



U.S. Coastal Research Program: Preparing for the Next Decade of Coastal Research Needs, Challenges, and Opportunities

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ASBPA National Coastal Conference
27 August 2024

“The Nearshore Report is a catalyst for the nearshore research community to leverage its strong existing relationships to enrich a heretofore distributed approach to U.S. nearshore research.”

USCRP: Preparing (for) the Next Decade

- Introduction
- Part I: What is the US Coastal Research Program?
- Part II: Decadal Visioning Workshop (June 2024)
- Part III: Workforce Development
- Get Involved

Part I: What is the USCRP?

“The USCRP exists to coordinate federal activities, strengthen academic programs, and address coastal community needs.”

Program Goals & Objectives

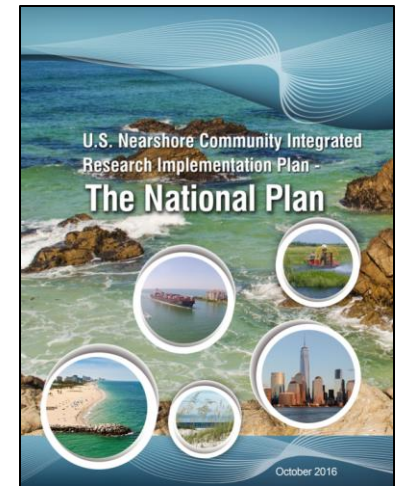
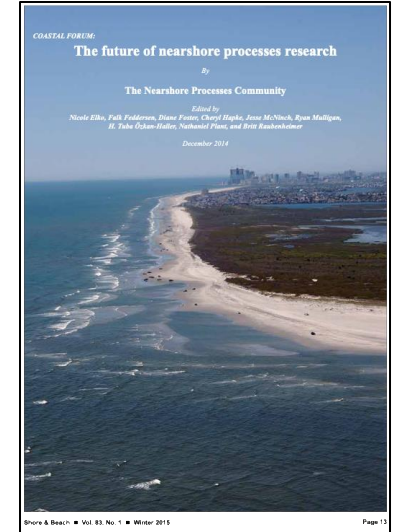
The U.S. Coastal Research Program (USCRP) is a multi-agency led effort to **coordinate** federal activities, **strengthen** academic programs, and **address** coastal community needs by *identifying* coastal research priorities, *enhancing* funding for coastal academic programs, *fostering* collaboration, and *promoting* science translation. USCRP is guided by priorities of coastal leaders in federal agencies, academics, and non-governmental organizations and by the overarching framework and needs as identified in the seminal 2014 Nearshore Research Report (Elko et al. 2015).

Part I: What is the USCRP?



Historical Perspective

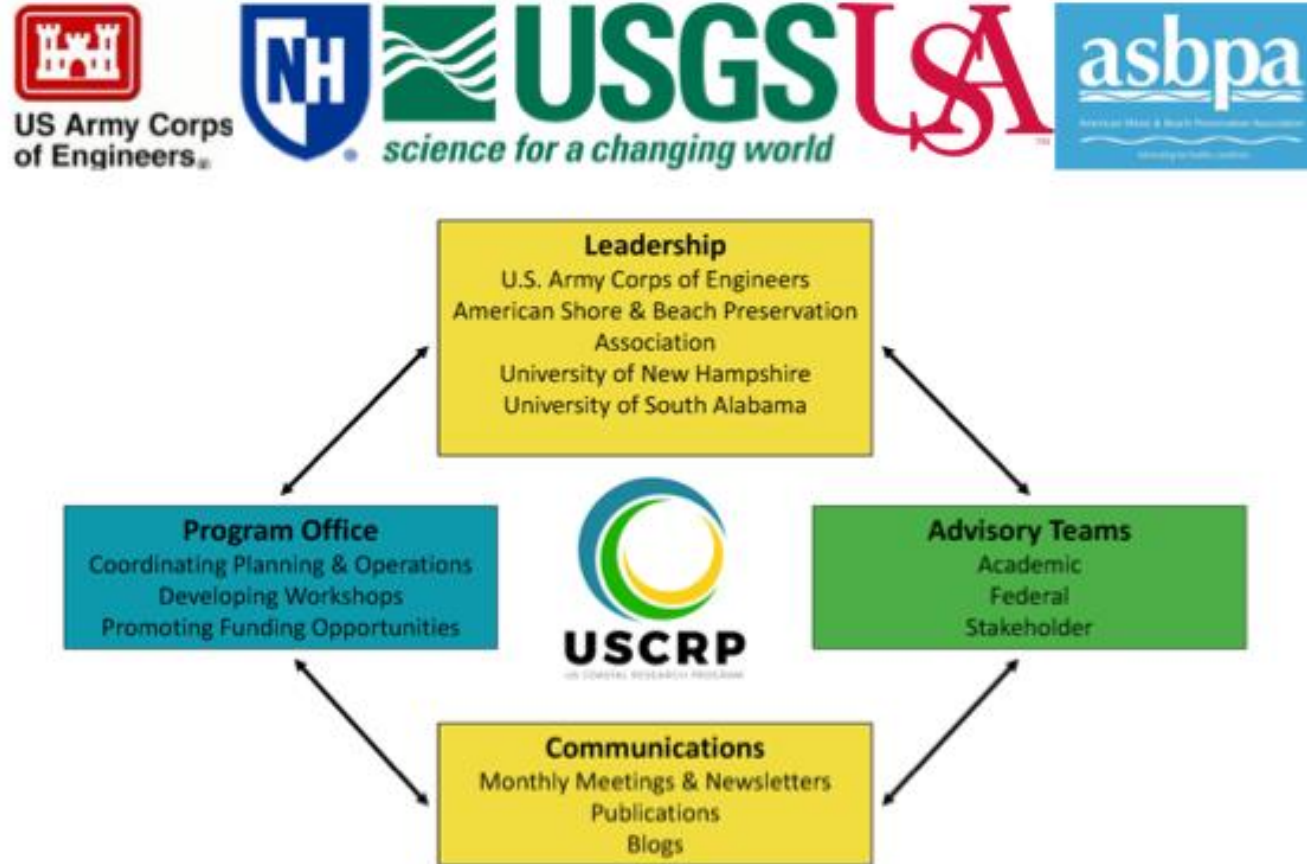
- Prior to 1989
- St. Pete I, 1989
- St. Pete II, 1998
- Duck, 2002
- Duck, 2014
- Kitty Hawk, 2016
- St. Pete, 2024



Part I: What is the USCRP?

USCRP has funded 77 projects surrounding Extreme Events, Long-Term Coastal Evolution, and Human & Ecosystem Health

Organization & Leadership



USCRP Leadership Team



Dr. Julie Rosati
USCRP Co-Executive Director, Federal Lead
USACE Engineering Research & Development Center



Dr. Nicole Elko
USCRP Co-Executive Director, Stakeholder Lead
American Shore & Beach Preservation Association



Dr. Diane Foster
USCRP Co-Executive Director, Academic Co-Lead
University of New Hampshire



Dr. Bret Webb
USCRP Co-Executive Director, Academic Co-Lead
University of South Alabama

USCRP Academic Team



Dr. Dan Cox
Oregon State University



Dr. Joe Long
University of North Carolina Wilmington

Part I: What is the USCRP?

Organization & Leadership

FEDERAL TEAM

The Federal Team reports on current agency research activities, mission objectives, and opportunities within each agency. The Federal Team has been meeting to identify agency coastal research priorities ahead of the 2024 workshop. The Team supported the FY 2023 request for proposals review and helped develop the project database. The Federal Team is looking forward to sharing findings at the 2024 workshop, continuing to identify opportunities for collaboration, and connecting with stakeholders and academics.



ACADEMIC TEAM

The Academic Team provides direction on academic funding, existing programs, and graduate education. The Team is currently composed of representatives from University of New Hampshire, University of South Alabama, University of North Carolina at Wilmington, and Oregon State University. We took time in 2023 to restructure, share insights on database development, and guide staff on academic funding. We are looking forward to continuing to support the 2024 Decadal Workshop planning and other academic lead activities.



Part I: What is the USCRP?

Pictured L to R:

*Bianca
Charbonneau*

Diane Foster

Nicole Elko

The Diversity Hire

Julie Rosati

Jenna Brown

Annie Mercer

Mary Cialone

Jessie Straub



Part I: What is the USCRP?

*Complex
issues that
require
integrated
approaches
AND provide
opportunities
for unique
partnerships*



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

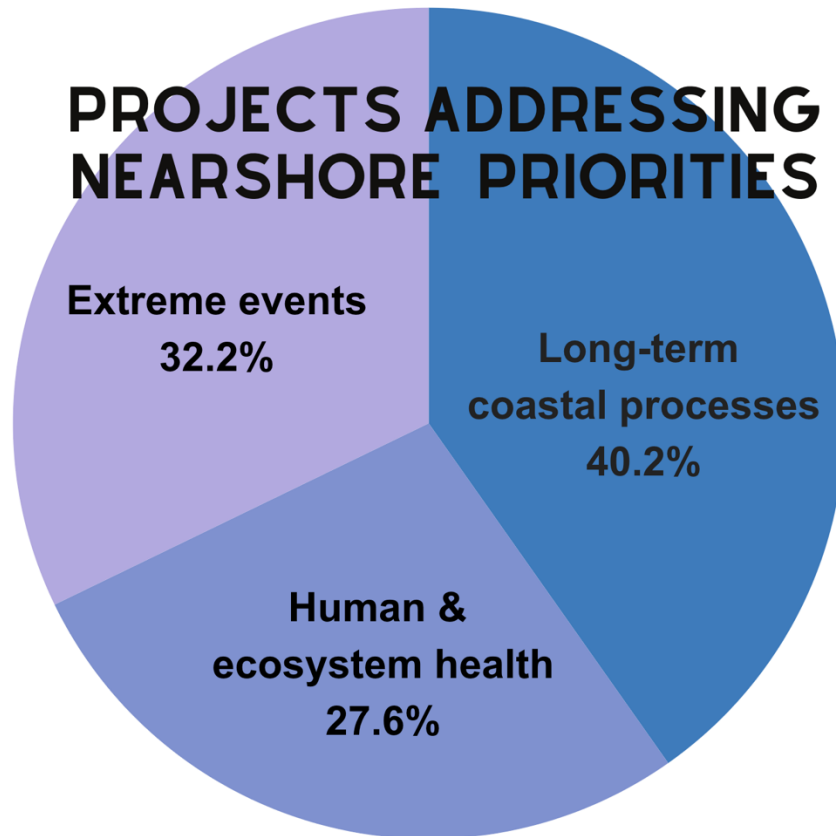


Biological, Chemical, and Physical Processes:

Impacts to human and ecosystem health

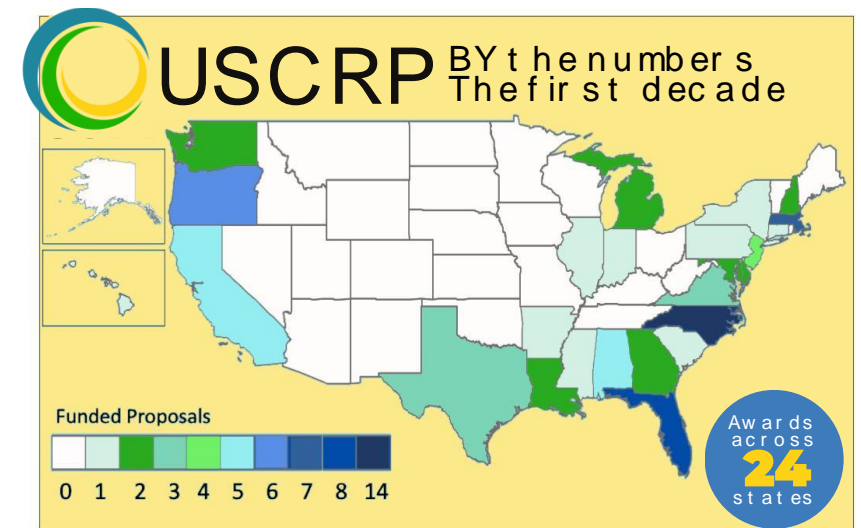
Part I: What is the USCRP?

PROJECTS ADDRESSING NEARSHORE PRIORITIES



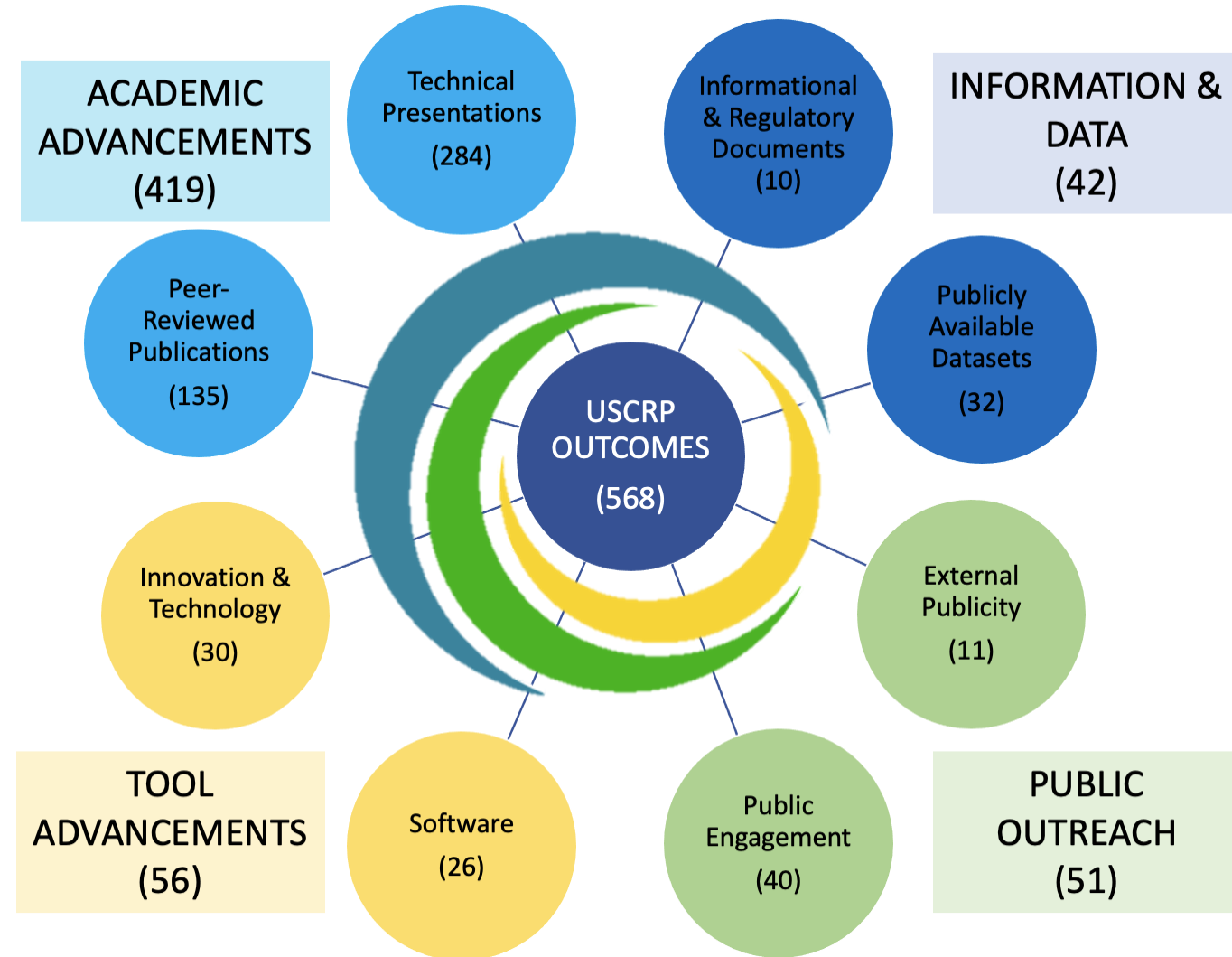
US Coastal Research Program (2016 – 2023)

- 516 Proposals Received
- 77 Proposals Funded
- \$150M Requested
- \$23.5M Awarded



Part I: What is the USCRP?

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



Part I: What is the USCRP?

USCRP Visioning Sessions

- Future of Nearshore Processes (2014)
- Interagency Collaboration (2016)
- Federal and Academic Collaboration (2016)

Year	Research Theme	Needs Identified Via	# Funded Projects	Total Funding
2016	Dunes on Developed Coasts	Thematic Workshop	5	\$220K
2018	Storm Processes and Impacts	Thematic Workshop	7	\$775K
2019	Research in Support of Federal Stakeholder Priorities (Including DUNEX)	Interagency Collaboration	24	\$5.4M
2020	Federal Science Priorities in Long-term Processes and Estuarine Ecosystems	Interagency Collaboration	15	\$5.0M
2021	Human and Ecosystem Health in the Coastal Zone	Thematic Workshop	11	\$3.3M
2022	Translating Coastal Research into Application	Interagency Collaboration	11	\$4.4M
2023	SEDiment transport COLlaborative LABoratory Experiment (SEDCOLAB)	Interagency Collaboration, Expert Steering Committee	5	\$5.0M

Part I: What is the USCRP?

Dune management challenges on developed coasts

Nicole Elko, Kate Brodie, Hilary Stockdon, Karl Nordstrom,
Chris Houser, Kim McKenna, Laura Moore, Julie Rosati, Peter Ruggiero,
Roberta Thuman, and Ian Walker



Shore & Beach ■ Vol. 84, No. 1 ■ Winter 2016

Advancing the understanding
of storm processes and impact

Nicole Elko, Casey Dietrich, Mary Glalone, Hilary Stock
Matt W. Biskie, Brandon Boyd, Bianca Charbonneau, Dan Cox, Kendra
Amanda Lewis, Patrick Lamber, Joe Long, Chris Massey, Talia Mayo,
Norberto Nadal-Caraballo, Britt Raubenheimer, Tori Tomiczek, and

2007; Harris 2010; Irujo and Irujo 2010). The authors have found that more than \$100 billion in assets are at risk from climate change, as well as "the availability of the sea as a source of food and energy" (Irujo and Irujo 2010, p. 10). In the emerging climate, we live under a "new normal" (Harris 2010, p. 10), which is characterized by increasing uncertainty, which in turn is even more devastating than the uncertainty that we have experienced in the past (Harris 2010). Therefore, engineers, community leaders, and coastal residents need to take a more holistic approach to the design of storm processes and their impact on coastal infrastructure. This approach is needed to assess the risk and to reduce risk and its impact on property during storm events. However, the current design approach for coastal protection and modeling of storm processes is based on the use of a "normal" design storm, which is characterized by a return period of 100 years, with a design wind and meeting the needs of the coastal community. The current approach for emergency management decisions is to determine needed advanced information from the U.S. Coastal Flood Risk Assessment Program (CFRAP) and the Storm Process and Impacts Workshop (SPIW) (Harris 2010; Irujo and Irujo 2010; Harris 2010; St. Petersburg, Florida). The attendees included local coastal managers, emergency management officials, state agencies, federal agency scientists and engineers, and other stakeholders (e.g., scientists and engineers). Workshop objectives were to synthesize present knowledge of coastal storm processes and forecasting impacts and to present the findings of the workshop to the public. The workshop provided an opportunity to bridge the gap between the public and the coastal managers by presenting the information being distributed publicly and to the emergency management officials and other users. Finally, a plan for the workshop was developed (Harris 2010; St. Petersburg, Florida) and was presented at SPIW (St. Petersburg, Florida) (St. Petersburg, Florida) (St. Petersburg, Florida).

Shore & Beach ■ Vol. 87, No. 1 ■ Winter 2019

Human and ecosystem health in coastal systems

Nicole Elko,¹ Diane Foster,² Gregory Kleinheinz,³ Britt Raubenheimer,⁴
Susanne Brander,⁵ Julie Kinzelman,⁶ Jacob P. Kritzer,⁷ Daphne Munroe,⁸
Curt Storziazzi,⁹ Martha Sutula,¹⁰ Annie Mercer,¹¹ Scott Coffin,¹² Carolyn Fraioli,¹³
Luke Gieger,¹⁴ Elise Morrison,¹⁵ Gabrielle Parent-Doliner,¹⁶ Cigdem Akan,¹⁷
Alberto Canestrelli,¹⁸ Michelle DiBenedetto,¹⁹ Jackelyn Lang,²⁰ and Jonathan Simm

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Technical Contributions

- Dune Management Challenges
- Storm Processes and Impacts
- Human & Ecosystem Health
- What's Next?

Dune Mgmt

- 2015
- Kill Devil Hills
- Elko et al. (2016)

Storm Impacts

- 2018
- St. Pete
- Elko et al. (2019)

HEH @ the Coast

- 2021
- Virtual
- Elko et al. (2022)

Part I: What is the USCRP?



**Become a
Member**

Are you ready to become a member of USCRP?

- Keep up to date on the latest in coastal research
- Contribute to the discussion
- Help shape the next decade of research
- Follow us on the socials...



Facebook



Instagram



Twitter

JUNE 11 – JUNE 13

Hilton St. Petersburg Bayfront – 333 1st Street, SE

Decadal Visioning Workshop

**THE FUTURE OF COASTAL
PROCESSES RESEARCH**



2024

Meeting Overview

Special thanks to the Steering Committee and Council Oak

Part II: Decadal Visioning Workshop

Steering Committee

Tiffany Roberts Briggs (FAU)
Jenna Brown (USGS)
Bianca Charbonneau (USCRP)
Mary Cialone (USACE)
Greg Dusek (NOAA)
Nicole Elko (ASBPA)
Diane Foster (UNH)
Adam Gold (EDF)
Annie Mercer (ASBPA)
Jon Miller (Stevens Inst.)
Mara Orescanin (NPS)
Meg Palmsten (USGS)
Jack Puleo (UDEL)
Julie Rosati (USACE)
Peter Ruggiero (OSU)
Daniel Sharar-Salgado (FHWA)
Jessie Straub (USACE)
Ethan Theuerkauf (MSU)
Bret Webb (USA)
Council Oak Staff

Purpose & Goals

Bring together **Federal Agencies, Stakeholders**, and **Academia** to *identify* and *prioritize* key management challenges and high priority science gaps to *guide* the next decade of coastal research.

USCRP TO HOST DECADAL VISIONING WORKSHOP



Workshop Intent

The workshop will take place at the Hilton St. Petersburg Bayfront from 12:00 PM ET Tuesday, June 11 through 12:00 PM ET Thursday, June 13, 2024.

At the Visioning Workshop, participants will explore the future direction of coastal research, share valuable insights, and engage in stimulating discussions with professionals and researchers who are passionate about addressing the challenges faced by coastal communities.

Objective: Bring together Federal Agencies, Stakeholders, and Academia to identify and prioritize key management challenges and high priority science gaps to guide the next decade of coastal research.

Agenda

Tuesday June 11th

- 10-year Review and State of Nearshore Research
- Stakeholder Perspective and Local Societal Needs and Challenges
- Summary of Research Priorities from Federal Agencies and Academia

Wednesday June 12th

- Co-developing Solutions to Coastal Challenges
- Applied Research Opportunities to Implement Solutions

Thursday June 13th

- Topical Science and Fundamental Research
- Articulating Workforce Development Needs
- Compiled Information on Workforce Needs and Gaps

Invitation

We invite agency, academic, non-governmental, and stakeholder members to join us at the Hilton St. Petersburg Bayfront. Please visit our website and RSVP via Eventbrite!

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

Please register by May 24, 2024.

POINT OF CONTACTS:

Justin Lini Council Oak JLini@thecounciloak.com	USCRP Staff US Coastal Research Program contact.uscrp@gmail.com
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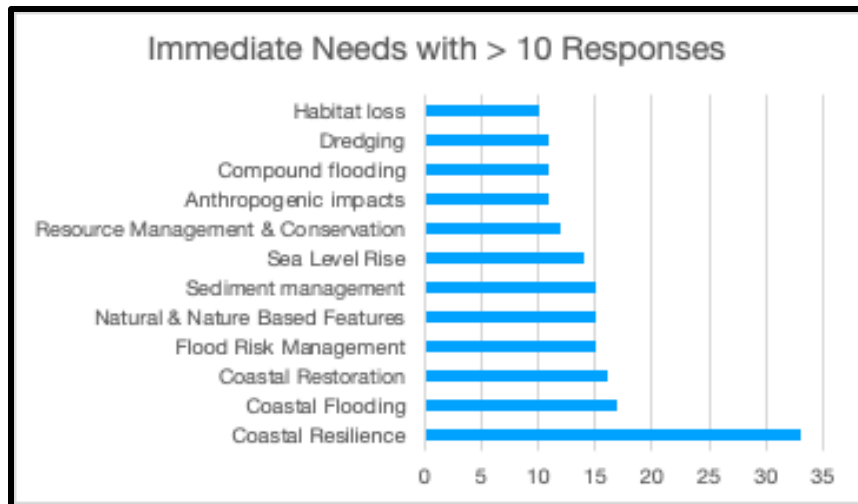
USCRP
US COASTAL RESEARCH PROGRAM



Eventbrite RSVP

TUESDAY, JUNE 11 - THURSDAY, JUNE 13
St. Petersburg, Florida
Hilton St. Petersburg Bayfront

Part II: Decadal Visioning Workshop



Pre-Workshop Preparation

- +1 year in the making (steering committee)
- Federal partners survey (n=8)
- Stakeholder survey
- Scoping sessions

Immediate

- Sediment transport
- Compound flooding

Long-Term

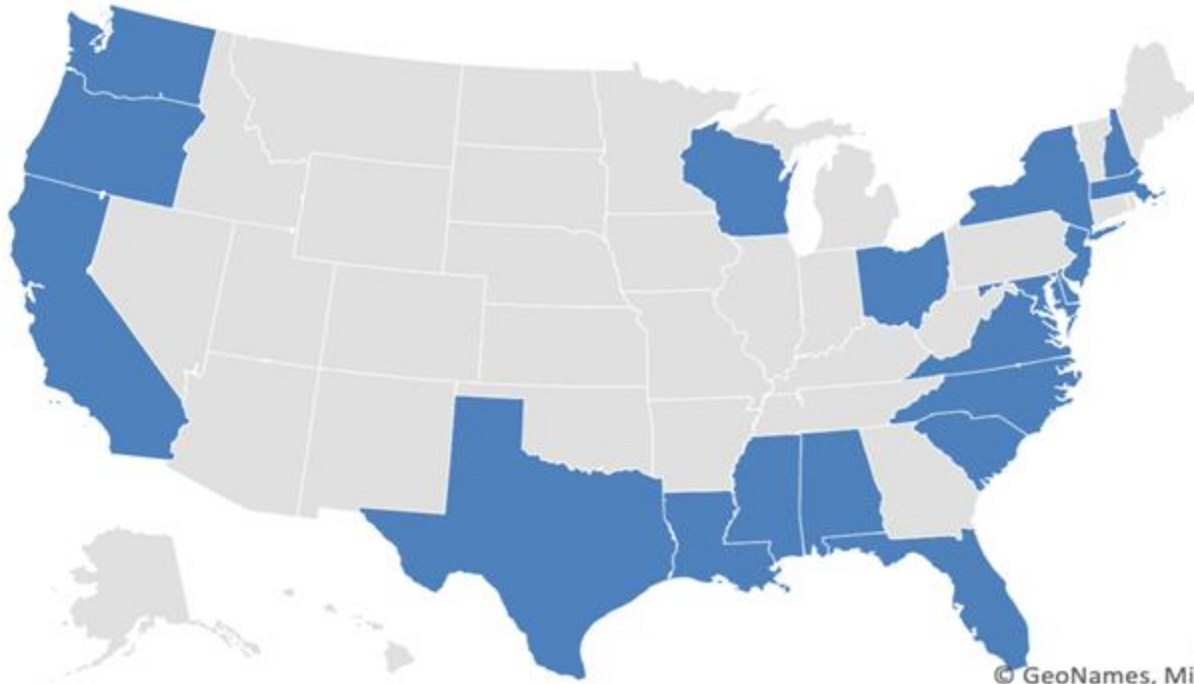
- Flood Risk Reduction
- Nature-based Features

Other

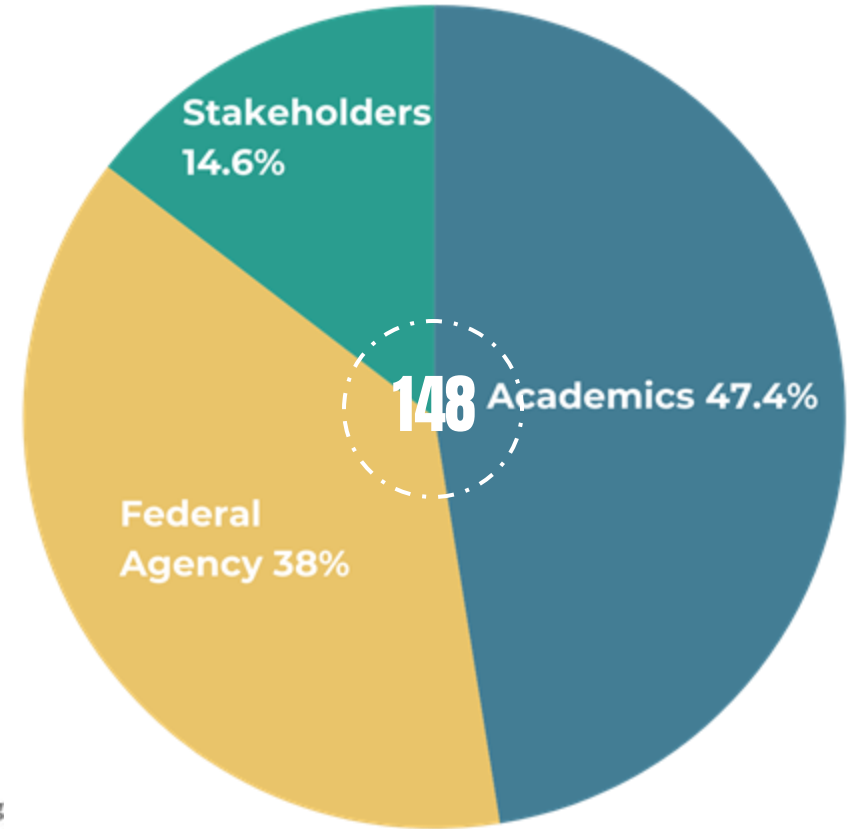
- Climate change
- Workforce preparedness

Part II: Decadal Visioning Workshop

USA Australia Canada China
Italy India United Kingdom Netherlands



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Part II: Decadal Visioning Workshop



Part II: Decadal Visioning Workshop

“There is a need to improve how federal agencies communicate technical and scientific data to coastal communities so that they offer the best decision support possible.”

Working through challenges and solutions to actionable research



Part II: Decadal Visioning Workshop

Arriving at Co-Developed Research Themes

Establish Technical Relevance, Challenges, Needs

- Technical Presentations
- Panel Discussions
- Orientation

Share Experiences & Collaborate

- Themes
- Breakout Groups
- Brainstorming
- Capture Input

Synthesize & Discuss

- Lump and Split
- Identify Trends
- Highlight Common Elements
- Inform Next Discussion

***Identified
Priorities***



Part II: Decadal Workshop Summary

“Participants joined in a set of four facilitated breakout sessions. These sessions were focused on identifying actionable research.”

Co-Developed Priorities

- Ecosystem Changes & Habitat Disruption
- Water Quality
- Coastal Flooding
- Coastal Adaptation



Part II: Decadal Workshop Summary

“Research needed at all scales to transition from foundational science to operational models to public information.”

Some Key Workshop Takeaways

- Machine learning and artificial intelligence
- Remote sensing and model-data assimilation
- Bulldozers ARE NOT in our models
- Social science and community engagement

-
- Our community is growing
 - Our community is becoming more diverse
 - We still have a lot of work to do!

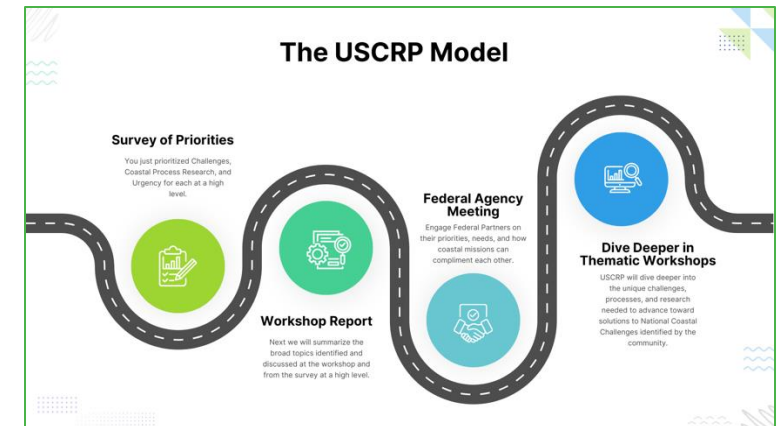
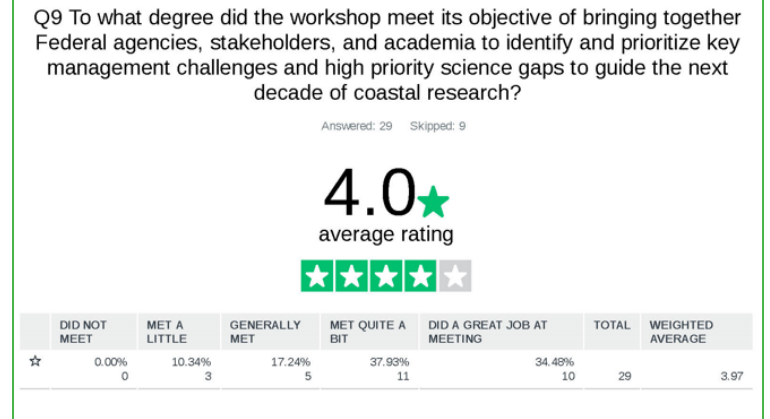


Part II: Decadal Workshop Summary

“This interdisciplinary work must be at the right scale, intentional, well-planned and inclusive.”

Next Steps

- Distill workshop summary report
- Conduct post-workshop survey
- Form writing teams
- Synthesize all input/feedback
- Draft workshop white paper

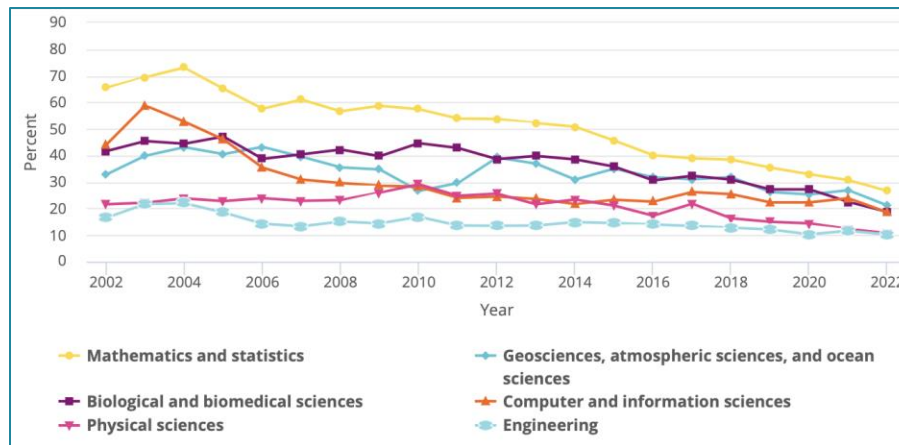


Part III: Workforce Development

“U.S. academic programs need to be revitalized and expanded to ensure that the nation has the technical expertise and workforce needed to meet growing demands and to enjoy the economic and employment benefits of a vibrant and world-leading coastal engineering sector.”

Threats to our Domestic Coastal Workforce

- Silver Tsunami, Great Retirement Boom, Brain Drain
- The demographic cliff
- Declining interest in college degree
- Shrinking academic commitments

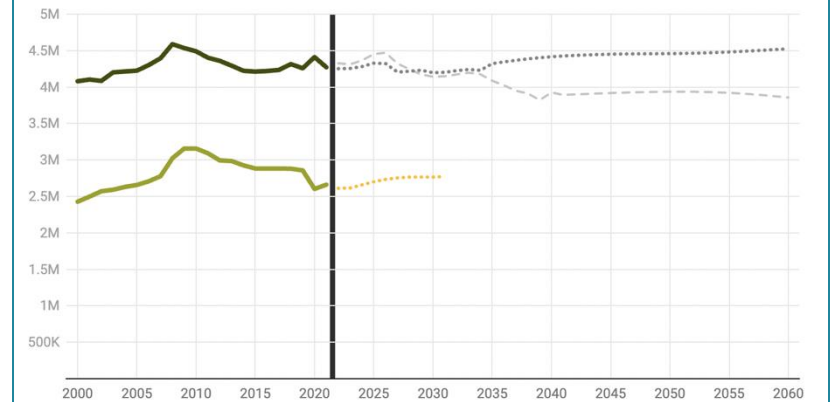


Source: NSF Survey of Earned Doctorates

Population of 18-Year-Olds Is Projected to Crater

The Census previously forecast, before the pandemic, that the number of 18-year-olds would rebound after 2035.

The darker-shaded lines (—) are derived from data sourced from the U.S. Census Bureau. The lighter-shaded lines (---), which depict estimates of freshman enrollment, are from U.S. Department of Education data. The --- line represents Census estimates of America's future 18-year-old population, as modeled in 2023. The * * * and * * * lines are derived from projections preceding that 2023 modeling.



Source: U.S. Census Bureau and U.S. Department of Education • Get the data • Created with Datawrapper

Source: The Chronicle of Higher Education

Part III: Workforce Development

“Utilize a new and/or existing collaborative funding mechanism for graduate student fellowships to foster the next generation of nearshore scientists and engineers.”

What Did We Say... in 2012?

- US programs in decline due to lack of funding
- Educational opportunities decreasing
- USACE R&D funding declining

AMERICAN SHORE & BEACH PRESERVATION ASSOCIATION
POLICY STATEMENT

The state of U.S. coastal engineering & science

Science and Technology Committee
American Shore & Beach Preservation Association
February 2012

Policy

The state of U.S. coastal engineering and science is in flux. ASBPA is concerned that academic coastal engineering and science programs in the U.S. may seriously decline in the next five to ten years, in part due to reduced federal funding. ASBPA seeks to restore confidence in our national coastal expertise. ASBPA seeks to partner with agencies, academia, and the private sector to work toward improving the state of U.S. coastal engineering and science. ASBPA supports state and local efforts to promote U.S. engineering and science. ASBPA seeks to assist in the implementation of the slightly revised versions of the following recommendations from the 1999 National Research Council study, “Meeting the Research and Educational Needs in Coastal Engineering”

1. The coastal engineering & science academic community should establish a consortium to improve research and education through cooperative arrangements for leveraging major research facilities and educational capabilities.
2. The National Science Foundation should establish a program to fund fundamental research on coastal engineering and science (in its Engineering Division and/or elsewhere).
3. The USACE and other federal agencies should establish a substantial program to fund applied research in academic coastal engineering and science programs and promote partnerships between academia, federal agencies, & private interests.

Issue

In recent years, foreign coastal expertise has been called upon in support of complex problems involving the physical dynamics, erosion and environmental impacts along the U.S. coast. Consortiums of European universities and engineering institutes, for example, have invested millions of Euros in the past decade, or so, on development of expertise and predictive models of coastal change, such as occur due to storms or oil spills. A similar coordinated effort to maintain excellence in coastal engineering and science has not occurred in the U.S. There is a pressing need to promote partnering among U.S. coastal research entities. Academic research has been fragmented and funding levels have diminished. Without a stable funding base, university programs that were once strong in this field struggle to attract our top students to the profession.

ASBPA is concerned about the diminishing level and depth of expertise in U.S. coastal engineering & science and seeks to restore excellence in this field. ASBPA has investigated this concern by examining the three “legs” of U.S. coastal engineering and science: federal agencies, academia, and the private sector. Academics do not have a coalition to support funding for coastal research. Large-scale research programs and field experiments with federal and academic partnering (e.g., SANDYDUCK or the National Sediment Transport Study) have not been

Page 1 of 2

What Did You Say... in 2018?

- Funding decreasing, difficult to obtain
- Generally small number of faculty, post-docs
- Substantial staffing needs in fed agencies

What Did You Say... in 2024? -> Stay Tuned for a Forthcoming Contribution from your Friendly ASBPA S&T Committee!!!

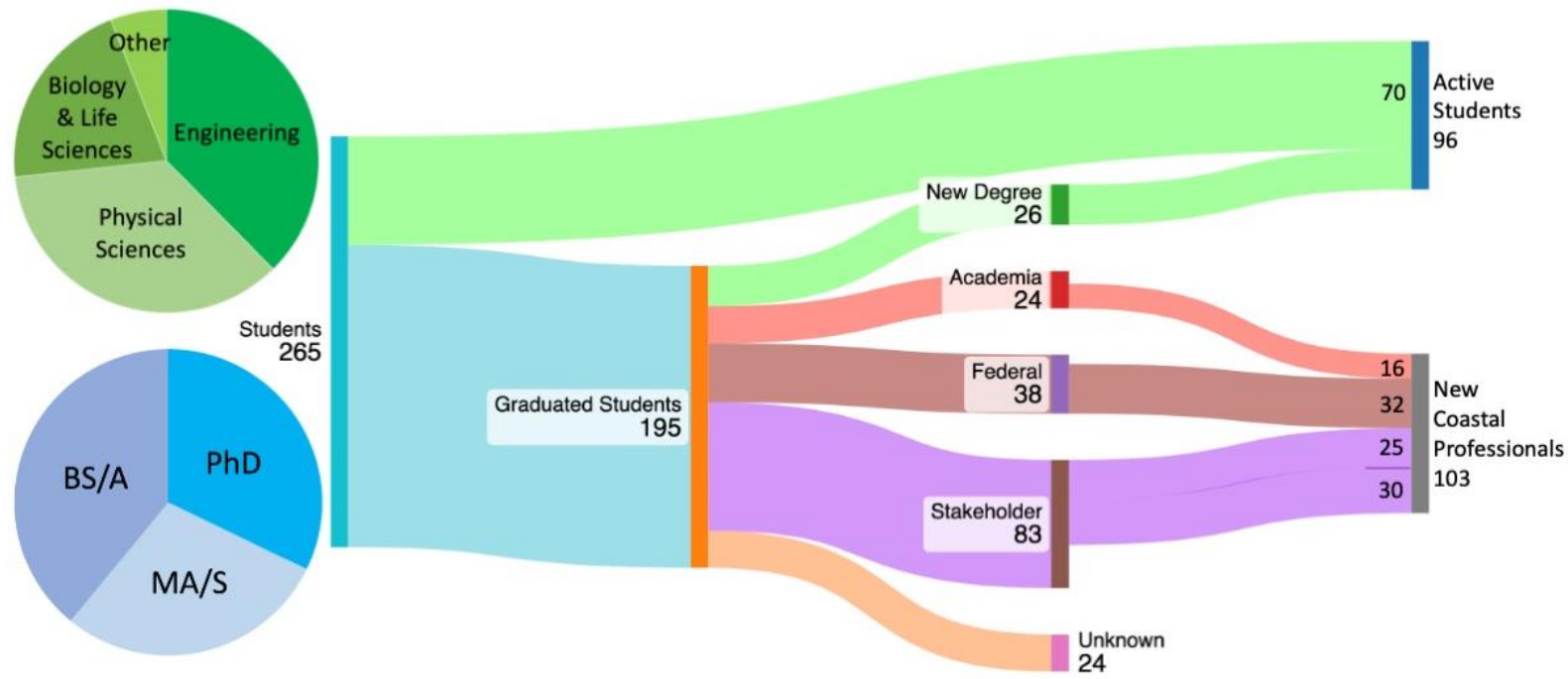
Briggs, Elko, Marsooli, Miller, & Webb (TBD)

Shore & Beach ■ Vol. 86, No. 4 ■ Fall 2018

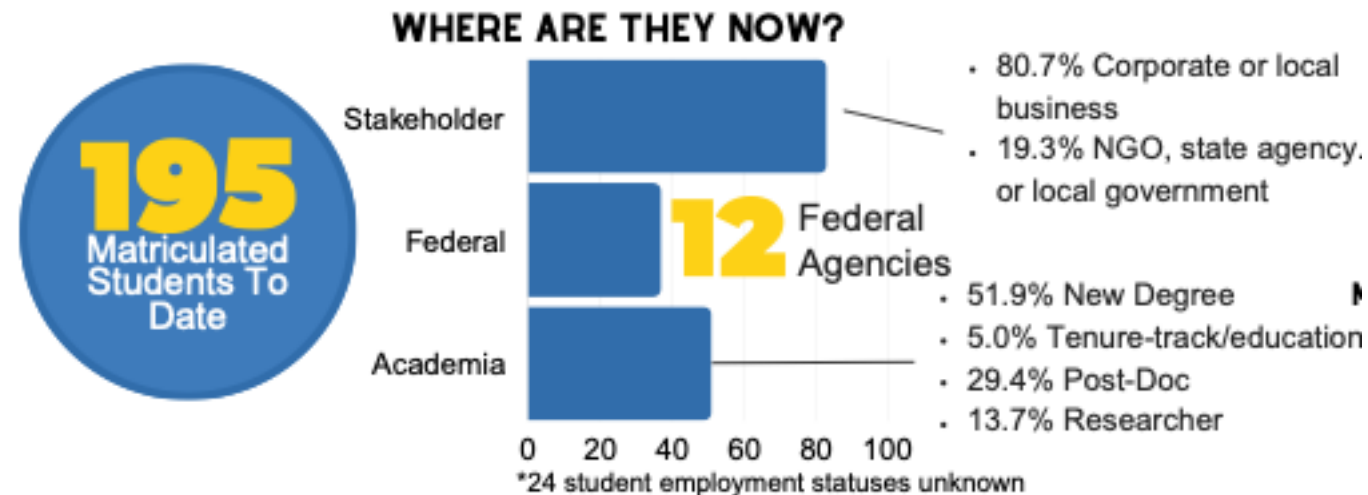
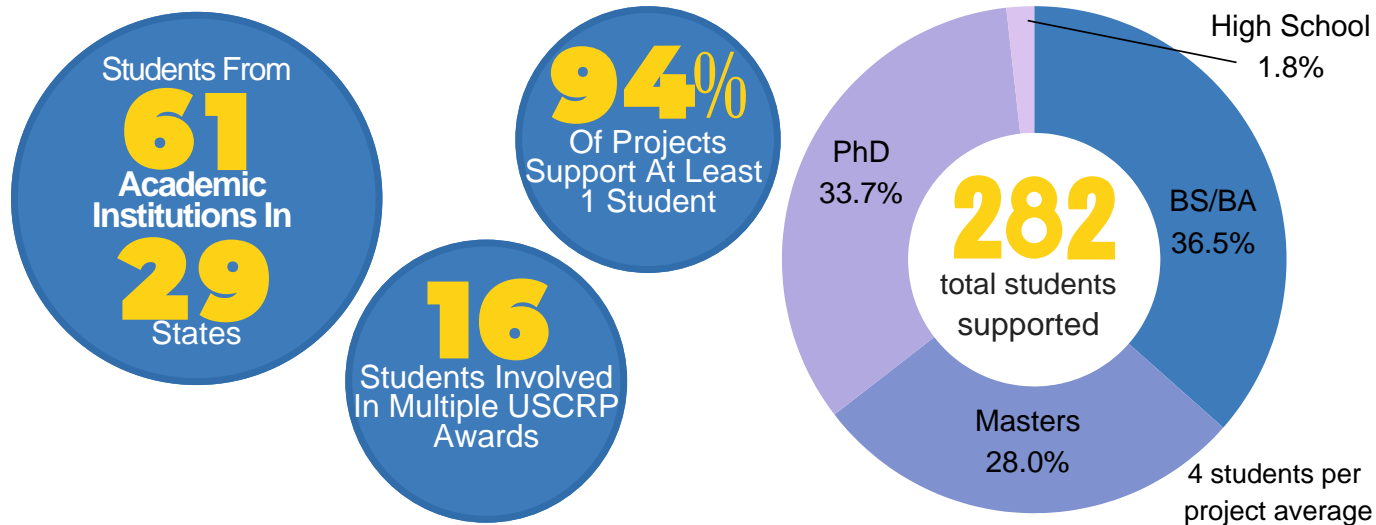
Part III: Workforce Development

How is the USCRP Fostering the (US) Coastal Workforce?

- Go see Bianca Charbonneau's presentation 6C Thursday 8:20-8:40 *Perspectives of USCRP Student Researchers on Potential Futures in the Coastal Workforce.*



Part III: Workforce Development

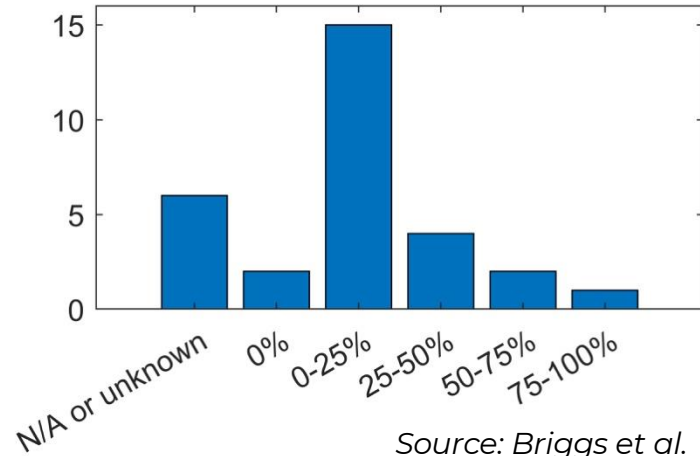


USCRP Impact

- Engineering – 36%
- Physical Sciences – 33%
- Biology & Life Sciences – 21%
- Environmental Studies – 6%
- Policy/Planning/Social – 4%

In 2018, the *entire* USACE coastal technical staff totaled 201!
- Elko et al. (2018)

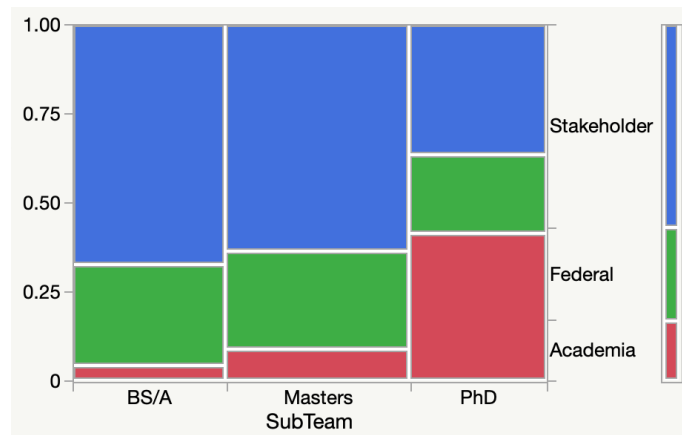
Part III: Workforce Development



Survey Efforts – ASBPA + USCRP

What percent of graduate students joined the US workforce and remained in academia?

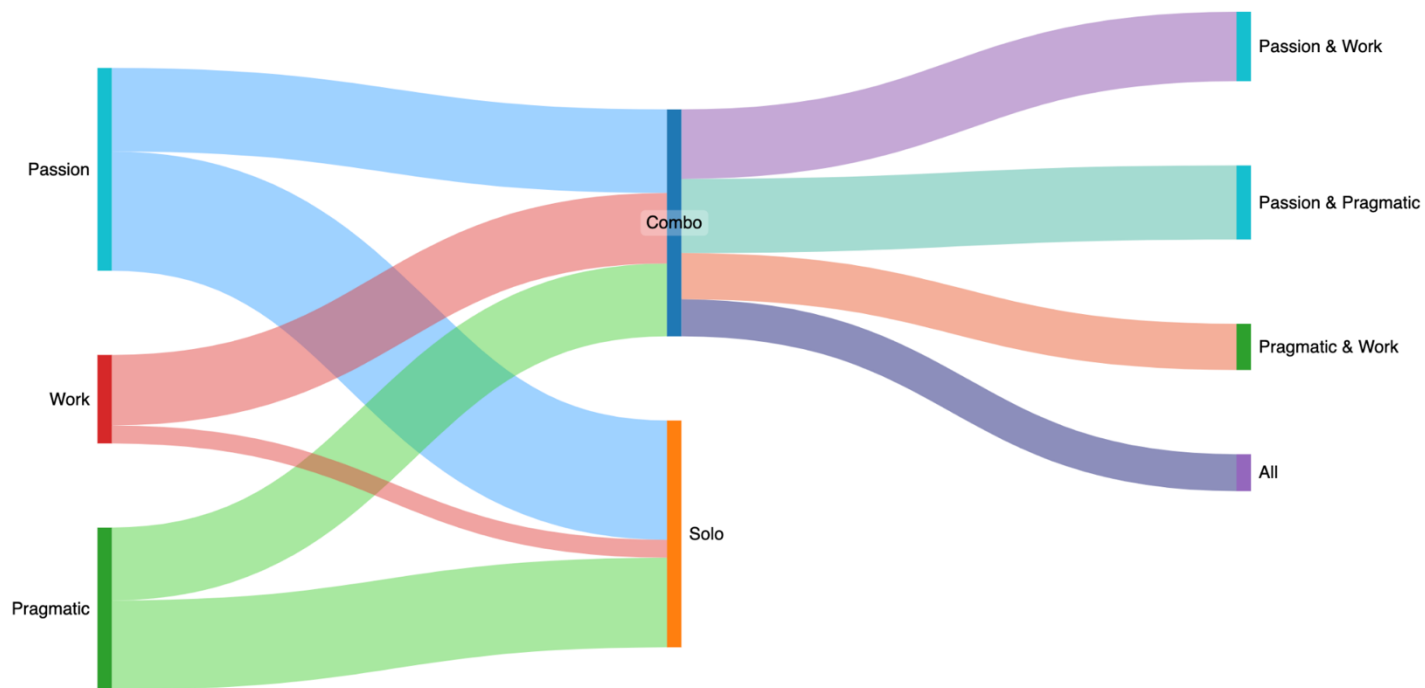
- Fewer students are remaining in academia. While some international students are staying in the US workforce, many reported a rate of <50% or unknown. -ASBPA Academic Stakeholder Survey
- Those obtaining a PhD are more likely to remain in academia than any other degree, but still at rates <50% with most working for stakeholder groups. -USCRP Student Coastal Workforce Impact Survey



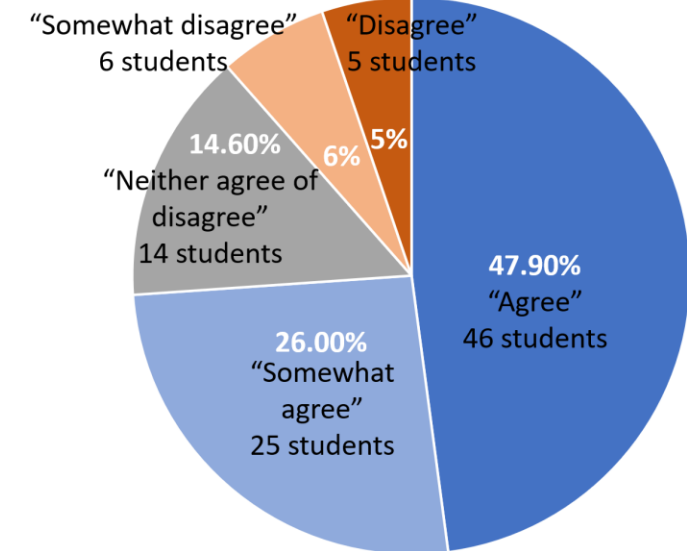
Part III: Workforce Development

Some Good News!

- Coastal professionals tend to be motivated by passion, which may help us resist national trends.



I would not have pursued or considered pursuing a career in the coastal sector without exposure to coastal topics in an academic setting.



Source: Charbonneau et al.

Part III: Workforce Development

“Now we have access to more funding to support graduate researchers, but fewer people (especially domestic) interested in post-graduate work.”

More Ways to Vibe with Workforce Development

- Bianca’s paper and talk 6C Thursday 8:20-8:40 *Perspectives of USCRP Student Researchers on Potential Futures in the Coastal Workforce*
- ASBPA Science & Technology – 2024 Survey of Academics
- Undergraduate education survey (WHOVA app) [Joe Long, UNCW]

Part III: Workforce Development

Help with Undergraduate Education



Knowledge/Skills/Experience

Soft Skills

Non-Traditional Courses

Additional Comments



**WHAT DOES *YOUR* FUTURE OF
COASTAL PROCESSES
RESEARCH LOOK LIKE?**

HOW CAN *YOU* HELP?



**Become a
Member**



Facebook



Instagram



Twitter