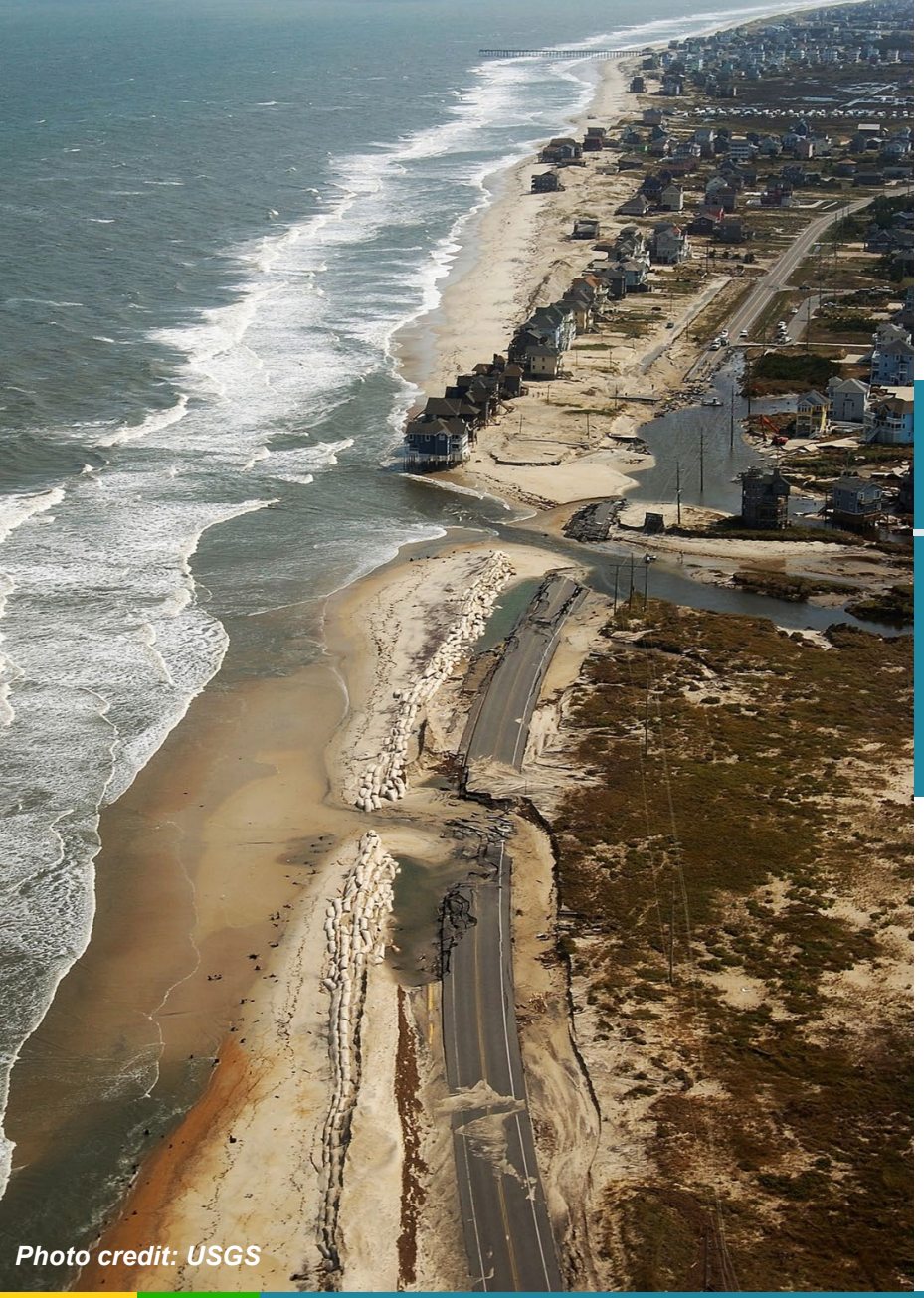
Photo credit: USGS

USCRP
US COASTAL RESEARCH PROGRAM

U.S. Coastal Research Program: Celebrating a Decade of Progress & Planning for the Next Decade

Jessie Straub
USCRP Managing Director

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

Board on Coastal Engineering Research
13 August 2024

UNCLASSIFIED

State of Nearshore Research: A Decade of Progress

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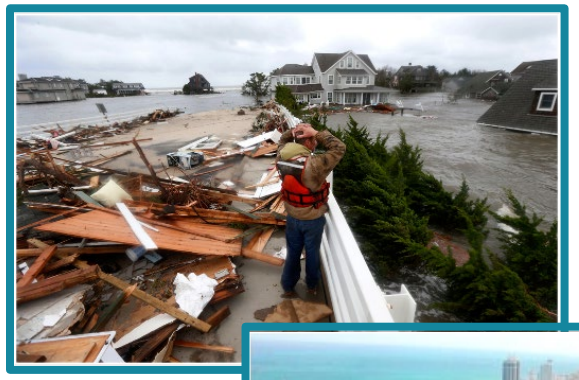
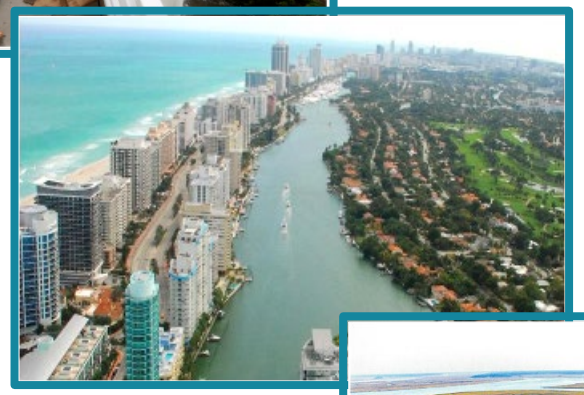
BCER initiative to develop and coordinate a National Science Plan addressing coastal research priorities of greatest relevance to coastal communities and rebuild a skilled U.S. coastal work force.



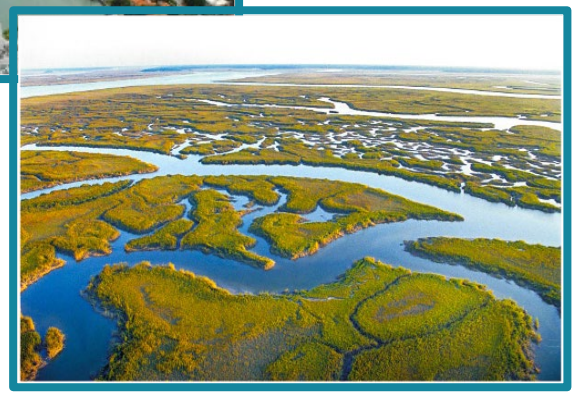
Extreme Events

Storm-induced flooding, coastal erosion, community impacts, natural recovery



Long-term Processes and Coastal Response

Sea level change, future storms, sediment supply, land use changes, human interventions



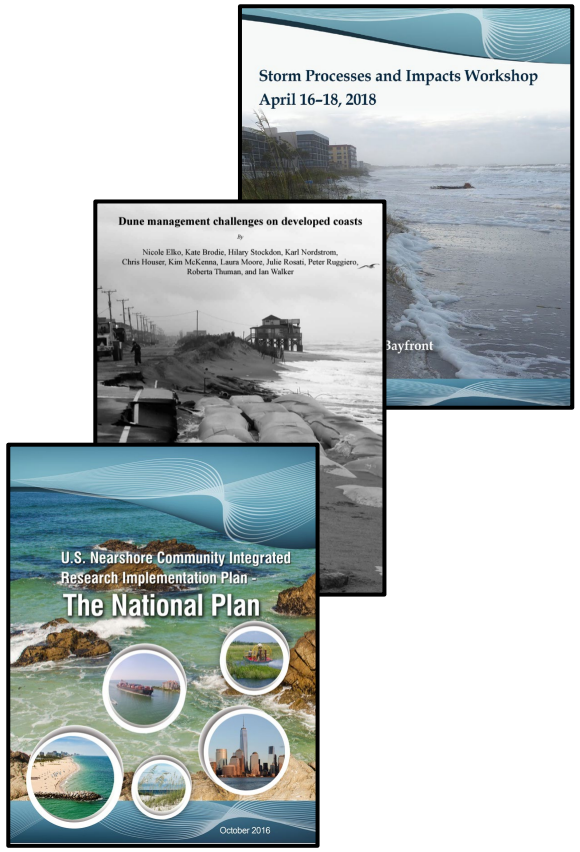
Biological, Chemical, and Physical Processes

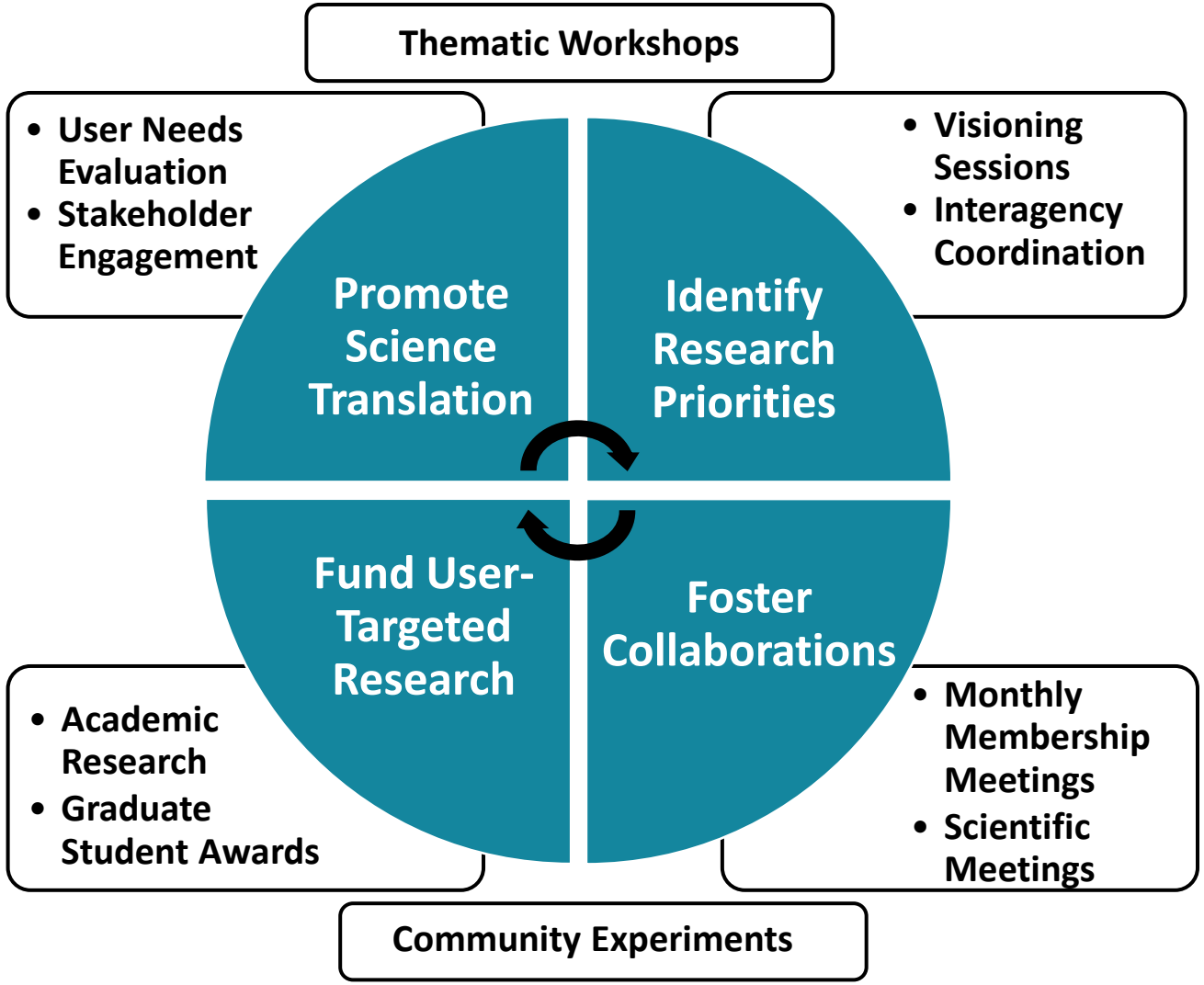
Impacting human and ecosystem health

2014 Future of Nearshore Processes Research

Objectives of the USCRP Community of Practice

A National coastal effort to coordinate Federal activities, strengthen academic programs, & address coastal community needs.

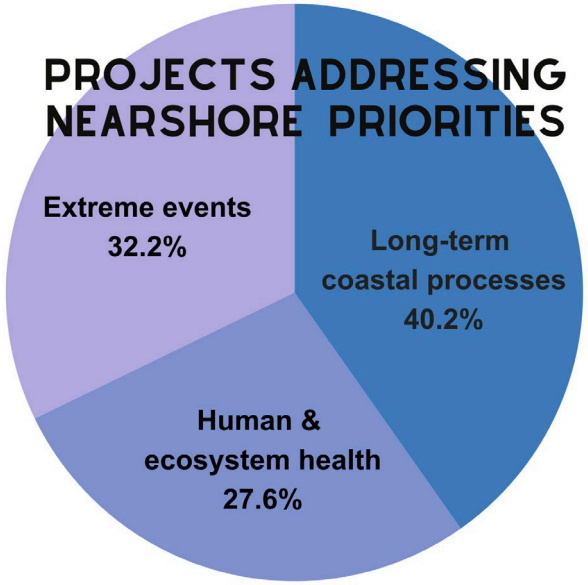


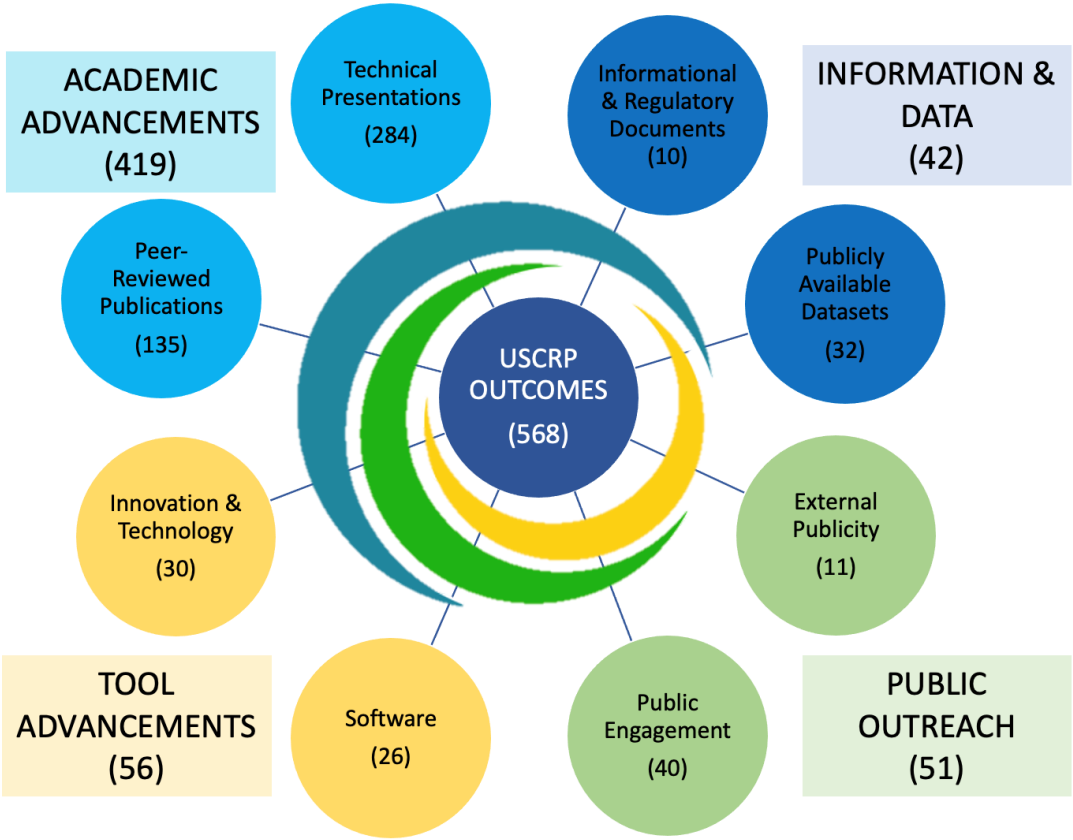


USCRP Overview (2016-2023)

"Coastal research needs in terms of data, knowledge and tools span multiple agencies, and exceed the capacity of individual agencies."

- 77 proposals funded across 28 states
- $23.5M awarded ($3-5M/year)





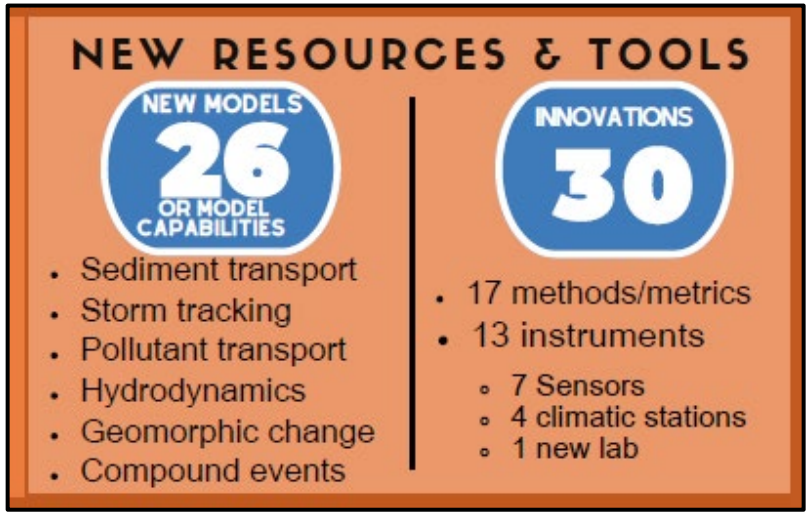
OUR PARTNERS

ONR · CSO · FEMA · U.S. Naval Research Laboratory · asbpa · US Army Corps of Engineers · USGS science for a changing world · BOEM Bureau of Ocean Energy Management · U.S.NRC · NASA · NOAA

USCRP USACE Impacts

Advancing Coastal Modeling

- **CSTORM-MS Improvements**
  - 70-90% runtime reduction
  - Improved simulation cost and accuracy



Fostering Collaborations

DUNEX
During Nearshore Event Experiment

DURING NEARSHORE EVENT EXPERIMENT (DUNEX)
Organized, executed, & partially funded large-scale field collaboration for predicting extreme coastal event impacts & processes

OVER 300 INSTRUMENTS DEPLOYED

SEDiment transport COllaborative LABoratory Experiment (SEDCOLAB)
- **Understand fundamental processes**
- **Improve numerical modeling**
- **Improve instrumentation**

Multi-team sediment transport study at ERDC-CHL

$2.5 MILLION invested in ERDC infrastructure

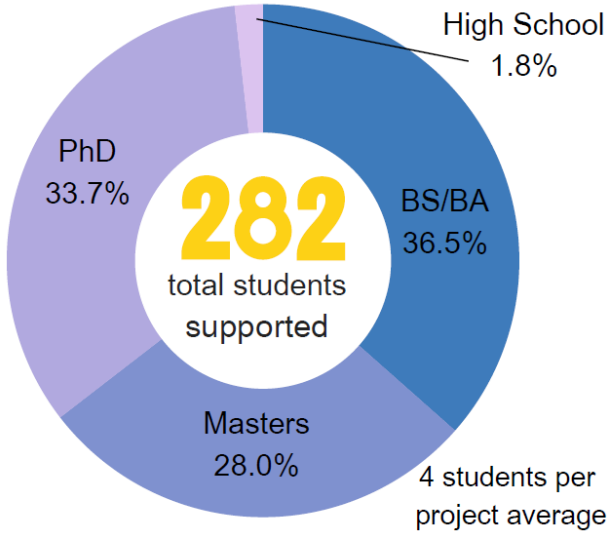
Targeted Research in R&D Priorities and Commander Challenges

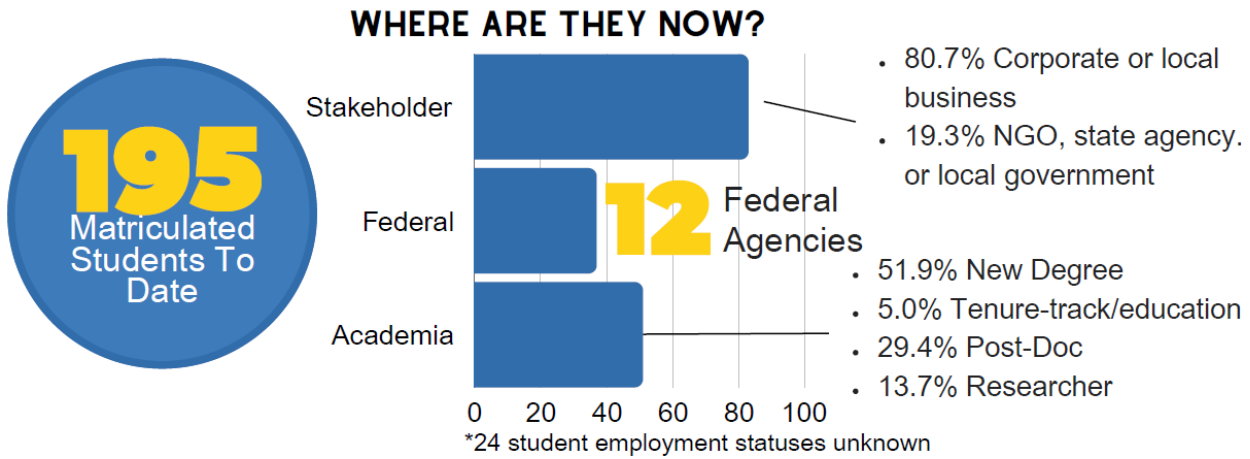
- **Compound Flooding**
  - Identifying dominant flood pathways/drivers
  - Coastal and riverine interactions
  - Impacts of groundwater discharge
- **Beneficial Use of Dredge Material**
  - Decision framework for evaluating thin-layer placement sites
  - Evaluating ecosystem services

SEDiment transport COllaborative LABoratory Experiment (SEDCOLAB)

- Multi academic team sediment transport research campaign hosted at ERDC-CHL
- **Objectives:**
  - ***Understanding fundamental processes of sediment transport***
  - ***Improving numerical modeling of sediment transport***
  - ***Improving instrumentation and advances in experimental techniques***

USCRP Workforce Development & Training Impacts





Developing the USACE Coastal Workforce

- 1 in 3 students work with a USACE employee as part of their USCRP R&D.
- 20% of graduated students have gone on to take Federal roles.
- 7 of 38 students entering government roles after graduating have joined USACE.

USCRP 2024 Decadal Visioning Workshop

Workshop Objective: *Bring together federal agencies, stakeholders, and academia with the goal of* ***identifying and prioritizing*** *key management* ***challenges*** *and* ***high priority science gaps*** *that will* ***guide*** *the next decade of* ***coastal research***.

Pre-Workshop Information Gathering

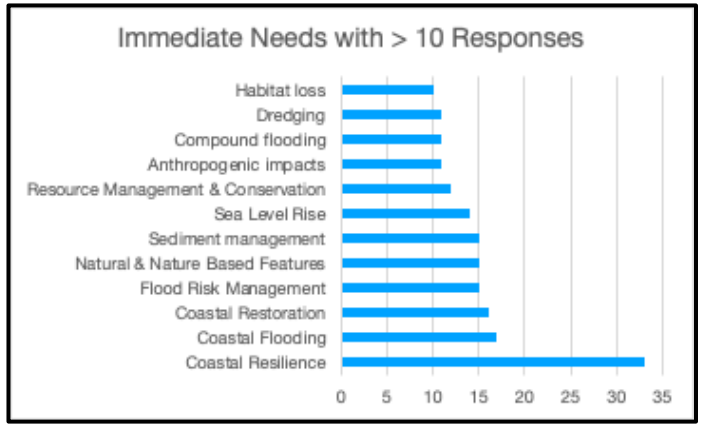
Federal Agency Partner Survey & Scoping Session

- Top immediate coastal research needs and technical challenges relate to **sediment transport** and **compound flooding.**
- Top long-term priority coastal topics relate to **flood risk reduction.**

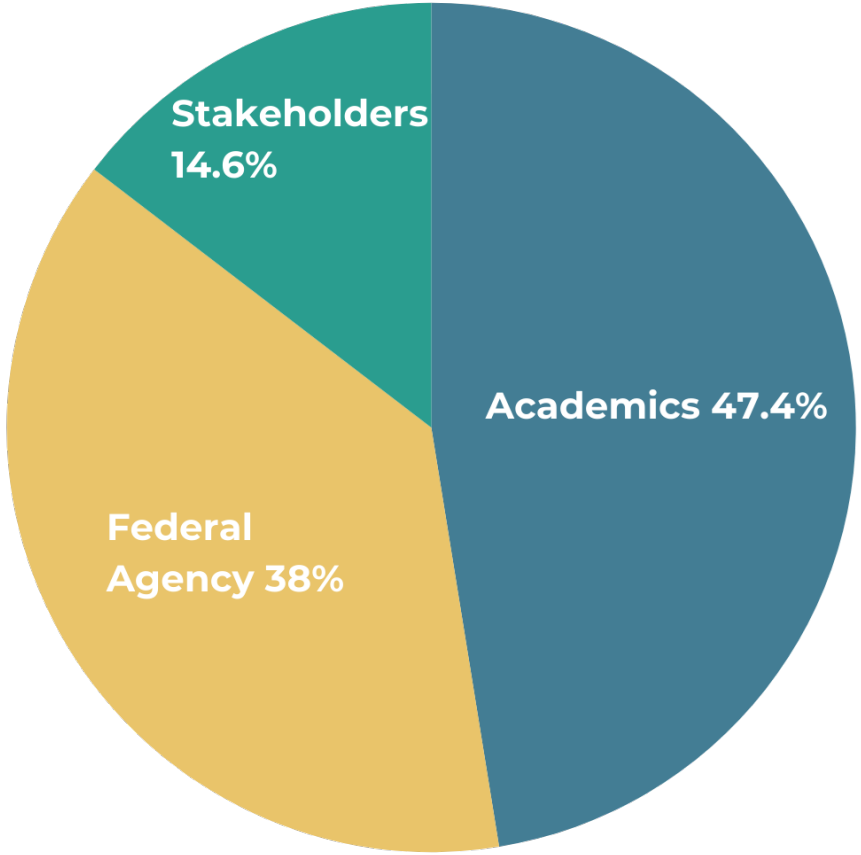
Immediate Needs & Technical Challenges	NOAA	USGS	USACE	DOT	NRL	NASA	BOEM	FEMA	NPS
Compound flooding tools			x	x	x			x	X
Sediment transport processes			x		x		x		X
Longterm trend data	x			x				x	x
Climate change impact		x	x				x		x

Stakeholder Survey & Scoping Session

- **Coastal resilience** was the most significant immediate challenge faced by stakeholders.
- Coastal stakeholders most common shortcomings include **research, outreach, and data.**

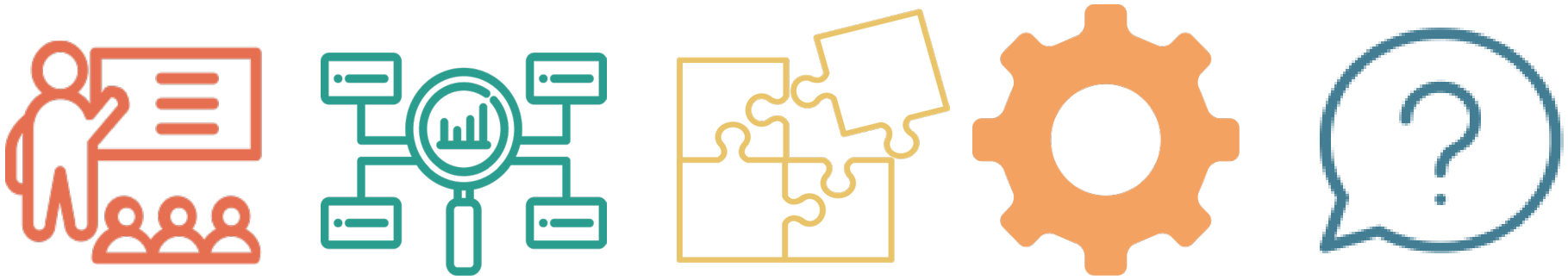


2024 Decadal Visioning Workshop Participants



USCRP 2024 Decadal Visioning Workshop

Working through challenges and solutions to actionable research.



Presentations

Speakers discuss progress and perspectives on coastal challenges and priorities for the next 10 years of coastal research.

Community Needs

What challenges will we face in the next 10 years?

Co-Developed Solutions

How do we move forward to addresses these challenges?

Tools & Approaches

What tools and implementation strategies do we need to achieve solutions?

Research Questions

What research questions need to be addressed for successful tools and approaches?

Workshop Priority Coastal Challenges Identified

Coastal Flooding & Extreme Events

Adaptation

Sediment Transport & Morphologic Change

Ecosystem Restoration & Water Quality

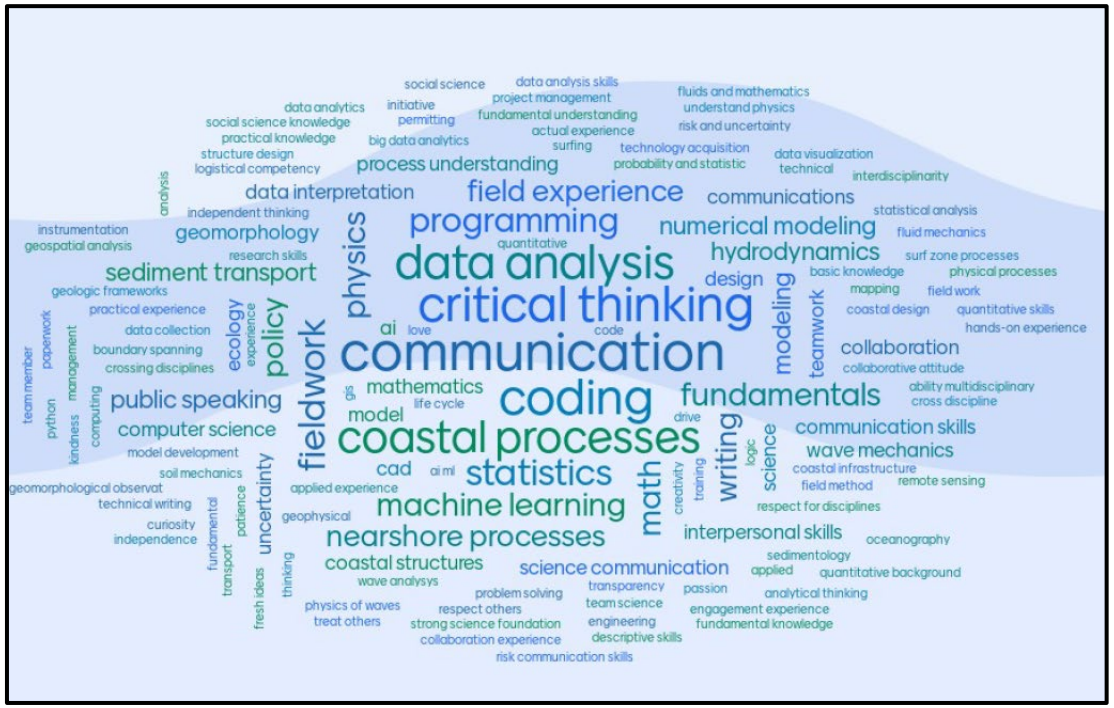
Decadal Visioning Workshop Takeaways

- Research is needed at **all scales** to transition from **foundational science** to **operational models** to **public information**.
- Need to collaborate **across disciplines** to **co-develop** effective **solutions** to coastal challenges.
- Interdisciplinary work must be at the right scale, **intentional**, **well-planned**, and **inclusive**.
- Need to incorporate influences of **humans and ecosystems** to understand current and future **shoreline change**.
- **Nature Based Solutions** should be considered as a **continuum**.
- Need methods to measure **effectiveness** in **adaptation strategies.**

Workforce Development Session Takeaways

- **2012** → U.S. programs in decline due to lack of funding, educational opportunities decreasing, USACE R&D funding declining
- **2018** → Funding decreasing/difficult to obtain, generally small number of faculty, post-docs, substantial staffing needs in federal agencies
- **2024 Survey Preliminary Results:**
  - Funding for research/graduate student training has increased.
  - Graduate programs have stable or increasing course offerings, where fundamentals are taught regularly.
  - Fewer students are remaining in academia.

Key Skills and Competencies Needed



Summary of R&D Gaps and Recommendations

What's Next

- Seeking detailed feedback from the community on themes, content, and priorities identified through the workshop.
- Future of Coastal Processes Research report to lay the foundation for the next decade.

BCER Guidance on USCRP R&D Gaps and Needs

- 2025 Federal Agency Leadership Meeting
  - Federal agencies define a common purpose and goals to advance a common mission, each bringing unique expertise.
  - Need BCER champion to engage top federal agency leadership.
  - Develop strategic implementation plan in collaboration with federal agency partners.
- As a BCER initiative, is the USCRP on track and aligned with BCER needs and expectations? What should be the USCRP focus moving forward?

Thank you!
Questions?

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USCRP Decadal Visioning Workshop Materials:

https://uscoastalresearch.org/2024-decadal-workshop