


CIRP
Research & Development

Coastal Inlets Research Program: Overview




COASTAL & HYDRAULICS LABORATORY
ERDC
Engineer Research and Development Center

Tanya Beck
Mitchell Brown

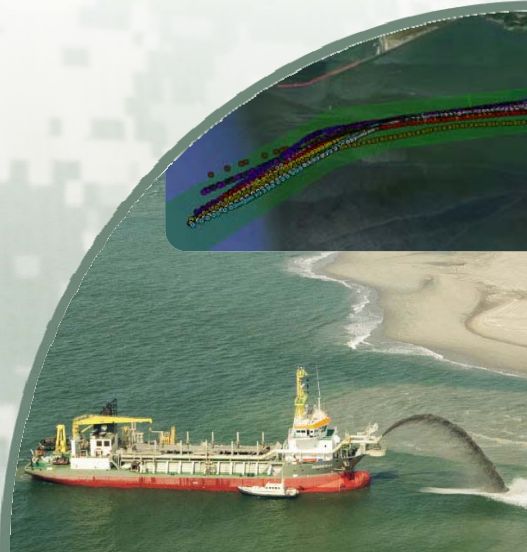
Rick Granados
HQ Navigation Business Line Manager

Jeff Lillycrop
Technical Director

Eddie Wiggins
Associate TD



US Army Corps of Engineers





CIRP

CIRP In Progress Review

AUDIO CONFERENCE ACCESS INFORMATION
Main Conference Room 200 - CHL, Vicksburg, MS
<https://usace.webex.com/usace/j.php?MTID=m5292bc8cf4c24c5791577680eff2e827>



COASTAL & HYDRAULICS LABORATORY
ERDC

08:00-08:15	Welcome	Jeff Lillycrop, Eddie Wiggins
08:15-08:45	CIRP Overview & Program Management	Tanya Beck, Mitch Brown
08:45-09:15	Coastal Navigation Portfolio Management	Brandan Scully, Lauren Dunkin
09:15-09:45	Inlet Geomorphology	Katie Brutsche, Brian McFall
09:45-10:00	BREAK	
10:00-10:30	Inlet Engineering Toolbox	Richard Styles, Kate Brodie
10:30-11:00	Waves at Navigation Structures	Lihwa Lin, Zeki Demirbilek
11:00-11:30	Coastal Modeling System	Honghai Li, Chris Massey
11:30-11:45	Wrap-Up / Closing Remarks	Jeff Lillycrop, Eddie Wiggins




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FY18 Tech Transfer Rollup (1 of 4)




University Collaborations - 21	NGO Collaborations - 3	Workshops/Webinars - 17
Jackson State University	Reed & Reed, Inc. (CMS)	Galveston CMS & GenCade Training (DOTS)
University of Hawaii	Moffatt & Nichol (CMS)	Jacksonville CMS Training (Sep 2018)
University of Wisconsin	ASBPA: Dune Management Challenges, Nearshore Processes Research (IETools, PM)	CWG Webinar on SedZLJ in CMS
UC Irvine		AISAP webinars – USCG Navigation Center and District 1 CPT webinar - SPN
UC Berkeley	University of Illinois	CSAT webinars – SAC, SAS, SWG, NAO, NAE
University South Florida	Florida Inst. Of Technology	CMS Webinars: NWP, NWS, SPL, POH, SWG, LRE, LRB
Stevens Inst. Of Technology	U.S Naval Academy	
University of Michigan	East Carolina University	
Texas A&M University	Oregon State University	
University of Mississippi	Clarkson University	
Interagency Collaborations - 3	UCSD-Scripps	
USGS - Long-term nearshore morphology change (PM, IETools, CMS, Waves)	Queens University	
EPA - Collaboration on fate of dredged material	Woods Hole Inst. Ocean.	
NRL -Nearshore Collaboration Effort	TU Delft	
	University of New S. Wales	




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FY18 Tech Transfer Rollup (2 of 4)




Conference Presentations - 21	
Probabilistic Shoreline Evolution modeling in Response to Sea Level Changes	EWRI 2018
Coastal Model Test Bed: An Exploration into Nearshore Numerical Modeling at the Field Res	ASBPA 2017
Nearshore Placement Behavior Elucidated Through a Sediment Tracer Field Study and Num	ASBPA 2017
Nearshore Placement Techniques in Southern Lake Michigan	ASBPA 2017
Wave and circulation numerical modeling for breakwater rehabilitation project at Tinian Harbor	ISOPE 2018
Coastal wave modeling for jetty rehabilitation at Coos Bay, Oregon	ICCE 2018
Numerical modeling of alternatives to reduce channel shoaling at Lynnhaven Inlet, Virginia Be	ICSE2018
High-resolution lidar scanning of developed and natural beach-dune systems on the Outer Ba	Ocean Sciences
Terrestrial Lidar Observations of Coastal Morphodynamics in Duck, NC,	Ocean Sciences
Observations of Dune Morphological Evolution in Duck, NC, Over Monthly and Decadal Time	ASBPA
High temporal Resolution Observations and Modeling of Dune Erosion in the Collision Regim	ASBPA
High-Resolution LIDAR Observations of Developed and Natural Beach-Dune Systems on the	ASBPA
Probabilistic Shoreline Evolution Modeling in Response to Sea Level Changes	ASCE-EWRI 2018
Probabilistic Modeling of Long-term Shoreline Changes in Response to Sea Level Rise and	ICES 2018
Integrated Coastal Process Modeling and Applications in Coasts and Estuaries	ASCE-EWRI 2018
Probabilistic Shoreline Change Modeling and Risk Estimation of Erosion	ICCE 2018
GenCade: Current Status and Future Work/ Presented	CWG Meeting 2017
Vessel wake prediction tool	CERF 2018
Modeling Sediment Pathways Around an Inlet	ICHE 2018
Interaction Between Waves, Current, and Morphology Change at Tillamook Inlet	ICEC 2018
Sediment Transport and Shoreline Response to Nearshore Placement of Dredged Sedimen	ICCE 2018




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FY18 Tech Transfer Rollup (3 of 4)




Journal Articles - 9	
Laboratory experiments on three-dimensional deformable granular landslides on planar and conical slopes. (Landslides - Springer)	McFall et al.
Use of numerical modeling and field data for harbor infrastructure modifications. (Book Chapter)	Demirbilek, Z., L. Lin, T.D. Smith
LiDAR and multi-spectral imaging investigations in Lake Superior: migrating tailings threaten Buffalo Reef. (Limnol. Oceanography)	Kerfoot et al., Limnology &
Interpolation method based on linear reg. and Monte Carlo simulation for hurricane storm surge vuln. of US HWY 90 along MS Gulf coastline. (Journal of Op. Ocean).	Bu et al.
Assessing Structure Sheltering via Statistical Analysis of AIS Data. (JWPCOE)	Young, D. & Scully, B., Mar
Sediment Tracer tracking and numerical Modeling at Coos Bay Inlet, Oregon. (JCR)	H. Li, T. M. Beck, H. R. Moritz, K.
A Simplified Physically-Based Model for Coastal Dike and Barrier Breaching by Overtopping Flow and Waves. (Coastal Engineering)	W. Wu and H. LI
Coastal Modeling. (Encyclopedia of Coastal Science)	H. Li
Spatially Variable Dune Erosion. (Submitted to JMSE)	Groth et al.





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5



FY18 Tech Transfer Rollup (4 of 4)



- Reimbursables – 15+

Testing, validating, advancing, and transferring CIRP products to Districts and Divisions

SAM – Vessel Wake datasets for validation

SAC/SAM – Validation datasets, test vessel extraction algorithm

SWG – Matagorda SC widening/deepening and PAs

- Corpus Christi Ship Channel to design placement areas
- CSAT analysis for DMMP for HSC, MSC & Corpus Christi
- Field support, measurements, sed analysis for GenCade

LRB – Buffalo Harbor, Modeling of Overtopping

LRC – Waukegan Harbor, Modeling entrance channel shoaling

- Burns Harbor/Ogden Dunes, Modeling nearshore placement

LRE – Wisconsin Pt: Estimate ship wake and wind waves



NWP – Coos Bay, OR, Channel and jetty rehab study

Asset Management – CPT and CSAT development (w/eHydro)

USCG District 1- AISAP support on Hudson River Study

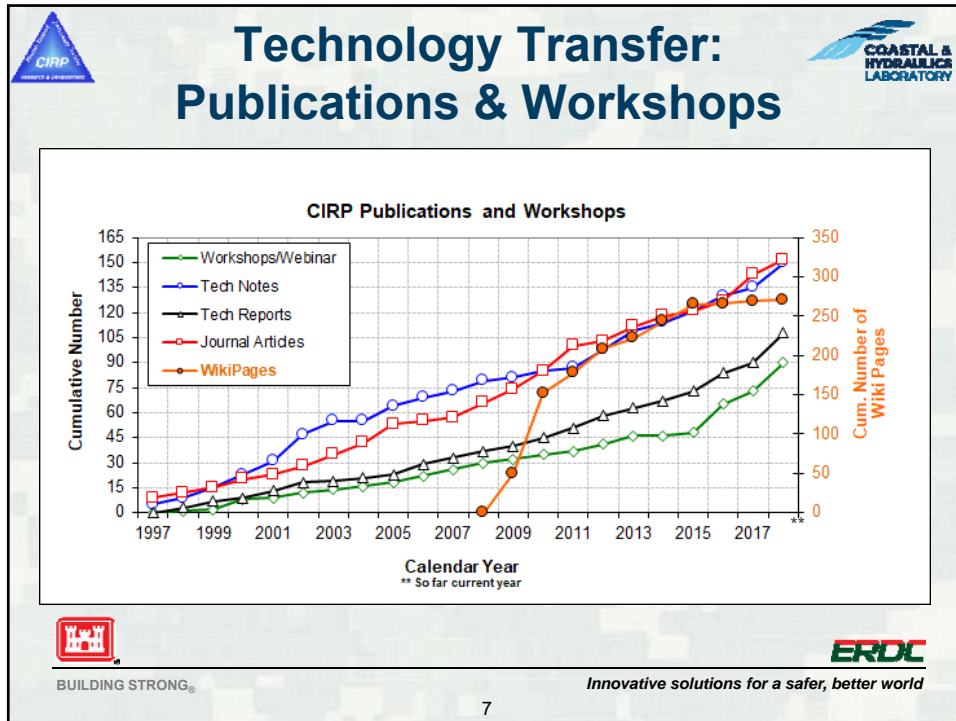
NAP – 20+ yrs validation data for GenCade (w/RSM)

USNA – Dunes validation data, testing, and lab facilities

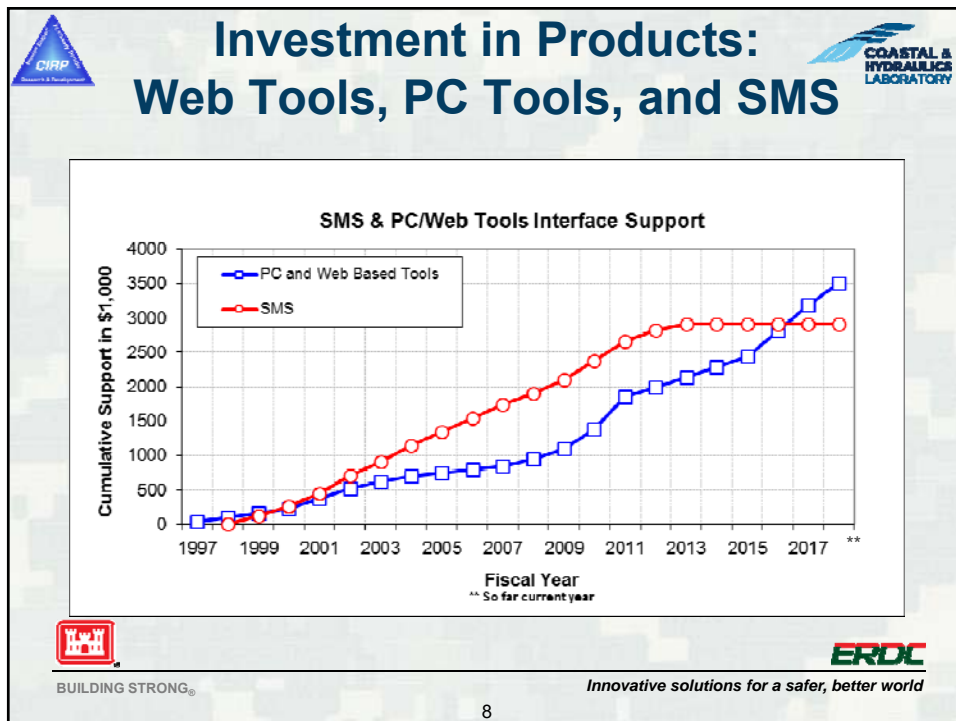



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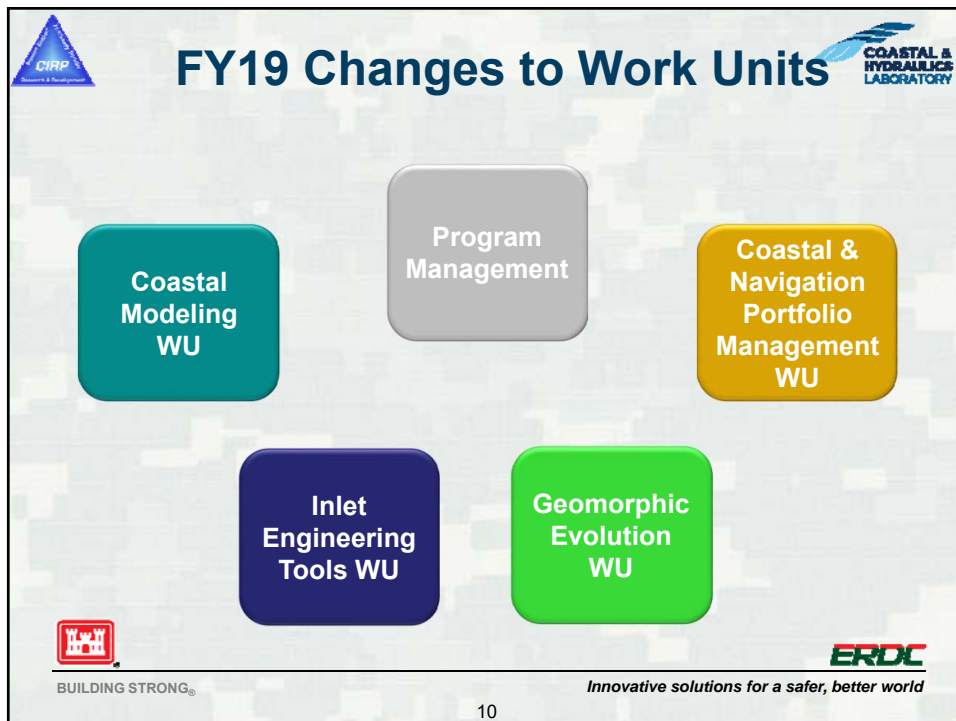
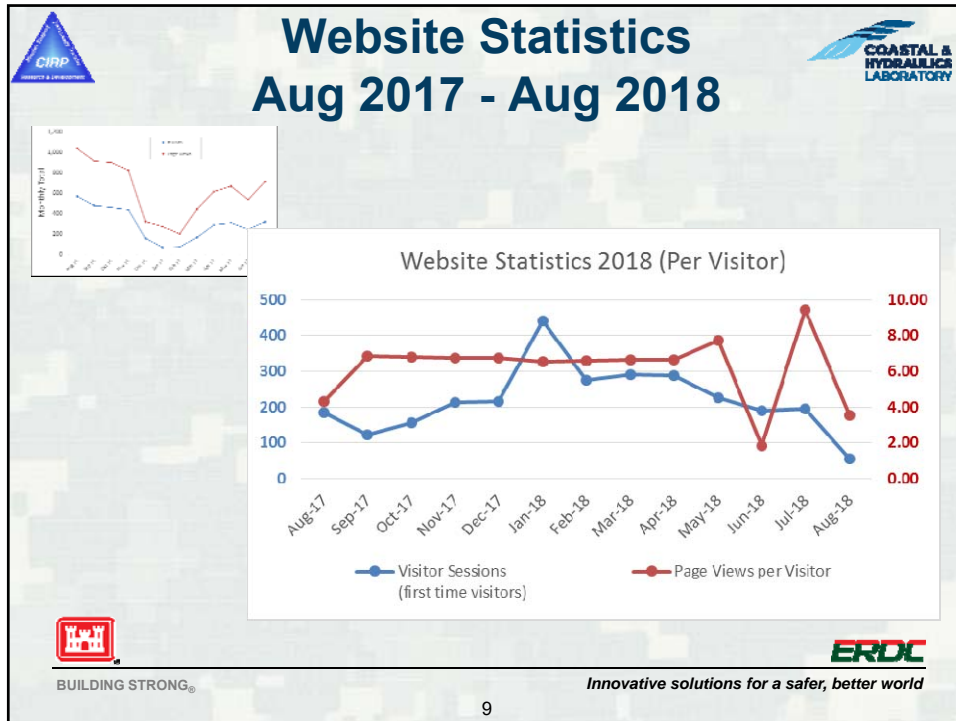
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7




8







FY19: SoNs and Proponents




- 23 proposals received: \$4.0 M, 50 researchers; FY19: \$2.7 M
- 15 SoNs Addressed
- PIs will collaborate with CWG/HH&C proponent

2015-N-15: National and local monitoring data	FY18 CWG Proponent
2015-N-34: Methods for safe two way traffic	
2015-N-38: AIS investigation of Dredge Behavior	
2015-N-40: Reducing the need for dredging	
2016-N-04: Wave/Current SedTran at Disposal Sites	
2016-N-10: CMS Swash/Surf Zone Sed Tran Proc.	
2016-N-14: LT modeling of coastal structure funct.	
2017-N-01: Test/Eval USACE coastal num. models	
2017-N-09: SL wave diss. due to vessel wake	
2017-N-52: CPT and AIS Development	
2017-N-67: Guidance for num. modeling mining	
2017-N-69: Cross-shore sediment sorting of NPs	
2017-N-70: Shoreline Response to NP Geometry	
2017-N-71: Modeling Effects of SLC at Tidal Inlets	
2017-N-72: Dune morpho. response over time-scales	


Weston Cross LRB
John Wethington LRC
Katherine Labuhn LRE
Monica Chasten NAP
Holly Carpenter SAC
Kevin Hodgens, Kelly Legault SAJ
Elizabeth Godsey SAM
Rob Thomas, Mohammad Islam SWG
Rod Moritz NWP
Jessica Podoski POH
John Winkelman HH&C
Dylan Davis SAD



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Proposed for FY19 Funding (1 of 2)




Work Unit	Title	Researcher(s)	FY19 Funding Request
Coastal Modeling System	Nearshore Processes (F&C/CODS/CIRP)	Johnson/Cohn	\$ 100,000
	Inlet and Nearshore Validation W/FRF Datasets	Johnson/Li	\$ 215,000
	Disaggregation of mixed sediment in near-bed transport	Smith	\$ 170,000
	CMTB & Optical Current Validation	Spicer	\$ 100,000
	CMS Tech Transfer	Li/Brown	\$ 114,000
	SMS GUI Development	Brown	\$ 293,310
	Sediment Mapping	Li	\$ 74,400
	SLR in CMS	Li	\$ 94,000
	2D Barrier Island Breaching	Li	\$ 42,400
	Modeling with Variable Winds	Lin/Demirbilek	\$ 150,000
	WaveNet & TideNet	Lin/Demirbilek	\$ 132,000
	CMS V&V (FY20 -> CMTB)	Lin/Demirbilek	\$ 40,000
	CEM Procedure for Waves and Structures	Lin/Demirbilek	\$ 130,000
	Mixed Sediment (SedZLI in CMS)	Li/Hayter	\$ 99,500
	CORSED (DOER/RSM/CIRP)	Gailani/Ding	\$ 60,000
		SUM	\$ 1,814,610



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Proposed for FY19 Funding (2 of 2)







<i>Inlet Engineering Toolbox</i>	Tools for Simulating Coastal Foredune Evolution Near Inlets	Brodie/Cohn	\$ 134,000
	Engineering tools to predict vessel wake induced channel erosion	Styles	\$ 175,000
	GenCade Model Improvements and Documentation	Styles	\$ 336,300
	Modeled Waves and Currents in Structures Design (e.g. ports)	Lin/Demirbilek	\$ 130,000
	SUM		\$ 775,300
<i>Inlet Geomorphic Evolution</i>	Nearshore Berms	Brustche/McFall	\$ 339,000
	Effect of inlet modifications on sediment retention by fringing marshes	Boyd/Ding	\$ 133,000
	Morphologic Modeling of Tidal Inlets	Styles	\$ 195,000
	SUM		\$ 667,000
<i>CNPM</i>	Coastal Navigation Portfolio Management	Dunkin/Scully	\$ 550,500
<i>Program Mngt</i>	CIRP Administration & Tech Transfer	Beck	\$ 250,000
TOTAL FY19 CIRP			\$ 4,057,410

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13

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- ## Conclusions - FY19 CIRP
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- Received 23 proposals addressing 15 SoNs
 - Technology Infusion Plans
 - Workshops/webinars – Connect Products to Navigation Portal
 - New initiatives support
 - ▶ Nearshore Coastal Processes R&D
 - CIRP R&D that supports US Nearshore Coastal Research Program
 - ▶ Numerical Modeling Transformation Strategy
 - CIRP Modeling that advances NMTS
 - ▶ Laboratory & Field Research – Leveraged Multiple Programs
 - FRF Nearshore Berm – Lab Vegetated Berms
 - ▶ R&D Direction in FY20 and Beyond
 - New SonS with CWG/HH&C
 - FY19 – each R&D WU/initiative:
 - ▶ CWG & HH&C proponents and discuss advances quarterly
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- 14