Margaret A. Davidson Graduate Fellowship

This two-year fellowship is focused on field research within the nation's diverse estuaries. You will work with a mentor, fellow scientists, and local communities to help address coastal challenges. The fellowship includes networking opportunities and career-readiness training.

The **North Carolina National Estuarine Research Reserve** (NC NERR) represents the unique biogeography of coastal North Carolina at four geographically disparate sites (Currituck Banks, Rachel Carson, Masonboro Island, Zeke's Island) with diverse estuarine habitats.

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NC NERR welcomes applicants to the Davidson Fellowship interested in researching one of the Reserve's key **management needs**:

Ecosystem services. To inform future coastal management strategies, the reserve is interested in projects that quantify ecosystem services and help us better understand how these services may change in response to climate change, invasive species, and coastal development. Potential study projects include better quantification of ecosystem services provided by oyster reefs and marshes related to wave dampening, shoreline protection, and maintenance of water quality; and comparative analyses of ecosystem services provided by wetland or aquatic non-native and native species.

Vulnerability and Resilience. Habitats at the reserve are vulnerable to climate change impacts (e.g., sea-level rise, increases in storminess and temperature), and their vulnerability is influenced by human activities (e.g., sand placement, dredging). The reserve is interested in projects that provide more information about habitat vulnerability and potential actions to increase resilience. Possible projects include: evaluating the potential for habitat migration; building upon current resilience work at the Rachel Carson Reserve; and understanding the vulnerability of ocean beach and marsh habitats at the Masonboro Island Reserve, and recommending opportunities to enhance resilience.

Zeke's Island Reserve Assessments, Water Quality, Monitoring Data Synthesis. The reserve has identified sedimentation, degraded water quality, sea-level rise, and invasive species as stressors for the Zeke's Island Research Reserve in their 2020-2025 management plan. Causes and extent of changes at the site, however, are not well understood. We seek research partnerships to help us better understand water quality trends and other contributing factors that may be influencing changes in water depth and water quality, including ecosystem metabolism, episodes of hypoxia, and algal mat growth. The project will use the reserve's monitoring data and other relevant data.

Connection with Underserved Communities. The reserve has connected with nearby, historically underserved communities through our education programs (i.e., school field trips to the Rachel Carson Reserve and Masonboro Island Reserve), but we lack an understanding of how these communities use the reserve sites and how to meaningfully connect with and serve these communities. We are seeking proposals for research and partnerships that will help us better understand the underserved communities located near reserve sites and design an effective engagement strategy.

Management needs (con't):

Habitat mapping and assessment. As part of the System-Wide Monitoring Program, reserve habitats are mapped from the uplands to the intertidal marsh-water edge. We have used remote sensing, including aerial imagery and drones, to map select areas of intertidal habitats, and we continue to expand the integration of remote sensing tools. The reserve is interested in proposals to develop novel methods and workflows to remotely assess intertidalto-subtidal habitat components at user-defined spatial (e.g., patches to landscape) and temporal scales (e.g., before and after events, seasonal, and annual cycles) to better monitor wetland, oyster, and submerged aquatic vegetation habitats and integrate with broader-scale mapping efforts.

Collaborative science

Each fellowship project will employ the tenets of collaborative science. The goal of collaborative science is to ensure that information generated from research is useful for decision-making. This requires that the users of the research be integrated into the research process, which increases trust and legitimacy in the research product.

The collaborative process:

- Identify intended end users
- Engage end users throughout, from project idea to product development (e.g., stakeholder engagement, focus group, advisory committee, collaborative team)
- Disseminate research results to end users

Benefits and professional development opportunities

Applications are due December 4, 2023

Funding – Fellows receive up to $45,000 per year in direct support through the fellow's academic institution. A travel budget allocation of approximately $7,000 per year is recommended to cover travel to one fellows meeting and one professional conference each year.

Eligibility – Eligible applicants must be citizens or permanent residents of U.S. states or territories admitted to or enrolled in a full-time graduate program at a U.S. accredited college or university, working to obtain a master's or doctoral degree. Applicants must plan to be enrolled for all of the first year, and the majority of the second year, of funding.

Time at the Reserve - Fellows are expected to spend as much time as possible at the reserve during the two-year fellowship. The minimum requirement for on-site research is 6 weeks (consecutive or nonconsecutive) each year.

Mentoring – The NC NERR will determine an appropriate mentor based on expertise and availability. All parties will agree to and sign a mentoring plan to ensure that responsibilities are clear.