

SCIENCE TO ACTION

in the Gulf of Mexico



FISCAL YEARS 2013 - 2018

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Following the Deepwater Horizon oil spill, Congress passed and the President signed the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf States Act of 2012 (RESTORE Act). The RESTORE Act directed the National Oceanic and Atmospheric Administration (NOAA) to establish a dedicated program to support research, observation, and monitoring in the Gulf of Mexico funded by a portion of the Clean Water Act penalties from the oil spill. This program has become known as the NOAA RESTORE Science Program and offers an opportunity to improve our understanding of the Gulf of Mexico ecosystem, including its living coastal and marine resources, and to use that knowledge to sustainably manage it. Working in partnership with the US Fish and Wildlife Service, NOAA has laid the foundation to do so by building a program that connects the capacity of the research community to the information needs of resource managers in the Gulf region.



Over our first six years, we realized that the Science Program would be most successful by investing in researcher and resource manager relationships and the co-production of science. It is this practice of researchers and end users of science working together in an iterative manner to co-produce science that will generate valuable findings and products and result in their use to inform decisions. By designing our funding opportunities around the needs we hear in our conversations with resource managers and other end users, using a competitive selection process, and working closely with our funded projects, we make sure our projects have an impact in the Gulf of Mexico.

Our first two sets of funded projects in 2015 and 2017 were just the beginning. In the fall of 2019, we will announce awards from our first long-term competition, which will provide up to ten years of continuous funding to teams to work on long-term trends in living coastal and marine resources and the processes that drive them. These long-term awards, and future ones like them, have the potential to be transformative by providing sustained funding to promising researcher and resource manager partnerships.

For us to transform the funds we steward into impactful science in the Gulf of Mexico, we need your continued support. We want to stay informed about resource management needs in the region and we need to hear about emerging issues researchers are finding. We want your input on what we are doing well and should keep doing and, more importantly, what we need to do better. We look forward to working with you to build on what we have collectively accomplished so far.

A handwritten signature in black ink that reads "Julien Lartigue".

Julien Lartigue, Ph.D.
Director, NOAA RESTORE Science Program

RESTORE SCIENCE PROGRAM



Image credit: NFWF

OUR CHARTER:

[NOAA](#) was authorized to establish and administer the RESTORE Science Program (Science Program), in consultation with the [US Fish and Wildlife Service](#), by the [RESTORE Act](#) (Public Law 112-141, Section 1604). Identified in the RESTORE Act as the Gulf Coast Ecosystem Restoration Science, Observation, Monitoring, and Technology Program, the Science Program's scope and priorities are captured in its [science plan](#).

OUR MISSION:

Carry out research, observation, and monitoring to support, to the maximum extent practicable, the long-term sustainability of the ecosystem, fish stocks, fish habitat, and the recreational, commercial, and charter-fishing industry in the Gulf of Mexico.

OUR VISION:

Long-term sustainability of the Gulf of Mexico ecosystem and the communities that depend on it.

OUR GOAL:

Support the science and coordination necessary for better understanding and management of the Gulf of Mexico ecosystem, which will lead to:

- Healthy, diverse, sustainable, and resilient estuarine, coastal, and marine habitats and living resources; and
- Resilient and adaptive coastal communities.

OUR OUTCOMES:

The Science Program seeks that:

- The Gulf of Mexico ecosystem be understood in an integrative, holistic manner; and
- Management of the Gulf of Mexico ecosystem, including its restoration, be guided by this ecosystem understanding.

AWARDS OVERVIEW

2015

The Science Program funded seven project teams in 2015 to assess the state of ecosystem modeling, indicators, and observing in the Gulf of Mexico. They have offered recommendations on next steps in these areas as well as practical findings. Each award was for 2 years.

THE PRIORITIES

- Inventory and assess ecosystem modeling
- Identify and evaluate ecosystem indicators
- Assess monitoring and observing needs

THE NUMBERS

- 37 proposals
- 7 awards totaling \$2.66 million
 - \$380,000 average per award
 - 40 investigators (37 Gulf-based)
- 21 Institutions
 - 10 Academic institutions
 - 4 Non-governmental organizations
 - 3 Federal agencies
 - 2 Private sector organizations
 - 2 State agencies

THE PROJECTS

Click on one of the project boxes below to LEARN MORE.

1

INDICATORS AND
ASSESSMENT
FRAMEWORK FOR
ECOSYSTEM SERVICES

2

CONCEPTUAL MODELS
AND INDICATORS
FOR FIVE COMMON
HABITATS

3

OBSERVING SYSTEMS
ASSESSMENT AND
ECOSYSTEM
MANAGEMENT

4

ASSESSING
ECOSYSTEM
MODELING

5

IDENTIFYING
ECOLOGICAL
HOTSPOTS

6

FISH SPAWNING
AGGREGATIONS

7

IMPACT OF THE
MISSISSIPPI RIVER ON
THE GULF OF MEXICO

AWARDS OVERVIEW

2017

The Science Program funded 15 project teams in 2017 to advance our knowledge of living coastal and marine resources or develop decision-support tools focused on living coastal and marine resources.

THE PRIORITIES

- Research on living coastal and marine resources, specifically, their movement, use of habitat, recruitment, food web dynamics, stressors, and connection between their restored habitat and surrounding habitat
- Decision-support tools to assist management of living coastal and marine resources

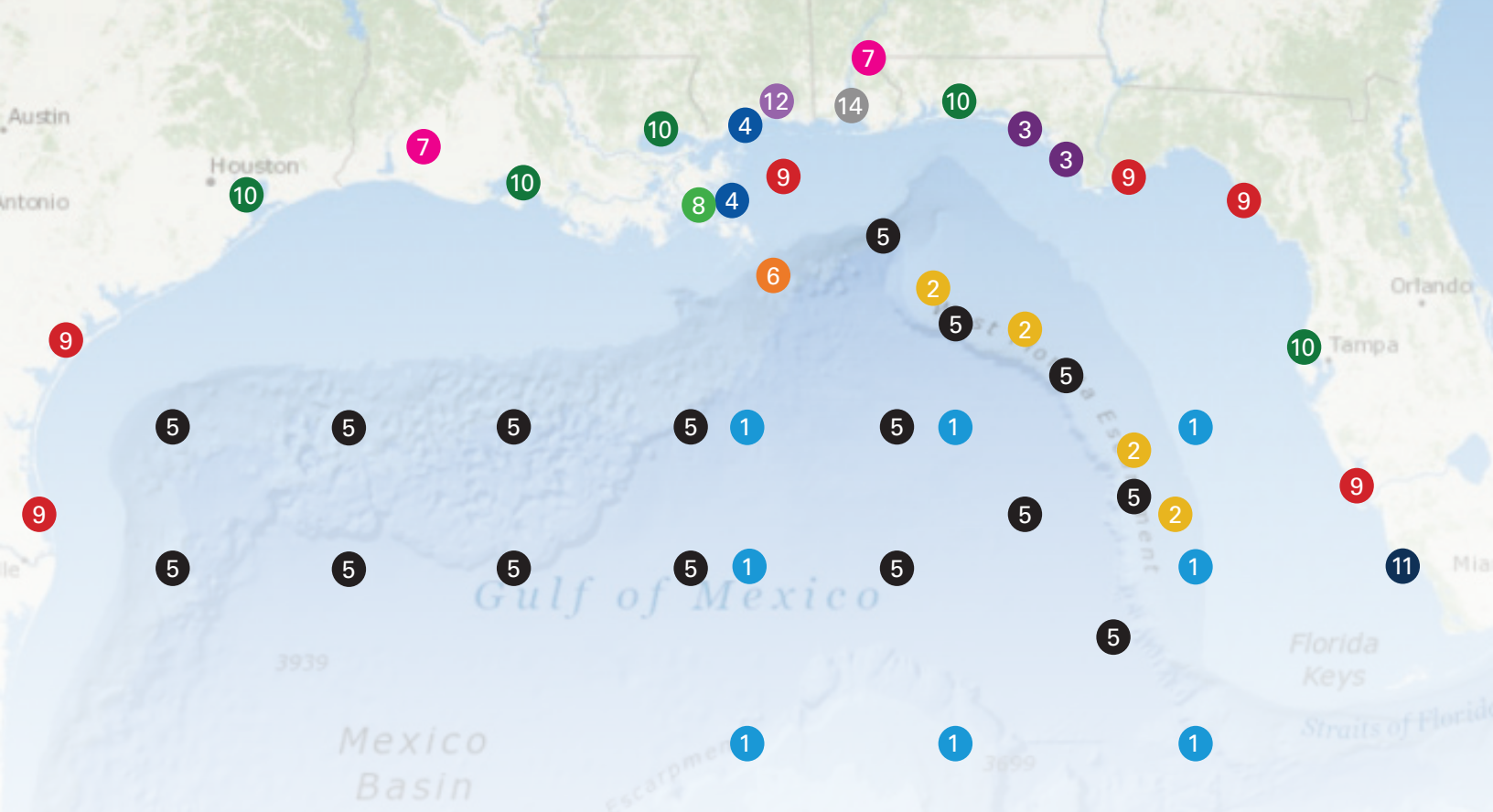
THE NUMBERS

- 132 proposals
 - Research: 92 proposals
 - Tools: 40 proposals
- 15 awards totaling \$16.74 million
 - 78 Investigators (58 Gulf-based)
- Research: 9 projects totaling \$12.22 million
 - \$1.36 million average per award
- Tools: 6 projects totaling \$4.52 million
 - \$754,000 average per award
- 37 Institutions
 - 28 Academic Institutions
 - 3 Non-governmental organizations
 - 3 Federal agencies
 - 3 State agencies

THE PROJECTS

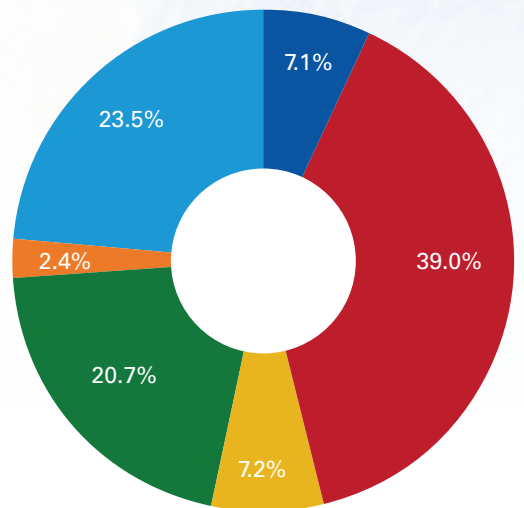
Click on one of the project boxes below to LEARN MORE.

1 RESEARCH BLUEFIN TUNA LARVAE	2 RESEARCH BRYDE'S WHALES	3 RESEARCH DOLPHIN TAGGING	4 RESEARCH OYSTER CONTAMINANTS
5 RESEARCH SARGASSUM	6 RESEARCH DEEPWATER CORALS	7 RESEARCH MIGRATORY BIRDS	8 RESEARCH MARSH FOOD WEBS
9 RESEARCH TURTLEGRASS AND NEKTON	10 TOOLS LIVING SHORELINE SITING	11 TOOLS LOCAL COASTAL PLANNING	12 TOOLS OYSTER MANAGEMENT PLANNING
13 TOOLS FISHERIES ECOSYSTEM MODELS	14 TOOLS MOBILE BAY MONITORING	15 TOOLS RED SNAPPER MANAGEMENT	

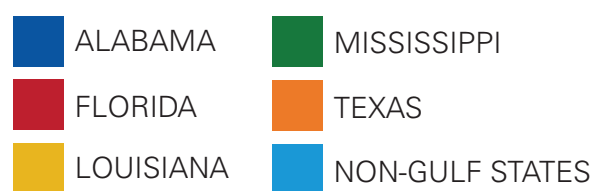


2017 PROJECT LOCATIONS - WHERE WE WORK

- 1 [Bluefin Tuna Larvae](#)
- 2 [Bryde's Whales](#)
- 3 [Dolphin Tagging](#)
- 4 [Oyster Contaminants](#)
- 5 [Sargassum](#)
- 6 [Deepwater Corals](#)
- 7 [Migratory Birds](#)
- 8 [Marsh Food Webs](#)
- 9 [Turtlegrass and Nekton](#)
- 10 [Living Shoreline Siting](#)
- 11 [Local Coastal Planning](#)
- 12 [Oyster Management Planning](#)
- 13 [Fisheries Ecosystem Models*](#)
- 14 [Mobile Bay Monitoring](#)
- 15 [Red Snapper Management*](#)



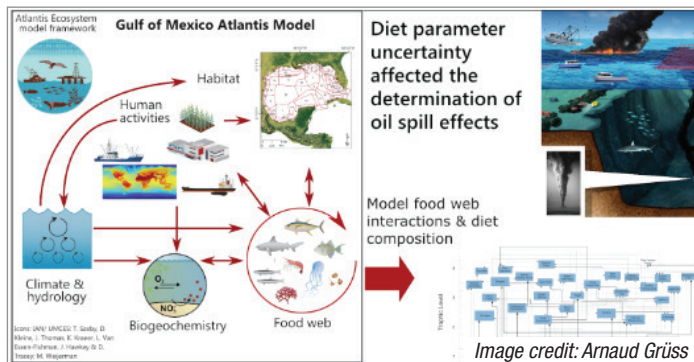
Percent total 2017 project funding by state



* This project is not conducting field work.



[Fish Spawning Aggregations](#) - An online data portal developed by the fishing sector, resource managers, and researchers that captures all available information on spawning aggregations for 28 reef fish species in the Gulf of Mexico has aided in monitoring and managing reef fish fisheries.



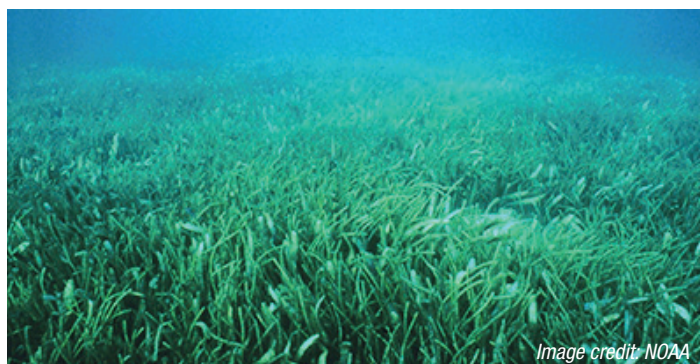
[Assessing Ecosystem Modeling](#) - An assessment of existing computer models for the Gulf of Mexico ecosystem evaluated how well current models addressed the needs of fisheries managers in the region and developed recommendations for how to build more accurate models in the future.



[Mobile Bay Monitoring](#) - The expansion of the Alabama Real-time Coastal Observing System (ARCOS) is ensuring its high-quality and system-wide information on weather and water conditions in Mobile Bay reaches those who need it through mymobilebay.com. With over 7000 unique users a month, upgrades to the system are improving the quality and quantity of information available to support coastal management, fisheries, commercial shipping, and recreational use in Mobile Bay.



[Bryde's Whales](#) - With the Gulf of Mexico Bryde's whale now designated as an endangered species, it is more important than ever to learn about the only baleen whale living year-round in the Gulf of Mexico. Discoveries about their feeding behavior and movement are informing the designation of critical habitat and the development of a recovery plan by resource managers.



[Conceptual Models and Indicators for Five Common Habitats](#) - Comprehensive recommendations on indicators for five common habitats in the northern Gulf of Mexico (salt marsh, mangrove, seagrass, oyster beds, and coral reefs) are being used as a valuable tool for damage assessment, restoration planning and evaluation, and determining the status of habitats critical to living coastal and marine resources.

SCIENCE PROGRAM BUDGET

The Science Program views investments in research and resource management partnerships as the best approach to accomplish our mission. By leveraging workforce support from within NOAA and other federal agencies, we strive to keep our program costs and administrative expenses low relative to the amount of funding we invest in science and its application. Since the Science Program began, we have spent approximately 89% of our funding on project awards.

Budget Measures in millions	Fiscal Year 2015	Fiscal Year 2016	Fiscal Year 2017	Fiscal Year 2018	Total
Program Costs (% of Total)	\$0.43 (13.9%)	\$0.37 (100%)	\$0.43 (6.9%)	\$0.56 (9.2%)	\$1.79 (11.3%)
- Administrative Expenses* (% of Total)	\$0.025 (0.8%)	\$0.026 (6.9%)	\$0.015 (0.2%)	\$0.019 (0.3%)	\$0.085 (0.54%)
Project Costs** (% of Total)	\$2.66 (86.1%)	\$0	\$5.78 (93.1%)	\$5.54 (90.8%)	\$13.98 (88.7%)
Total Costs	\$3.09	\$0.37	\$6.21	\$6.10	\$15.77
Gulf Region Costs (% of Total)	\$2.61 (84.4%)	\$0.27 (73.1%)	\$4.32 (69.7%)	\$4.78 (78.3%)	\$11.98 (76.0%)

* < 3% target per authorizing legislation for the lifespan of the Science Program

**Funding for cooperative agreements and intra- and inter-agency transfers for research and its application

Gulf Coast Restoration Trust Fund

The Science Program is funded by 2.5% of the Gulf Coast Restoration Trust Fund, established by the RESTORE Act, which comprises 80% of the Clean Water Act civil penalties recovered from parties responsible for the Deepwater Horizon oil spill. The Science Program's portion of the penalties should eventually amount to \$133 million after BP's last annual penalty payment in 2031. The Program also receives 25% of any interest accrued by the Trust Fund.

As of October 1, 2018, the Science Program's portion of the Trust Fund was \$41.561 million, of which \$34.975 million was penalties and \$6.586 million was interest earned. Through fiscal year (FY) 2018, the Trust Fund disbursed \$16.445 million to NOAA (of which \$15.766 million was expended) leaving a balance of \$25.116 million in the Trust Fund for the Science Program.

SCIENCE PROGRAM PERFORMANCE

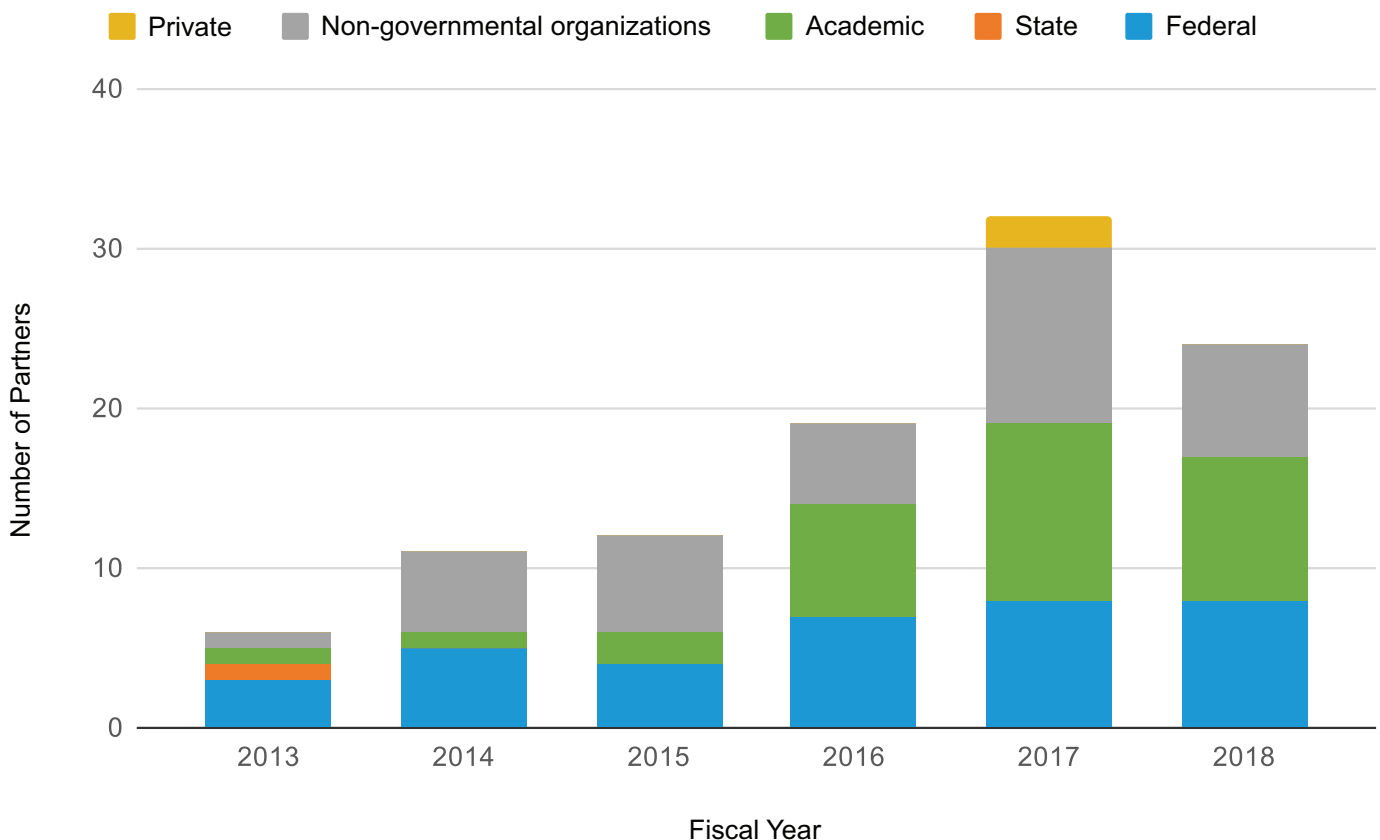
To assess whether we are accomplishing our mission and making progress towards the Science Program's long-term outcomes, the Science Program has developed a performance management plan and a suite of performance metrics. These metrics measure several outputs (e.g., sharing of our research findings and products) and outcomes (e.g., use of our research findings and products by decision makers) related to the research we support, its application, and our coordination with other programs. The following are examples of these output and outcome performance metrics.



Image credit: R Collini

JOINT ACTIVITIES

This graph shows the number of partners with which the Science Program conducted a joint activity each fiscal year. Joint activities may include funding competitions, workshops, funded-project collaborations, conference panels or sessions, and publications.



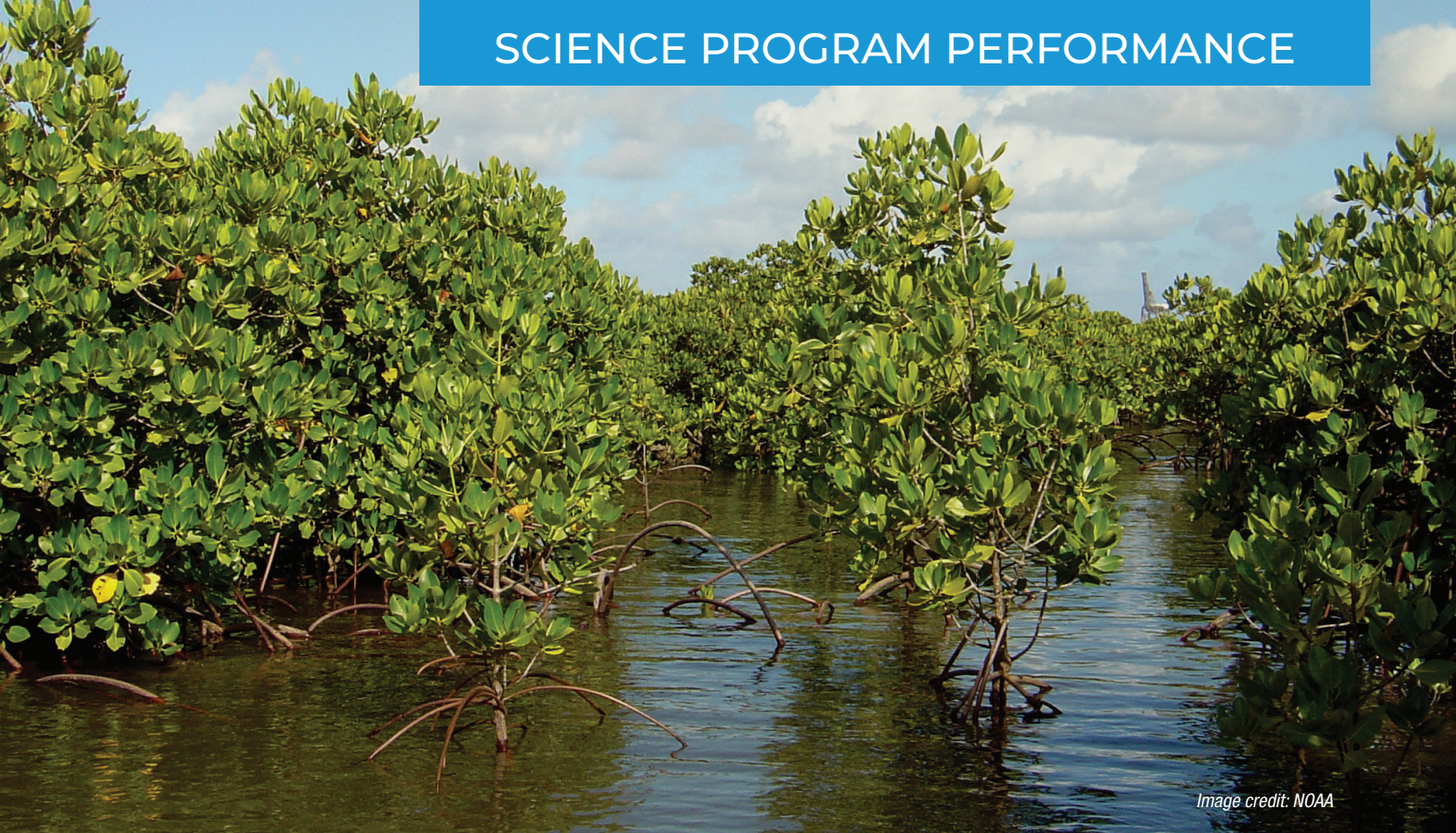
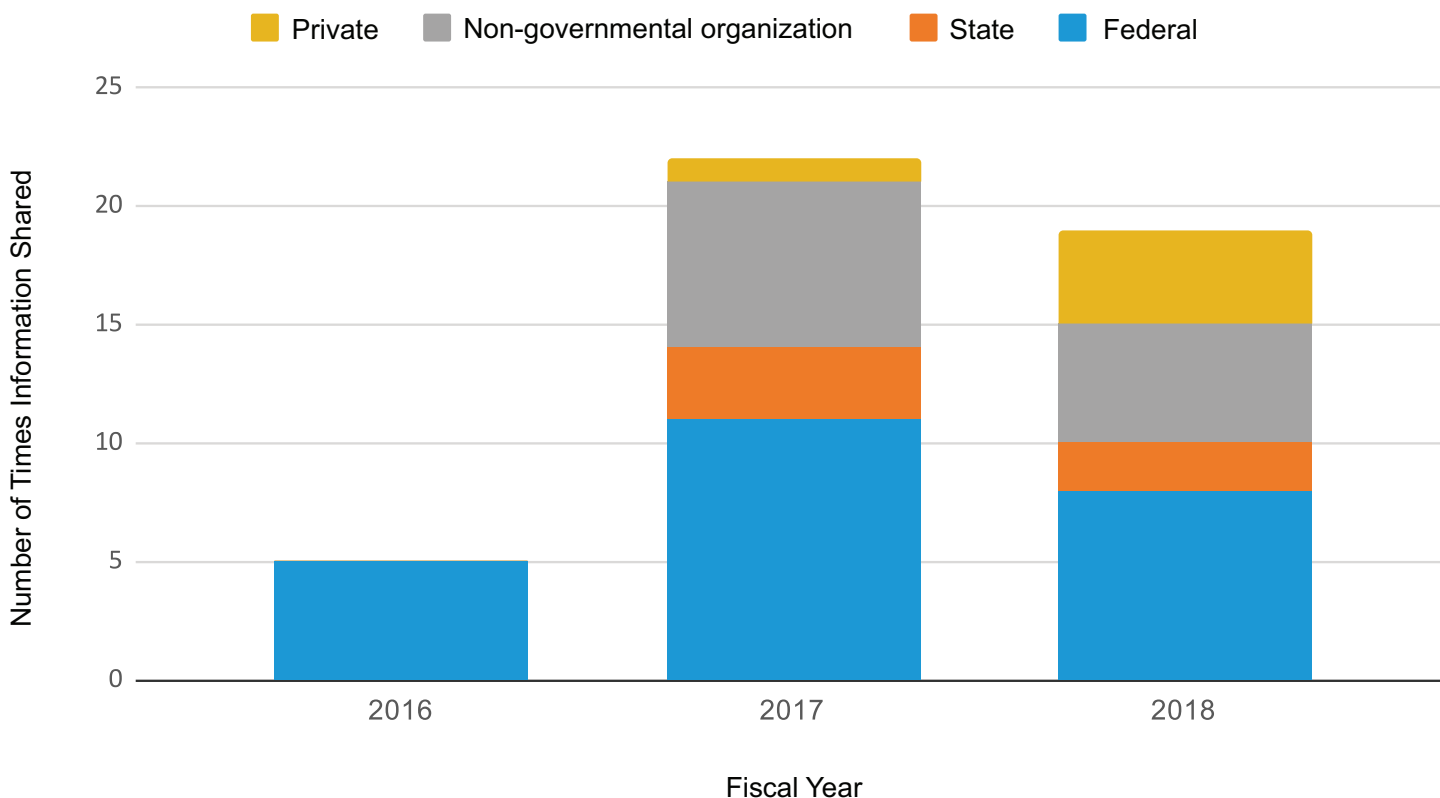


Image credit: NOAA

OUTREACH

This graph shows the number of times information from Science Program supported projects has been shared with end users since the first awards in 2015. The project teams share information such as research findings or products (e.g., data visualizations) to meet the needs of resource managers and others who need information to make informed decisions about natural resources in the Gulf of Mexico.





MANAGEMENT ACTION OUTCOMES

This outcome measures the number of local, state, federal, or regional strategies, plans, regulations, policies, laws, or funding initiatives addressing Gulf of Mexico ecosystem science or management that were changed or adopted after Science Program-funded research was taken into consideration.

National Academies' Gulf Research Program funding opportunity on coupled human and natural systems

- The lead investigator from the Science Program's 2015 project, [Impact of the Mississippi River on the Gulf of Mexico](#), was a member of the committee that authored the report from the National Academies titled [Understanding the Long-Term Evolution of the Coupled Natural-Human Coastal System](#). The study drew information from many sources including the investigator's work supported by the Science Program, which investigated the influence of the Mississippi River and its delta on the oceanography, ecology, and economy of the Gulf of Mexico. Ultimately, the study informed a funding opportunity released by the National Academies' Gulf Research Program in 2019 that focused on advancing understanding of coastal ecosystem function and dynamics in the coupled natural-human system of the Gulf Coast.

Boundary Expansion of the Flower Garden Banks National Marine Sanctuary

- The Science Program's 2015 project on [Observing Systems Assessment and Ecosystem Management](#) is visualizing information on ocean circulation and the movement of water from the nearshore to the offshore and this information is feeding into considerations of boundary expansion.
- The Science Program's 2017 project on [Deepwater Corals](#) is producing information on the connectivity of deep and mesophotic coral communities in the northern Gulf of Mexico and this information is also feeding into considerations of boundary expansion.

RAISING THE PROFILE

OF SCIENCE TO ACTION



A Science Program lead session at the 2018 National Conference on Ecosystem Restoration (NCER) included four lead principal investigators funded by the Science Program (left to right: Renee Collini, Mississippi State University; Ruth Carmichael, Dauphin Island Sea Lab; Kelly Darnell, University of Southern Mississippi; Kathy Goodin, NatureServe).

Science Program personnel and funded investigators participate in regional and national conferences with the goal of building productive relationships between researchers and resource managers, sharing lessons learned on how to co-produce science, and raising awareness of the need for science that meets the needs of decision makers within the Gulf of Mexico region. Conference sessions hosted by the Science Program include:

RESTORE AMERICA'S ESTUARIES AND THE COASTAL SOCIETY 2016

- [Linking Science and Management in the Gulf of Mexico in the Wake of the Deepwater Horizon Oil Spill](#)

GULF OF MEXICO OIL SPILL & ECOSYSTEM SCIENCE CONFERENCE 2017

- Use of Ecological and Socioeconomic Indicators to Demonstrate Ecosystem Recovery

NATIONAL CONFERENCE ON ECOSYSTEM RESTORATION 2018

- Use of Ecological Expertise for Communicating Sound Management Advice

COORDINATION

The Science Program is committed to coordinating with other programs focused on science and its application in the Gulf of Mexico. The Science Program is required to do so in the RESTORE Act, has been encouraged to do so by stakeholders, and views it as necessary to achieve the program's desired long-term outcomes.

The Science Program chairs the Gulf of Mexico Restoration and Science Program Coordination Forum, which is comprised of programs that receive funding as a consequence of the Deepwater Horizon oil spill. Its members include the Florida RESTORE Act Centers of Excellence Program, Mississippi-Based RESTORE Act Center of Excellence, RESTORE Act Center of Excellence for Louisiana, Subsea Systems Institute (a Texas RESTORE Act Center of Excellence), Texas OneGulf Center of Excellence (a Texas RESTORE Act Center of Excellence), Gulf Coast Ecosystem Restoration Council, Gulf of Mexico Research Initiative, Gulf States Marine Fisheries Commission, National Academies' Gulf Research Program, National Fish and Wildlife Foundation's Gulf Environmental Benefit Fund, Natural Resources Damage Assessment for the Deepwater Horizon oil spill, and Treasury Department.

The Coordination Forum is a venue for programs to communicate with one another to avoid duplication of activities and promote joint activities that address shared issues such as data stewardship. Annually, the Coordination Forum publishes a funding opportunities calendar that consolidates planned funding opportunities across all the Deepwater Horizon programs, which helps applicants plan ahead.

The Science Program also coordinates with non-Deepwater Horizon programs that invest in science and its application in the Gulf of Mexico. The challenge of understanding the Gulf of Mexico ecosystem in an integrated manner and having the management of the ecosystem, including its restoration, guided by this understanding will only be met through coordinated action.





2019 AWARD COMPETITION

- Identify, track, understand, and predict trends and variability in living coastal and marine resources and the processes driving them among one or more of the following:
 - Multiple species
 - Weather events and climate
 - Economic activity
- Up to 6 awards
- Long-term awards (5 years plus a potential 5 year renewal)
- Approximately \$30 million available over ten years

2021 AWARD COMPETITION

- Approximately \$6.75 million anticipated to be awarded
- Short-term awards (2-3 years)
- Priorities to be announced

CO-PRODUCTION WORKSHOPS THROUGHOUT THE GULF STATES

Co-production is the practice of researchers and end users (e.g., resource managers) of science working together in an iterative manner to produce scientific knowledge, findings, methods, or products that are directly applicable to end users needs. In co-production, end user needs are incorporated when designing and implementing the research approach. Outputs from the research are applied by the end user in the near term and inform how they think about future challenges.

In 2019, the Science Program will host a pilot workshop to foster co-production practices among researchers and resource managers focused on the Gulf of Mexico. This workshop will bring people together to discuss best-practices and how the Science Program can effectively support co-production in the region. If the pilot workshop is successful, the Science Program will conduct a series of similar workshops throughout the Gulf Coast.

RESTORE SCIENCE PROGRAM TEAM

The NOAA RESTORE Science Program is a cross-NOAA program conducted in coordination with the US Fish and Wildlife Service. Within NOAA, the Science Program is administratively housed in the National Centers for Coastal Ocean Science (NCCOS) within NOAA's National Ocean Service (NOS). The Science Program receives guidance and oversight from an Executive Oversight Board comprised of senior leaders from the NOAA line offices and a US Fish and Wildlife representative. The NCCOS Director serves as the executive sponsor of the Science Program with oversight of daily operations and the Science Program works closely with NCCOS personnel on administrative and programmatic activities such as data stewardship, environmental compliance, and communications.

- Julien Lartigue, Director (julien.lartigue@noaa.gov)
- Frank Parker, Associate Director (frank.parker@noaa.gov)
- Caitlin Young, Science Coordinator (caitlin.young@noaa.gov)
- Becky Allee, Senior Advisor (detailee from NOAA/Office for Coastal Management) (becky.allee@noaa.gov)
- Kassie Ernst, Science Policy Fellow (National Academies' Gulf Research Program) (kathleen.ernst@noaa.gov)
- Pete Key (detailee from NOAA/NOS/NCCOS) (pete.key@noaa.gov)

NOAA/NOS/NCCOS Support:

- LaValle Brown, Budget Analyst
- Laura Golden and Jennifer Hinden, Grant Specialists
- Jessica Morgan, Scientific Data Coordinator
- Catherine Polk, Graphic & Web Designer
- Paula Whitfield, Environmental Compliance

John Tirpak, US Fish and Wildlife Service representative

Steve Thur, Executive Sponsor (Director, NOAA/NOS/NCCOS)

RESTORE Science Program Executive Oversight Board

- Gary Matlock (chair) (NOAA)
- Lisa Dipinto (NOAA/NOS)
- Jon Pennock (NOAA/Office of Oceanic and Atmospheric Research)
- Clay Porch (NOAA/National Marine Fisheries Service)
- Tom Cuff (NOAA/National Weather Service)
- Eric Kihn (NOAA/National Environmental Satellite, Data, and Information Service)
- Joni Lombardi (NOAA Finance)
- Kevin Reynolds (US Fish and Wildlife Service)

Technical monitors for the Science Program's 22 funded projects: Becky Allee, Dennis Apeti, Melissa Carle, Vicki Cornish, Scott Cross, Laura Engleby, Deborah Epperson, Kassie Ernst, Nick Farmer, John Froeschke, Janessy Frometa, Jeff Gleason, Grace Gray, Rebecca Green, Mandy Karnauskas, David Kidwell, Julien Lartigue, Jenny Litz, Shannon Martin, Liz McCoy, Cindy Meyer, Cheryl Morrison, Barbara Muhling, Kate Rose, Shay Viehman, Caitlin Young, and Barb Zoodsma

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It would not be possible for us to run our funding competitions without the assistance of the peer reviewers who volunteer their expertise and time to evaluate applications submitted to these competitions. Thank you to those who have answered our requests for assistance.

Many individuals were involved in establishing the Science Program and in its operation from fiscal year 2013 to 2018. It is important to recognize their contributions. These individuals include:

Becky Allee (former acting Director, RESTORE Science Program)

Russ Beard (former acting Director, RESTORE Science Program)

Mary Erickson (former Director, NOAA/NOS/NCCOS)

Shelby Walker (former acting Associate Director, RESTORE Science Program)

RESTORE Science Program Executive Oversight Board (former members): Jon Alexander, Gabriela Chavarria, Kim Darling, Steve Fine, Margarita Gregg, Ming Ji, Richard Merrick, Bonnie Ponwith, Paul Sandifer, Cisco Werner, and Dave Westerholm

Chauncey Kelly, Lois Schiffer, and Stephen Smith for legal counsel and financial guidance

Science Plan Working Group and Engagement Working Group members: Becky Allee, Barbara Ambrose, Susan Baker, Russ Beard, Liz Clarke, Scott Cross, Paula Davidson, Todd Davidson, Theresa Davenport, Mary Erickson, Steve Giordano, Roger Helm, Nicole Kurkowski, Julien Lartigue, Kristen Laursen, Alan Leonardi, Alan Lewitus, Doug Lipton, Rob Magnien, Shannon McArthur, Sarah Morrison, Tracy Rouleau, Angela Sallis, Sun Shan, and Shelby Walker

National Academies' Gulf Research Program Science Policy Fellows: Janessy Frometa, Liz McCoy, and Caitlin Young

NOAA Rotational Assignment Program and Other Detailees: Chris Clement, April Croxton, Jaclyn Daly-Fuchs, Pete Key, Dwayne Meadows, Sean Meehan, Kate Swails, and Natasha White

Gulf Coast Ecosystem Restoration Science Program Advisory Working Group: Joe Boyer, Cynthia Decker (Executive Director SAB), Chris D'Elia, Bob Dickey, Richard Dodge, Michael Donahue [Science Advisory Board (SAB liaison)], Yoko Furukawa, Scott Glenn, Jean May-Brett (SAB liaison), Tom E. Miller, Tom J. Miller, Dwayne Porter, Nancy Rabalais, Chris Reddy, Kurt Schnier, Christine Shepard, Pamela Yochem, Paul Zimba, Tony Chatwin, Jeff Rester, Pat Roscigno, Carrie Simmons, Maggie Walser, and Chuck Wilson

