

Healthy Ecosystems Grants 3 and Thriving Communities Grants 4

Key Dates and Information

Letter of Intent (LOI)

March 15, 2017: Online LOI submission opens (CLOSED)

April 6, 2017, 1:30-2:30 pm Eastern Time (ET): Optional informational webinar ([view recording](#))

~~May 3, 2017, 5:00 pm ET: LOIs due~~

May 5*, 2017, 5:00 pm ET: LOIs due (CLOSED)

[*Deadline extended due to earlier technical difficulties with grants application system]

An LOI is required for this funding opportunity.

Full Proposal

May 6, 2017: Online full proposal submission opens (*only* to applicants who submitted an LOI) (CLOSED)

June 28, 2017, 5:00 pm ET: Full proposals due (CLOSED)

Grant Type: Research-Practice

Grant Type Description

Research-practice grants aim to advance science and its application by (1) accelerating knowledge transfer from researchers to practitioners, thereby facilitating implementation; and/or (2) encouraging the use of practitioners' knowledge and lessons learned from experience to inform research. Proposed projects must be hypothesis-driven and seek to improve science and practice by bringing together researchers, practitioners, or other relevant perspectives.

[Download as PDF](#) to view all information about this funding opportunity as a PDF. (Please note that this is version 1.1 of the PDF issued to fix incorrect dates previously listed on p.3.)

Context: The National Academies of Sciences, Engineering, and Medicine produce expert consensus reports that identify research needs, opportunities, or challenges for advancing science and ensuring the application of science to address real-world problems. This funding opportunity seeks to advance concepts and opportunities outlined in two recent reports that are particularly relevant to the Gulf Research Program's (GRP) mission to enhance protection of human health and the environment. This RFA addresses two topics:

- **Integration of Monitoring and Evaluation into Environmental Restoration Projects to Improve Outcomes in the Gulf of Mexico** (Healthy Ecosystems Grants 3)
- **Improving Risk-Based Evaluations to Support a Public Health Response to the Next Oil Spill** (Thriving Communities Grants 4)

Please see below for more information about these topics and related reports.

Anticipated Total Amount for this Funding Opportunity: Approximately \$5 million is available

Award Announcement and Anticipated Project Start Date

Healthy Ecosystems Grants 3

Topic: Integration of Monitoring and Evaluation into Environmental Restoration Projects to Improve Outcomes in the Gulf Of Mexico

The Challenge: An estimated \$15-20 billion will be spent over the next several decades restoring ecosystems and natural resources in the northern Gulf of Mexico. This unprecedented level of investment brings an implicit demand for accountability and the expectation of successful restoration outcomes. Given the complexity of the Gulf environment, as well as the large scale and extended time frame of the restoration efforts, there is increasing consensus that monitoring is critical for assessing restoration progress and effectiveness.

Photo credit: NOAA

As outlined in the 2016 National Academies report [*Effective Monitoring to Evaluate Ecological Restoration in the Gulf of Mexico*](#), most environmental restoration projects are not sufficiently monitored to generate rigorous, decision-relevant, or publicly-available information. Consequently, there are significant uncertainties and knowledge gaps related to both species and habitat restoration. However, as

identified in the [report in brief](#), there are numerous benefits to monitoring restoration efforts, including:

- Assuring that restoration projects are implemented and initially functioning as designed.
- Assessing whether restoration goals are being met.
- Informing restoration management.
- Improving the design of future restoration efforts.

The paucity of restoration monitoring poses challenges for scientists and decision makers to identify relevant indicators of effective restoration and to determine how best to monitor the indicators and for how long.

Additionally, there are needs for monitoring approaches and metrics that allow researchers and practitioners, such as environmental engineers and restoration contractors, to compare data at scales beyond the single project level. Monitoring metrics and data could also inform ecosystem model development, enhance understanding of large-scale ecological processes, and support decisions of where and how to implement restoration projects to achieve the largest gains. Such approaches are essential for broader efforts to restore large ecosystem functions (e.g., ecosystem functions that tidal wetlands and barrier islands can provide).

This funding opportunity seeks to address the challenges described above by supporting projects that develop and test new approaches, technologies, or methods for monitoring or evaluating restoration projects and/or their design so that future restoration plans and efforts are more likely to be effective.

What we are looking for: Below are examples of some types of activities needed to enhance effectiveness of future restoration plans and efforts. This list is not comprehensive; it is meant to illustrate the range of opportunities that may be supported by these grants.

- **Addressing knowledge gaps to improve habitat and species restoration planning and outcomes.** To be effective, restoration plans need to account for variation in ecosystem processes, resources, and stressors that are likely to affect restoration objectives for the target species or habitats. Inadequate understanding of the impacts of such environmental variation leads to uncertainties in the planning of projects and to unfavorable outcomes.
- **Identifying common variables among restoration objectives to inform overall knowledge of ecosystem functioning.** Given the scope and scale of proposed restoration efforts, there is an opportunity to integrate data and information

among projects with similar objectives to build upon the current understanding of larger scale ecosystem functions.

- **Developing transferable approaches and common monitoring strategies to guide the restoration of ecological processes and increase utility to decision makers.** Restoration projects that address interconnected resources such as fisheries and habitats provide opportunities for researchers to design approaches and strategies that work to link projects and thus increase the scale of usefulness across local and regional ecological processes.
- **Exploring the effects of ecological restoration on socio-economic conditions and optimization of ecosystem service benefits.** The sizable investments into environmental restoration are expected to benefit the Gulf region in a number of ways, including the restoration of ecosystem goods and services and related economic effects. Identifying and measuring these effects can help inform future restoration planning and priority setting as well as help with ecosystem services valuation at local and regional scales.

To be considered responsive to this RFA topic, proposed projects should:

- Clearly describe the specific problem and/or monitoring issue and how the proposed work will address it.
- Clearly describe how the proposed project will bring together relevant expertise to move monitoring findings into practice.
- Clearly describe any metrics or specific analyses that will be developed and used in the project and how they are appropriate for the activity.
- Clearly articulate how the proposed project will accelerate knowledge transfer from researchers to practitioners in order to facilitate improved implementation or encourage the use of practitioners' knowledge and lessons learned from experience to inform research.

We will not consider funding for:

- Activities or programs that are simply a continuation of efforts already underway.
- Restoration projects.

Thriving Communities Grants 4

Topic: Improving Risk-Based Evaluations to Support a Public Health Response to the Next Oil Spill

The Challenge: Risk-based evaluations are critical to public health decision making because they provide information about possible health risks in individuals or populations exposed to hazardous materials and situations. During major oil spills, such as the 2010 Deepwater Horizon disaster, federal and state regulators and

others make many decisions related to public health, including decisions about closing or opening fisheries and beaches; protecting oil spill clean-up workers and vulnerable populations; and determining the safety of air, water, and food. New approaches, tools, and technologies offer opportunities to improve the breadth and timeliness of information available for decisions about health and safety.

Photo credit: NOAA

The 2017 National Academies report [*Using 21st Century Science to Improve Risk-Related Evaluations*](#) reviews the substantial scientific and technological advances in exposure assessment, toxicology, and epidemiology that can improve hazard identification, exposure assessment, and risk characterization. New tools, technologies, and approaches can potentially increase the speed at which some information can be collected and expand the scope of the data available for risk-based evaluations that are critical to public health decisions. Advances include new sensor and sampling technologies, computational exposure tools, omics technologies, high-throughput in vitro assays, new animal models, targeted and non-targeted analyses, read-across approaches, and cheminformatics. These advances support new approaches to risk-based evaluations, including those that are applicable to questions about health and environmental risks arising from an oil spill. As described in the [report in brief](#), the new approaches are “based on biological pathways rather than observations in animal studies” and “focused on estimating or predicting exposures to multiple chemicals and stressors, characterizing human variability in those exposures, providing exposure data that can inform toxicity testing, and translating exposure between test systems and humans.” The report emphasizes that close collaborations among exposure scientists, toxicologists, epidemiologists, and others are needed to realize the full potential of these modern tools. Another critical challenge for applying 21st century science is interpreting and integrating the data from diverse technologies, data streams, and sources to address complex questions faced by public health practitioners.

This funding opportunity challenges applicants to improve the information available for decisions relevant to health and safety during oil spills by taking advantage of new technologies, data streams, and approaches. For example, oil spills release thousands of chemicals into the environment. These complex mixtures differ depending on the physical and chemical nature of the oil spilled, environmental conditions in which they are released, and use of mitigation agents, such as dispersants. The mixtures are further modified over time by weathering and

biodegradation. Risk-based evaluations are traditionally focused on single chemicals or small groups of chemicals, but new technologies are allowing researchers to characterize real-world, complex mixtures rapidly and set testing priorities for mixture components. Similarly, new approaches could help to fill gaps in exposure and toxicity data and related risk information by improving understanding of chemical fate, biological response, and factors that affect susceptibility. New methods and approaches are also enabling investigation into cumulative risk. Research includes how mixtures of chemicals that share a common mechanism or biological pathway might have synergistic toxicological effects, or how exposure to multiple chemical and nonchemical stressors (e.g., stress) act together to affect human health. Collaborations among scientist from different disciplines, oil spill and public health practitioners, and others will be essential to using these new approaches to improve a public health response to the next oil spill.

Preparedness for the next oil spill will also benefit from developing approaches for communicating about the strengths and limitations of the new approaches in a transparent and understandable way. For example, interactions between researchers and those involved with decision making and implementation will help to ensure that the decision makers understand the implications of the findings from the new approaches and also help the researchers understand what information is needed to address the concerns of populations most likely to be affected by oil spills.

What we are looking for: Below are a few examples of the types of innovations and collaborations that might be needed to advance this work. This list is not comprehensive; it is meant to illustrate the range of opportunities that may be supported by these grants.

- **Interdisciplinary research to characterize toxicity of exposures to complex mixtures.** Responses could include projects that connect exposure and toxicity research, such that each component of research informs the other. For example, proposed projects might examine how new analytical techniques can be used to better define the chemical space of mixtures associated with oil spills and to design toxicity-testing systems that cover the necessary biological space (i.e., neurological, reproductive, developmental, and other relevant endpoints) given the chemical exposure. This might also include epidemiological studies of oil exposed workers or other populations combined with exposure characterization and toxicology studies to understand biomarkers of both exposure and effect.

- **Interdisciplinary research to improve understanding of the effects of weathering of complex mixtures on toxicity and exposure.** Responses could include projects to connect toxicology and exposure science research. For example, proposed projects might examine how mesocosm approaches can use new analytic approaches to better understand the effects of weathering and to define the biological space that a toxicity testing system would need to cover given the various chemical exposures.
- **Developing models to maximize the use of observational or experimental data.** Having detailed information on each component in a complex and changing mixture during and after an oil spill is an unrealistic expectation. Thus, research is needed to develop and test models that can help predict exposure and toxicity. For example, proposed projects might examine how data from environmental fate and transport experiments can be used to develop better models for predicting exposure to oil spill components or possible degradation products.
- **Understanding the influence of multiple chemical and nonchemical exposures.** Adverse effects of a disease can result from the interaction of multiple components or pathways. How exposures from oil spills affect communities that are also exposed to nonchemical stressors is important in understanding their cumulative risks. For example, proposed projects might focus on identifying biomarkers of susceptibility and common biological pathways that are perturbed by nonchemical stressors, such as poor nutrition, and by exposures to oil-spill components, their degradation products, or remediation chemicals, such as dispersants.
- **Improving communications about findings from new approaches to toxicology, exposure science, and epidemiology and their use to inform public health decisions.** For example, proposed projects could include research, training, or education modules that provide risk managers, oil spill practitioners, and public health decision makers with access to information about new technologies and their capabilities. Other efforts could improve understanding of perception of risks during oil spills and the types of information that can enhance communications about public health decisions during oil spills.

To be considered responsive to this RFA, proposed projects should:

- Involve collaborations among researchers from different scientific disciplines (e.g., toxicology, exposure science, epidemiology) and practitioners (e.g., risk managers, public health practitioners, oil spill practitioners) that will improve the science of risk-based evaluations and its application to address complex

questions faced by public health practitioners about health and environmental risks that arise during oil spills.

- Clearly articulate how the proposed project will advance the science of risk-related evaluations before and during oil spills and further the application of that science to improve the information available for health and safety decisions during the next major oil spill.
- Clearly articulate how the proposed project will accelerate knowledge transfer from researchers to practitioners in order to facilitate improved implementation or encourage the use of practitioners' knowledge and lessons learned from experience to inform research.
- Explore approaches that help to indicate the most significant risks from a spill (i.e., it is not necessary to characterize fully the chemical nature and toxicity of all chemicals involved in a spill; thus approaches that facilitate prioritization are needed).

We will not consider funding for:

- Activities or programs that are simply a continuation of efforts already underway.