

NGI Science, Education, and Research Management Plan



1.0 Purpose

This document discusses how the Northern Gulf Institute (NGI or “the Institute”) develops a program of scientific inquiry that supports the needs of the National Oceanographic and Atmospheric Administration (NOAA) line offices. At the same time, it describes how NGI remains sufficiently nimble to expand its research agenda as new intellectual and partnership opportunities arise. This document defines the Institute’s proposal development and evaluation process and establishes a mechanism for additional expansion of the Institute’s intellectual pursuits with NOAA, as well as with other governmental and non-governmental organizations. The primary guiding documents for the Institute are the NGI Strategic and Implementation Plans. This document supplements them and points researchers to other pertinent documents that identify regional research, operational and educational needs.

2.0 Background

NOAA established the Northern Gulf Institute in 2006 as a cooperative institute (CI) with five collaborating academic institutions: Mississippi State University (lead), University of Southern Mississippi, Louisiana State University, Florida State University, and Dauphin Island Sea Lab. NOAA’s Office of Oceanic and Atmospheric Research (OAR) provides the research funding to support significant NOAA interaction with the NGI and to increase NOAA research activities in the northern Gulf of Mexico region in one or more of the NGI’s four thematic areas: (1) Ecosystem Management, (2) Climate Change and Climate Variability Effects on Regional Ecosystems, (3) Coastal Hazards and (4) Geospatial Data Integration and Visualization in Environmental Science.

NOAA Cooperative Institutes¹ are positioned in an essential middle ground between NOAA labs and Sea Grant programs² (for example see www.masgc.org). Not burdened with career commitments to federal scientists, CIs can be more nimble than NOAA labs in adjusting programs and recruiting necessary expertise from across the universities involved. When compared to Sea Grant Programs, CIs are positioned to address research issues and topics that require a longer-term, sustained approach at the regional and national level. Sea Grant programs address national priorities through a four year strategic planning commitment at the state and local levels, using a research program integrated with broad constituent driven extension, outreach and education programs. To coordinate these different approaches and to ensure that we minimize duplication, the NGI and the Mississippi-Alabama Sea Grant established a memorandum of agreement to cooperate in planning and research. In addition, the directors of the Louisiana and Florida Sea Grant organizations have agreed to serve on the NGI Advisory Council.

CIs closely connect to the NOAA research program through the NOAA labs and research centers. CIs can thus provide highly complementary and synergistic research programs that capitalize on the strength of academia working in collaboration with NOAA scientists. NGI occupies a unique place in the overall NOAA CI organization being composed of a consortium of universities and NOAA scientists. Funding is split at approximately 75% for the university

¹ www.nrc.noaa.gov/ci/

² www.masgc.org

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led projects and 25% for NOAA led research. As NGI matures, the collaboration between these funding sectors has increased.

The five NGI research institutions bring world-class depth and breadth to the NGI's scientific research. NGI scientists and universities are competitive in most any environment, including their ability to compete for NOAA funding. It follows then that NGI exists primarily to improve the linkage of this group of world-class scientists and universities with NOAA's mission-oriented research and to form research teams more capable than from any one of our institutions alone. The benefits to NOAA of a Memorandum of Agreement (MOA) with the NGI include preferred access to and, to some extent, more direct influence over the direction of the research activity in each of the member institutions. It is advantageous for NGI to build better exposure to the NOAA mission needs among its members so that our individual institutions and NOAA can enhance the potential of the NGI. The NGI clearly adds value to high quality work at our individual institutions through several mechanisms that the MOA with NOAA facilitates:

- The NOAA/NGI MOA lowers institutional and disciplinary barriers to collaborative and/or mission-oriented research at both NOAA and in our member institutions;
- The administrative structure of NGI in itself, and as part of the CI community, provides a conduit to NOAA and helps investigators navigate the agency;
- The NOAA/NGI MOA streamlines funding processes and facilitates flexibility and fast response, all of which are a huge advantage to our individual institutions, NGI, and NOAA.
- NGI provides direct, visible added value to NOAA by:
 - Leveraging other funding sources (NASA, EPA, USGS, DOD, USDA, DOI, etc.) to facilitate a broad, vigorous research agenda focused on the northern Gulf.
 - Taking a major role in organizing and executing government and legislative relations to support the NOAA agenda.
 - Providing NOAA with strong education and outreach components complementary to Sea Grant.
 - Connecting NGI scientists, post-docs and graduate students to NOAA and NOAA's mission, enhancing scientific interaction as well as providing for future NOAA recruiting opportunities.

3.0 Objectives. The specific objectives, as listed in the NOAA/NGI Memorandum of Agreement are:

- Provide sustained attention to scientific, technical and systems integration with NOAA and among the NGI members.
- Develop, maintain and refine a NGI research and transition program that fills priority gaps or reduces important limitations in current regional awareness, understanding and decision support among upland-watershed systems and practices, coastal transition areas and resources, coastal-ocean waters, and coastal hazards. NGI maintains a link on www.NorthernGulfInstitute.org to important documentation concerning the research and operational needs of the northern Gulf of Mexico. Principal among these (but not necessarily limited to these) are the Gulf of Mexico

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Alliance Governors' Action Plan 2³, the Gulf Coast Services Center (NOAA) Needs Assessment⁴ and the Gulf of Mexico Research Plan⁵, the last sponsored by the national and Gulf of Mexico Sea Grant College Programs. The Sea Grant: *Priority Gulf of Mexico Research Needs Analysis I* was released in 2008.

- Develop a steadily increasing interdependent research and development program that takes advantage of each of NGI's core institutional strengths, to support its priority research themes in the Northern Gulf: (1) Ecosystem Management, (2) Geospatial Data Integration and Visualization, (3) Climate Change and Climate Variability Effects on Regional Ecosystems, and (4) Coastal Hazards. Through the NGI Web Site, Research Plans, Annual Performance Reports, NGI Workshops, and other means, NGI documents its contributions to NOAA's five major mission goals: (1) Ecosystem - Protect, Restore, and Manage Use of Coastal and Ocean Resources through Ecosystem-Based Management, (2) Climate – Understand Climate Variability and Change to Enhance Society's Ability to Plan and Response, (3) Weather and Water – Serve Society's Needs for Weather and Water Information, (4) Commerce and Transportation – Support the Nation's Commerce with Information for Safe, Efficient and Environmentally Sound Transportation, and (5) Mission Support – Provide Critical Support for NOAA's Mission.
- Provide quality research and technology access to NOAA and NOAA-led NGI projects via direct access to the research and outreach faculties at the NGI university campuses and Stennis Space Center.
- Develop graduate-level education opportunities, NOAA career contacts, and scientific research experience to students from all relevant disciplines.
- Leverage NOAA investments in the NGI by fostering collaboration within and among NGI member institutions, with NOAA Line Offices, with federal, state and non-government organizations in the region, and with selected cooperative research and development activities involving the private sector.

4.0 Guiding Principles and Research Themes

The two primary guiding principles for NGI are:

- Support the best innovative science and technology research that will benefit the northern Gulf of Mexico region.
- Advance NOAA's mission to understand and predict changes in Earth's environment and provide environmental stewardship of the Nation.

The research themes of the NGI, as established in the original response to the federal funding opportunity are:

Ecosystem Management: Research in this theme focuses on promoting sustainable coastal development, facilitating community resiliency, and enabling an ecosystem approach to

³ http://www2.nos.noaa.gov/gomex/past_events/welcome.html

⁴ [http://www.csc.noaa.gov/needsassessments/\(Gulf\)%20GULF_NEEDS_FINAL.pdf](http://www.csc.noaa.gov/needsassessments/(Gulf)%20GULF_NEEDS_FINAL.pdf)

⁵ <http://masgc.org/gmrp/index.htm>

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management. These foci are based upon enhanced scientific understanding of the interconnections between the marine ecosystem and the adjacent watershed including their human health and resource stewardship implications.

Geospatial data integration and visualization in environmental science: This theme focuses on research on data integration techniques and geospatial technologies (GIS and remote-sensing), as well as the development of decision-support tools that enable improved regional ecosystem forecasting, ecosystem management and ecosystem policy decisions.

Climate Change and Climate Variability Effects on Regional Ecosystems: Research conducted under this theme focuses on climate change and climate variability effects upon marine ecosystems and the socioeconomic well-being of the region and the adjacent watershed as well as potential ecosystem effects upon climate processes.

Coastal Hazards: Research in this theme encompasses the physical and biological systems, as well as the biological and socio-economic dimensions, associated with coastal hazards.

The original planning for the CI was reflected in the draft MOA between NGI and NOAA that sets out this collection of themes of mutual interest. For NGI to continue to develop and evolve to the benefit of our institutions and NOAA partners, this science plan will continually need to be adjusted to align with NOAA's recently developed research plan. While the Institute does not anticipate significant deviations from the guiding principles and themes, additional funding from NOAA or other agencies may be sought by the Institute to perform research in broader areas than those defined by the NGI Themes at the discretion of the NGI Director and Fellows. The Institute anticipates addressing future research of the larger ecosystem and moving beyond the original coastal Gulf of Mexico and coastal watershed focus to a broader study of the watersheds and oceanic processes that influence the Northern Gulf of Mexico.

5.0 Education and Outreach

Alignment

The strategic identification and implementation of NGI education and outreach efforts align with NOAA's Education Strategic Plan 2009-2029, the NOAA-NGI Memorandum of Agreement (MOA), and the NGI Strategic and Implementation plans. Within these documents are other referenced sources for direction and alignment. Collaboration of educational efforts to ensure support of NOAA's Education Strategic Plan is a critical component of NGI education and outreach activities.

Two primary goals are outlined in NOAA's Education Strategic Plan are:

1. **Environmental Literacy** through Life-Long Formal & Informal Education and Outreach Opportunities in Ocean, Coastal, Great Lakes, Weather, and Climate Sciences to Encourage Stewardship and Increase Informed Decision Making
2. **Workforce Development** Reflecting the Diversity of the Nation Skilled in STEM and Other Disciplines Critical to NOAA's Mission

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Within these two NOAA Education Goals are specific outcomes that NGI education and outreach efforts support:

1. Environmental Literacy
 - Evaluate Education to improve the effectiveness of programs and products
 - Educators understand and use Ocean and Climate Literacy Principles
 - Educators, students, and public use inquiry-based learning (collect and use data)
 - NOAA serves as a catalyst and information source for life-long learners
 - Partners in science and resource management agencies contribute to enhancing environmental literacy
 - NOAA engages audiences by providing educational activities that are well coordinated, efficiently leveraged, and informed by NOAA sciences
2. Workforce Development
 - Career development through educators and scientists who are influential in guiding students in their education and career choices
 - NOAA's employees support programs and activities for students and teachers to learn about and explore NOAA science and stewardship
 - A diverse pool of students with degrees in science, technology, engineering, mathematics, and other fields critical to NOAA's mission connect to career paths at NOAA and related organizations

The NOAA-NGI MOA outlines the NGI Research Themes, NOAA's five Mission Goals, and specific focus areas for research, education, and outreach (previously detailed in this document). The NGI education and outreach team aligns our projects and activities with the precepts of the NGI Philosophy of Operations (NGI Proposal and Work Plan for Year-Four Funding FY 09).

These guiding precepts are:

- User Community Driven and Client Focused
- Transition Oriented
- Regional in Research Focus
- Closely aligned with the Needs and Resources of its Federal Partner NOAA

Purpose and General Activities

The purpose of NGI education and outreach efforts is to insure that the results of NGI research are appropriately transmitted to our target audiences. NGI has made a significant investment in education and outreach and, therefore, will engage in the following general activities:

- Communicate the impact of NGI science through the collaborative development of education and outreach activities and materials.
- Increase awareness about and promote research opportunities for NGI researchers, partners, and students that align with NOAA's research plans.

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- Identify, support, and fund graduate and undergraduate student education opportunities at NGI member institutions, creating the opportunity to educate students about NOAA's mission, NOAA's research and operations personnel, and increase the pool of workforce candidates for NOAA.
- Establish internships, fellowships, and student-oriented programs that facilitate student interactions with NOAA scientists.
- Leverage education and outreach efforts by taking advantage of existing programs and activities with our partners in the Northern Gulf of Mexico region.

Directives

The NGI Strategic Plan outlines six goals and accompanying strategies and objectives, with goals two and five focused directly on education and outreach and with goal six that has related components. These goals provide guidance for NGI education and outreach efforts with strategies defining specific areas of focus and measures of success. They are as follows:

Goal #2 – Regional education and outreach programs within the four NGI themes

Strategies:

- Regional education and outreach projects and activities aligned with the NGI Science Plan and the four research themes
- Students involved with NOAA and NGI Minority Fellowship programs
- Funding criteria that emphasizes student involvement in projects
- Funding criteria that emphasizes outreach activities for each project

Objectives:

- Develop and implement projects that include an outreach component or activity
- Develop and implement projects that involve students with NOAA and NGI Minority Fellowship programs
- Develop and implement speaker series, workshops and training collaborations aligned with the four research themes

Goal #5 – Communication about NGI research, activities, and opportunities through traditional and non-traditional channels

Strategies:

- Annual NGI conferences with all NGI principal investigators
- Quarterly NGI meetings with Research Fellows
- Informed CI Directors and Administration
- NGI website with program messages and timely dissemination of information
- Evaluation criteria for research publication and dissemination
- Media coverage of NGI activities

Objectives:

- Develop and host NGI conferences and meetings
- Attend the CI Directors & Financial Administrators Meeting
- Populate the NGI website with pertinent documents and research program information
- Initiate and support media coverage of NGI activities

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- Establish and implement evaluation criteria to encourage publication and dissemination of research results

Goal #6 – Build and maintain a NGI framework and culture that fosters collaboration and maximized human potential

Strategies:

- NGI identity and collegiality
- Mechanisms to encourage and recognize the participation of young researchers and students

Objectives:

- Host NGI meetings
- Review and update the NGI web site
- Select students to receive NGI awards/honors
- Award NGI student internships

6.0 Annual Proposal Development and Evaluation

All previously funded, multi-year projects are reviewed by the NGI Program Staff, NGI Council of Fellows, and the NOAA NGI Science Coordinator on an annual basis. The renewal and the continuing support of these projects are subject to availability of funds and dependent upon: satisfactory progress, demonstrated quality of the work performed and demonstrated NGI/NOAA interactions. All projects ending during the review cycle are required to submit a final report.

For new projects, NGI publishes a call for letters of intent (LOI) in the fall of each award year. LOIs and subsequent proposals must follow the outline defined in the Call for Letters of Intent and Proposals document which, in general, follows the guidelines established for proposals to the National Science Foundation.

The NGI Program Staff, the NGI Council of Fellows and the NOAA NGI Science Coordinator evaluate each LOI. The joint group then submits their recommendations for full proposals to the NGI Director and NOAA Program Director for Cooperative Institutes. Final decisions are made by the NGI Director who, through the NGI program Office in early winter, invites the selected proposers to submit full proposals by late winter. The NGI Fellows also have authority to invite additional proposals if they believe that critical research gaps continue to exist.

The NGI Program Staff, the NGI Council of Fellows and the NOAA NGI Science Coordinator then evaluate the full proposals. NOAA subject area experts, selected by the NOAA NGI Science Coordinator, also perform independent evaluations.

Based on these evaluations, the NGI Director, consulting with the NGI Fellows and NOAA Program Director for Cooperative Institutes, makes the final award selections by mid-spring with proposer notification soon thereafter.

The primary evaluation criteria are as follows:

- How does the proposal further NOAA goals and reflect NOAA research priorities, information needs and management support; and contribute specifically to one or more of the NGI Themes?

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- How does the proposal reflect regional interests, requirements and applications; and, what provisions are made to extend local investigations to regional applications? For example, see Gulf of Mexico Alliance Governors' Action Plan 2⁶, the Gulf Coast Services Center (NOAA) Needs Assessment⁷ and the Gulf of Mexico Research Plan⁸.
- What is the scientific and or technical merit of the project? This criterion assesses whether the proposed approaches in the work plan are technically sound and/or innovative and if the methods are appropriate.
- With whom and how will the project collaborate and in what ways (i.e., cooperative research linkages, involvement of prospective users in the project)? Specific attention should be given to collaboration among NGI institutions, with NOAA research and line organizations, other federal agencies (EPA, NASA, USGS, COE, etc.), and the Northern Gulf and user communities.
- Does the project describe the baseline conditions for the project: i.e., the "state of the science", "gaps in management systems", "lack of public understanding," etc. against which project progress can be measured and communicated? Why is this research important?
- Does the project use students or post-doctoral personnel in the project?
- What approach and steps are proposed to make the transition from research to decision-support uses of project results?
- Overall qualification of applicants and partners. This criterion ascertains whether the applicant possesses necessary education, experience, training, facilities, and administrative resources to accomplish the project.
- What are the project costs? This criterion evaluates the budget to determine if it is realistic and commensurate with the project needs and time-frame.

7.0 Reports

7.1 Annual NGI Spring Meeting. Depending on the format of the meeting, each project will be expected to produce either a poster or short presentation of their results and plans.

7.2 Annual Progress Report. On or about June 1 of each year an annual progress report will be due to the NGI Program Office for inclusion in the NGI Annual Progress Report to NOAA. The period of the report is typically from July 1 of the previous year until June 30 of the reporting year. In the final year of a project, the report will cover the total period of the project. The NGI Program Office distributes the format of the annual project progress report to the individual PIs after its approval by the Council of Fellows.

⁶ <http://gulfofmexicoalliance.org/actionplan/welcome.html>

⁷ [http://www.csc.noaa.gov/needsassessments/\(Gulf\)%20GULF_NEEDS_FINAL.pdf](http://www.csc.noaa.gov/needsassessments/(Gulf)%20GULF_NEEDS_FINAL.pdf)

⁸ <http://masgc.org/gmrp/index.htm>