NOAA HAB LIAISON PROJECT

Outputs, Outcomes, Accomplishments, and Impacts

KEY THEMES: Communication & Collaboration; Connections & Capacity Building; Workshops & Symposia

OUTPUTS:

1. Workshops, Symposia, and Training: (Obj. 1, 2 & 3)
- **35** stakeholder workshops, symposia, training sessions, focus groups and listening sessions
- **44** professional presentations and **4** conference sessions.

2. Resource Development: (Obj. 1, 2 & 3)
- **12** Surveys, evaluations.
- **31** resource materials developed to support stakeholders, including **CoastWatch** training materials and tutorials, factsheets, and blogs.

3. Networking and Knowledge Sharing: (Obj. 1, 2 & 3)
- Initiated **HAB Chats**, a series of bi-monthly virtual discussions, with participation from over half of the Sea Grant programs.
- Established a **HABs contact** list for seamless communication across NOAA, Sea Grant, and partner organizations.
- Organized **83 "Meet & Greet"** information-gathering sessions with partners such as Mote Marine Laboratory, NOAA NCEI, and the National Weather Service.
- Co-produced **Regional Vignettes** on HABs and hypoxia across nation.

4. Regional and National Collaborations: (Obj. 1, 2 & 3)
- Supported **stakeholders** across multiple states (e.g., Florida, Chesapeake Bay, and Long Island Sound) in improving HAB detection, monitoring, and forecasting, risk communication and evaluating socioeconomic impacts.

> Betty, THANK YOU so much for being a valuable asset to the team. You truly show how our state Sea Grant partners are a force multiplier in our quest to maximize the impact of NCCOS science. Thank you for your thought leadership, time, and effort in making this workshop series a success!"
>
> **— DR. LONNIE GONSALVES,** *Division Chief, National Ocean Service, National Centers for Coastal Ocean Science*

> Hey Betty, thank you so much for talking today and sharing your resources, I really appreciate it! I will chat with the team and Chris and keep you in the loop with any potential webinars involving the HAB tools. Cheers, Annie."
>
> **— DR. ANNIE SCHATZ,** *Aquaculture Projects Coordinator, Maryland Sea Grant College Program*

OUTCOME HIGHLIGHTS:

- **In the Northeastern U.S.**, engagement has resulted in:
  - Real-time satellite bloom information is now being distributed to 36 key stakeholders. Additionally, NOAA is receiving critical feedback and *in-situ* monitoring information from these local stakeholders. (Obj. 2)
  - In Long Island Sound (LIS) specifically, the needs and requirements for satellite data were identified during a 2024 workshop. Research is ongoing to fill these needs, and training is planned for 2025. (Obj. 2)
    - Since workshop, Connecticut Department of Energy & Environmental Protection has regularly included satellite data in their bi-monthly newsletter to their stakeholders.
- **In Chesapeake Bay**, outcomes from a 2023 workshop have led to:
  - Greater coordination with MARACOOS. (Obj. 1, 2)
  - The expansion of the Phytoplankton Monitoring Network to partially address monitoring needs. (Obj. 2)

> Betty, you did a superlative job getting feedback from the users! Ron."
>
> **— DR. RON VOGEL,** *East Coast Operations Manager, NOAA CoastWatch*

> Betty, excellent workshop! Loved the participation from industry - really added to the purpose of developing the products."
>
> **— CHESAPEAKE BAY WORKSHOP PARTICIPANT**

- A prototype forecast in which key users are testing and providing comments. (Obj. 2)
- Progress on the need for higher spatial resolution. (Obj. 2
- Progress on the need to separate bloom species. (Obj. 2)
- Sampling kits have been distributed to recreational fishermen for opportunistic sampling when a bloom occurs. (Obj. 2)

- **In Florida**, several projects and activities have led to the following:
  - Significant progress in understanding the state of the science for cyanobacteria and addressing research priorities identified in 2019. New cyanobacteria research needs and management priorities have been identified (2023) for continuing to move the science forward. (Obj. 1 & 2, leveraged grant from State of Florida - FDEP)
  - A Red Tide Communications Plan for Florida was developed and a communication working group, appointed by the state's HAB Task Force is implementing the plan. (Obj. 1 & 2, leveraged grant from State of Florida - FWC)
  - Research needs were identified by community stakeholders for the promising red tide biological control technology called DinoSHIELD and the lead researchers are incorporating them into future research plans. (Obj. 1 & 2)
  - Methods for assessing macroalgae/benthic cyanobacteria in seagrass areas transferred leading to data-supported management actions. (Obj. 1)

FIGURE 1 DINOSHIELD WORKSHOP DEMONSTRATION OF GCOOS/NCCOS HABSCOPE

- **Nationally**, liaison engagement has led to:
  - Collaboration with federal agencies to complete congressionally mandated South Florida Assessment and Regional Vignettes for National Assessment (as member of the Interagency Working Group for HABs and Hypoxia Research and Control Act). (Obj. 1)
  - New contacts, greater awareness of bloom issues, and follow-up requests for information following a 2022 satellite workshop at U.S. Symposium on Harmful Algae. (Obj. 2)
  - Greater technical and community-based understanding and use of satellite data products and forecasting tools. (Obj. 2)
  - Efforts to address aquaculture specific needs for siting and monitoring around HAB events. (Obj. 2)
  - A mechanism for engaging across the Sea Grant network (HABchats) that serves as a community of practice. (Obj. 3)

ACCOMPLISHMENTS:

1. **Facilitating National Dialog:** Integrated Sea Grant into NOAA's broader HAB management and response efforts, raising the program's visibility and influence. (Obj. 1)
2. **Training & Outreach:** Increased expertise and knowledge sharing across Sea Grant, NOAA, and external stakeholders. (Obj. 2 & 3)
3. **Expanded Stakeholder Involvement:** Created and strengthened partnerships, ensuring continued collaboration on HAB challenges. (Obj. 1, 2 & 3)
4. **Student and Early Career Support:** Played an active role in mentoring and supporting students engaged in HAB research and addressing real-world challenges. (Obj. 1)

> "I wanted to express my gratitude for all the assistance you've provided in connecting me with organizations and individuals for my research surveys on HABs. Your support has been invaluable, and I truly appreciate it. I've acknowledged your contribution in my research as a key collaborator in implementing the study. Currently, I'm in the process of analyzing the data collected, and I look forward to sharing the results with you soon."
>
> **— ASHLEY LACEY,**
> *MPH, Environmental Science PhD Candidate, Florida A&M University*

5. **Public Health and Environmental Justice:** Contributed to environmental justice by enhancing communication and decision-making for agencies managing water quality, aquaculture, and public health in the face of HAB threats. (Obj. 2)
6. **Addressing Emerging Issues:** Efforts in key regions, including the Northeast and Florida, to assess and respond to HAB threats, develop mitigation technologies (like DinoSHIELD), and integrate satellite data into decision-making. (Obj. 1 & 2)
7. **National Recognition:** The liaison's work has been recognized with the naming of a cyanobacteria species (***Sirenicapilaria stauglerae***) after them, celebrating their role in the HAB field. They were also featured in Florida Sea Grant's Women's History Month recognition.

> "...one such species – (Sirenicapilaria stauglerae) – has been named for her, in recognition of her contributions to the field. What an honor!"
>
> **— DR. PAUL DI GIACOMO,**
> *Secretary's Weekly Report, NOAA NESDIS STAR, Satellite Oceanography and Climatology Division*

IMPACTS: NOAA PARTNERS

1. **Broader Stakeholder Engagement:** Increased input from diverse sectors (fisheries, aquaculture, and environmental agencies), leading to better response strategies for HABs. (Obj. 2)
2. **Improved Industry Connections:** Improved collaboration with aquaculture and fisheries sectors for more effective HAB detection and management. (Obj. 1 & 2)
3. **Increased Distribution of Satellite Imagery:** Expanded availability of satellite imagery for bloom detection, helping agencies and industries make timely decisions. (Obj. 2)
4. **Continued Use of HAB Tools:** Ongoing demand for HAB forecasting tools and satellite products from NOAA partners. (Obj. 2)

FIGURE 2 SIRENICAPILARIA STAUGLERAE

IMPACTS: SEA GRANT PARTNERS

1. **Enhanced Communication:** Better coordination among Sea Grant programs and NOAA, strengthening overall capacity to manage HABs in regional areas. (Obj. 1 & 3)
2. **Increased Access to Tools:** Improved access to NOAA satellite data and tools, enhancing Sea Grant's capacity to meet the decision-making needs of their stakeholders. (Obj. 1, 2 & 3)
3. **Informed Decision-Making:** Increased use of HAB-related data products by Sea Grant partners for improved local decision-making regarding water quality and ecosystem health. (Obj. 2 & 3)

> "By being able to show the adverse impacts of nutrient enrichment (via macroalgae blooms) we were more easily able to document the concerns, which made it easier to convince our local governments to do more – which gave them the support they needed to spend serious amounts of money on wastewater upgrades and stormwater retrofits. Your program has been VERY helpful for us here."
>
> **— DR. DAVID TOMASKO,**
> *Executive Director, Sarasota Bay Estuary Program*

OVERALL IMPACTS:

1. **Strengthened Collaboration:** Enhanced partnerships among federal, state, academic, and industry stakeholders, fostering integrated HAB management strategies. (Obj. 1, 2 & 3)
2. **Improved Tools & Technology:** Advancements in satellite applications and forecasting tools, facilitating better detection and mitigation of HABs. (Obj. 2)
3. **Scientific Advancements:** Contributed to advancing the understanding of HABs. Initiatives like the Red Tide Communications Plan and the Blue-Green Algae Symposium helped refine scientific strategies for addressing blooms. (Obj. 1 & 2)
4. **Resilient HAB Management:** Improved HAB forecasting systems and early-warning capabilities contributing to industry resilience (e.g., fisheries, tourism). (Obj. 2)

5. Better Preparedness & Response: Collaborations led to successful responses to HAB events (e.g., the August 2024 early warning system in Connecticut) and improved coastal water quality monitoring. (Obj. 1 & 2)

TECHNICAL & PEER-REVIEWED PUBLICATIONS: (17)

Contributed to nine Regional Vignettes prepared by the Interagency Working Group for HABs and Hypoxia Research and Control Act for the next National assessment due to Congress in 2025.

Krimsky, L.S., Staugler, E.A., Laughinghouse IV, H.D. and Hazell. J. (2024). *Florida Sea Grant symposia promotes collaboration among harmful algal bloom stakeholders*. Oceanography, https://doi.org/10.5670/oceanog.2024.209.

Krimsky, L.S. and Staugler, E. (2023). State of the Science for Cyanobacterial Blooms in Florida: Produced from the 2023 Blue-Green Algae State of the Science Symposium II. Gainesville, Fla.: Florida Sea Grant College Program.

Staugler, E.A., Stumpf, R.P., Tomlinson, M.C., Wakefield, K., Allen, M., Egerton, T., Musick, S., and Wazniak, C. (2023). Applying novel techniques to assess and forecast harmful algal blooms in Chesapeake Bay to protect fisheries, aquaculture and human health, workshop report. Gainesville, Fla.: Florida Sea Grant College Program.

Florida Sea Grant (2021). Project Implementation Plan NOAA Harmful Algal Bloom Liaison Project 2021-2025. Gainesville, Fla.: SGR-138.

Staugler, E.A., Simoniello, C., & Monaghan, P. (2021). Insights from natural resources and public health professionals on key elements of red tide messaging and modes of communication. Gainesville, Fla.: Florida Sea Grant College Program. SGR-144.

Staugler, E.A., Simoniello, C., & Monaghan, P. (2021). Insights from tourism, media, small business, hospitality industry and public information officer professionals on key elements of red tide messaging and modes of communication. Gainesville, Fla.: Florida Sea Grant College Program. SGR-145.

Staugler, E.A., Simoniello, C., & Monaghan, P. (2021). Insights from the public on key elements of red tide messaging and modes of communication. Gainesville, Fla.: Florida Sea Grant College Program. SGR-146.

Krimsky, L.S., Staugler, E.A, Simoniello, C., Montes, N., Monaghan, P. & Hecker, F. (2021). Development of a red tide communications plan for Florida: Final report. Gainesville, Fla.: Florida Sea Grant College Program. SGR-148.

> Great work Betty and Team! ESP must have been flowing as the report and its upcoming release of findings was highlighted as part of our [Chesapeake Bay Program] CBP Criteria Assessment Protocol Workgroup meeting this morning. Interests with criteria setting and assessment continue, and we could possibly use some deeper diving into topics that touched those bases with this WG."
>
> **— DR. PETER TANGO,**
> *Chesapeake Bay Monitoring Coordinator, USGS*

OUTREACH/TRAINING PRODUCTS: (14)

Staugler, E.A. 2024. Summary of Liaison Engagement in the Northeast, Chesapeake Bay, Florida, and Nation (4 individual summaries).

NCCOS. 2024. DinoSHIELD: A Natural Approach to Control Red Tide August 2024 Workshop Series: Summary of Actionable Feedback.

USACE. 2024. DinoSHIELD outreach video. This video highlights the partnership and different expertise within the project team. The liaison discussed Sea Grant's role and the importance of local stakeholder engagement in the acceptance and widespread adoption of the DinoSHIELD technology.

> Undoubtedly, Betty was the glue that held these workshops together. She was an expert facilitator and a HAB subject matter expert. Most importantly, Betty is a trusted member of the Florida community. The success of these workshops would not have been possible without Betty as the HAB Liaison."
>
> **— DR. KARI ST. LAURENT,**
> *Chief, HAB-Forecasting Branch, NCCOS*

Staugler, E.A. 2024. Harmful Algal Bloom Science – Sea Grant Tip Sheet for Extension Programs, Gainesville, Fla.: Florida Sea Grant College Program.

Staugler, E.A., Tomlinson, M.H., Trenanes, J., Vegman, V. 2024. CoastWatch HABs module Part 2, College Park, MD: NOAA CoastWatch Program. Lecture available as audio-recorded PowerPoint files, video, or transcript.

Staugler, E.A. 2023. CoastWatch Intro to HABs module College Park, MD: NOAA CoastWatch Program. Lecture available as audio-recorded PowerPoint files, video, or transcript.

Rose, K. and Staugler, E. 2023. The Status of Red Tide Mitigation & Control Research Gainesville, Fla.: Florida Sea Grant College Program. (Blog)

Staugler, E.A. 2022. HAB Liaison webpage. Florida Sea Grant.

Wilson, C., Robinson, D., Abecassis, M. Vogel, R., Tomlinson, M., Vanderwoude, A., Staugler, E., Wegman, V. 2022. CoastWatch Water Quality module College Park, MD: NOAA CoastWatch Program. Lecture available as audio-recorded PowerPoint files, video, or transcript.

Staugler, E. 2022. New Tool for Assessing Florida Red Tide Bloom Severity Gainesville, Fla.: Florida Sea Grant College Program. (Blog)

Staugler, E. 2022. New Methods for Quantifying Spatial Extent of Cyanobacterial Blooms in the U.S. Across Different Geographic Scales Gainesville, Fla.: Florida Sea Grant College Program. (Blog)

SELECTED PRESENTATIONS: (44)

Staugler, E.A. 2024. National Sea Grant Program, Special Session: Meet the Funders: A Quick Tour of Federal Funding Programs for HAB Science and Management at U.S Symposium for Harmful Algae, Portland, Maine, October 29, 2024 (Speaker/Panelist)

Staugler, E.A. 2024. Nutrients and HABs: Issues and Actions Across Different Regions of the Country – Plenary at 2024 Understanding Algal Blooms State of the Science Conference, Ohio Sea Grant and Stone Laboratory, Toledo, Ohio and online, September 4, 2024

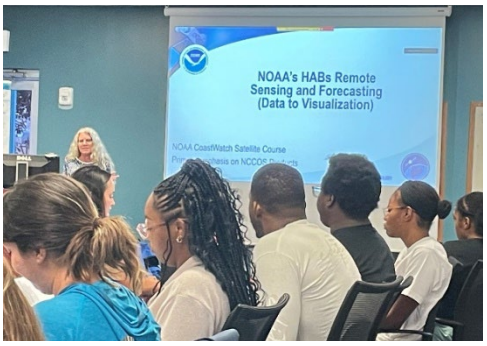

FIGURE 3 NOAA CCME PRESENTATION

Tomlinson, M.C., Staugler, E.A., Maucher Fuquay, J., Rene, N.H., Wazniak, C., Stumpf, R.P., Pokrzywinski, K. 2024. Monitoring Harmful Algal Blooms, improving resolution through remote sensing and community scientists at Chesapeake Community Research Symposium, Annapolis, Maryland and online, June 10-12, 2024

Sherman J., Tzortziou, M., Goes, J., Abecassis, M., Staugler, E., Lance, V. 2024. Actionable satellite water quality data products in LIS for improved management and societal benefits, 2024 Long Island Sound Research Conference, Port Jefferson, NY, May 15, 2024

Staugler, E. and Tomlinson, M. 2023. CoastWatch lecture on HAB satellite applications, (Virtual), February 8, 2023

Staugler, E. 2023. Sea Grant Investment in HABs, Water Resources Network Seminar, (Virtual) February 1, 2023

Wakefield, K. and Staugler E. 2023. Identifying HAB Assessment and Forecasting Needs: Pre-workshop Survey Summary at Applying novel techniques to assess and forecast HABs in Chesapeake Bay to protect fisheries, aquaculture and human health workshop, Gloucester, Virginia, January 18, 2023

PIER ID NUMBERS:

2019-2023 in Healthy Coastal Ecosystems Focus Area

29583 – Florida Sea Grant informs statewide response to harmful algal blooms

41972 – Great Minds Do Not Always Think Alike: Florida Sea Grant facilitates consensus on harmful algal bloom science in Florida

42483 – Florida Sea Grant's harmful algal bloom programming helps coastal stakeholders benefit from new research tools

LEVERAGED PROJECTS ($223,417)

Development of a red tide communications plan for Florida - $99,692

Nutrients and Red Tide in Florida State of the Science Symposium $123,785