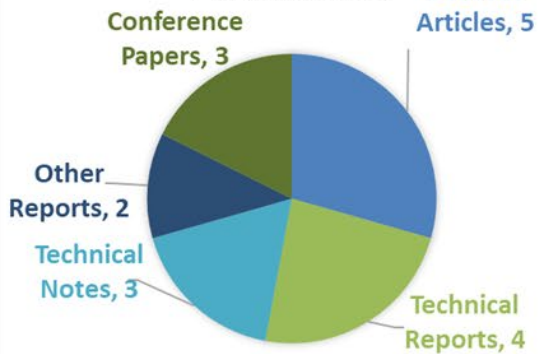
CIRP FY23 PROGRAM METRICS



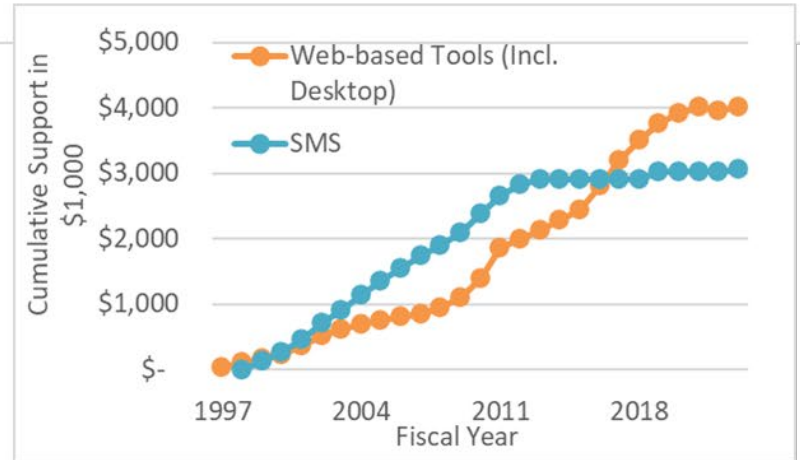
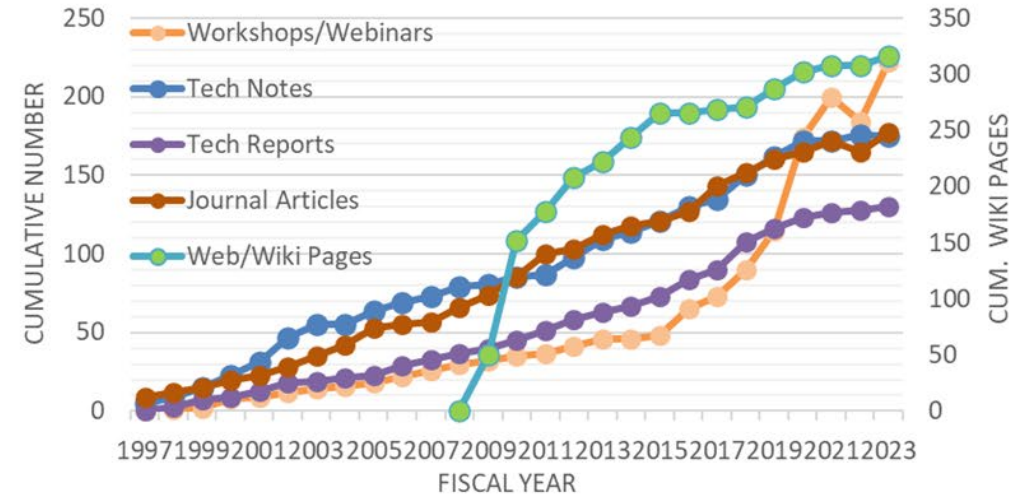
TECH TRANSFER



PUBLICATIONS



CIRP Publications and Workshops





LOOKING AHEAD TO FY24 & FY25



- **FUNCTIONAL TACTICAL CW R&D PROGRAM!**
 - Obligation: \$2.538 to be spent by 30-Sep (w/planned EXP \$1.2M in-house)
 - FY25 PBUD is 15 Projects consisting of 6 New Starts, 5 Existing Projects, and 4 wrap up Existing projects (minor funding for Pub/Tech Transfer)
 - \$2.3M (no new starts)
- **Technical Focus**
 - Sediment Transport Morphodynamic Model Advancement (CMS/AEOLIS/GENCADE)
 - NNBF/BUDM Applications
 - CHS Portfolio analysis of Coastal Structures (LRD 1ST)
 - Next Generation Sediment Budget Tech (SBAS/CSAT)
 - Coastal Inlet/Port Shoal Detection & Analysis Tools (INLET ATLAS)
 - FUNWAVE-TVD Dev Updates and Guidance for Structure Overtopping Wrap
- **Tech Transfer – CIRP Tech Discussion webinars and support internal and external workshops at all levels (Engineer, Divisions, Conferences)**
- **Mentoring (Torres) and growing CIRP teams [ORISE (2) FY23 → (9) FY24]**



QUESTIONS?