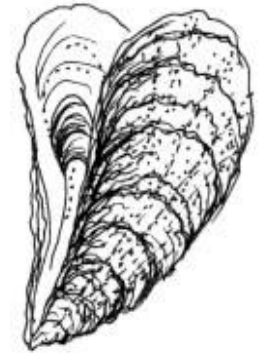


North Carolina Oysters: A Workshop to Chart Future Restoration, Learning from the Past



**Twenty years of oyster research, restoration, and management
in North Carolina**

Survey Respondents

- Survey distributed to 49 professionals, 24 individuals responded to survey (49% response rate)
- Government, academic, private, and non-profit sectors represented (Figure 1)
- Respondents represent 10 organizations active in oyster research, restoration, and management

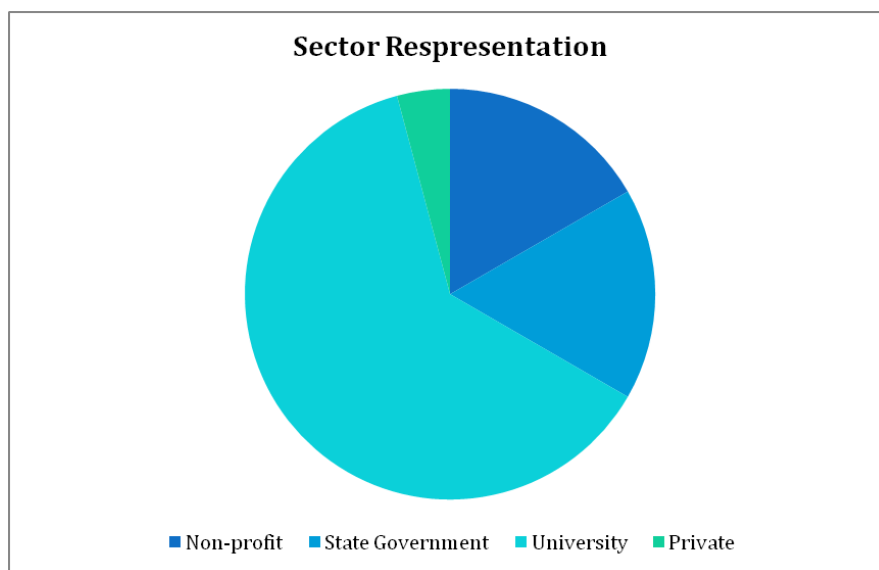


Figure 1.

Key Collaborators

Collaborative partnerships for oyster research, restoration, and management in North Carolina involve agencies and organizations at the federal, state, and local level. The organizations listed below appear in descending order of mention as key collaborators and funding sources for oyster projects.

- National Oceanic and Atmospheric Administration
- North Carolina Sea Grant
- Restore America's Estuaries
- National Science Foundation
- North Carolina Department of Environment and Natural Resources (including North Carolina Division of Marine Fisheries, the North Carolina Coastal Recreational Fishing License, and North Carolina Aquariums)
- Albemarle-Pamlico National Estuary Partnership
- Fish America Foundation
- North Carolina Coastal Federation
- University of North Carolina Charlotte
- Estuary Restoration Act

- Southeast Aquatic Resources Partnership
- TogetherGreen
- United States Fish and Wildlife Service
- North Carolina State University
- The Nature Conservancy
- University of North Carolina Institute for the Environment

Project Undertakings

- Survey respondents cited experience in oyster research, management, and restoration spanning a twenty year period (Figure 2)
- Survey respondents have played a part in over 219 oyster-related projects (Figure 3)
- 82% of oyster projects undertaken by survey respondents occurred from the White Oak River north (Figure 4)
- Survey respondents have experience working on oyster-related projects in a variety of different habitats, including subtidal and intertidal reefs (Figure 5)

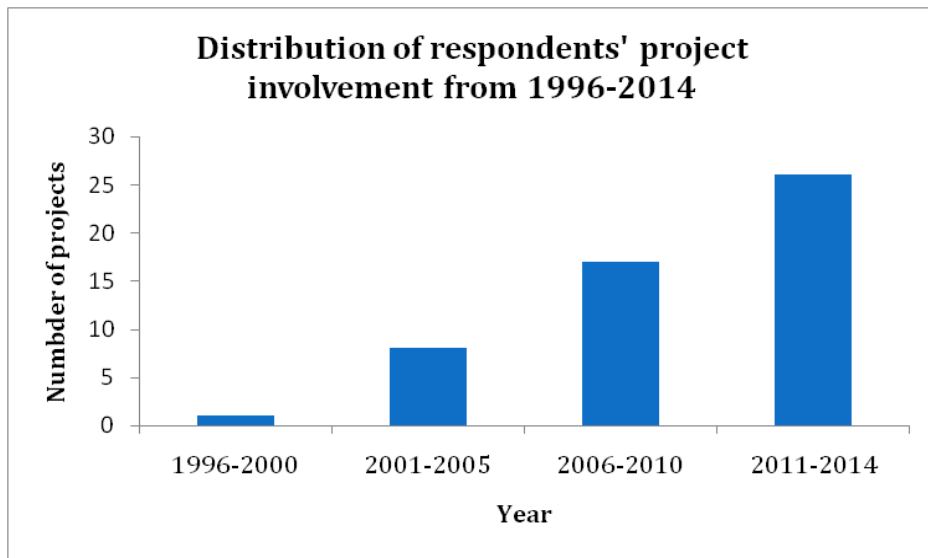


Figure 2.

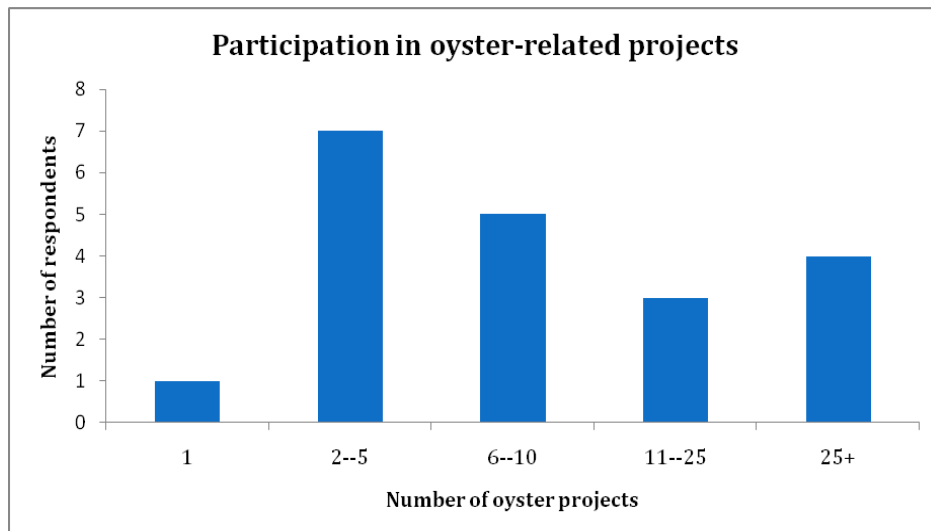


Figure 3.

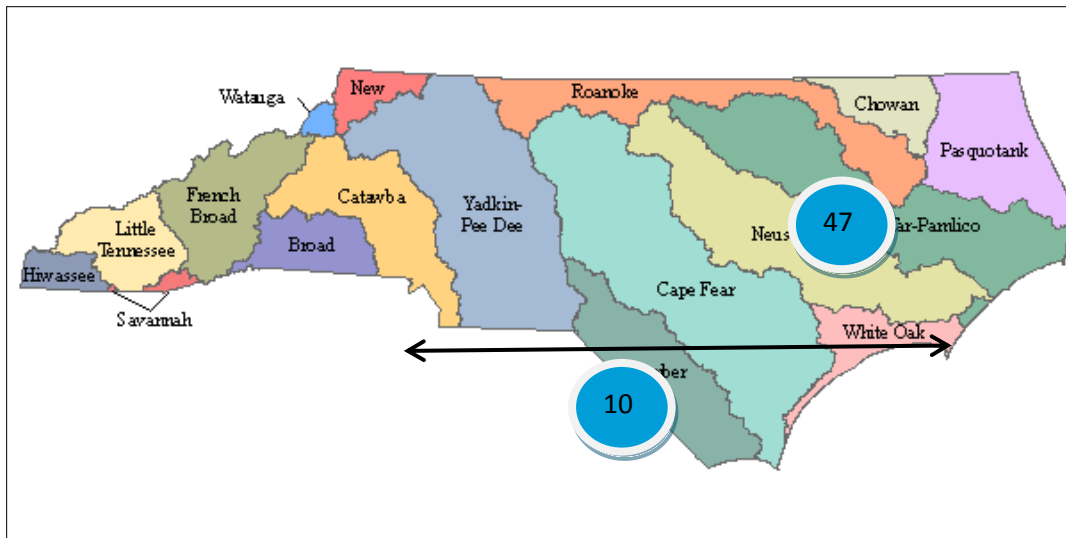


Figure 4.

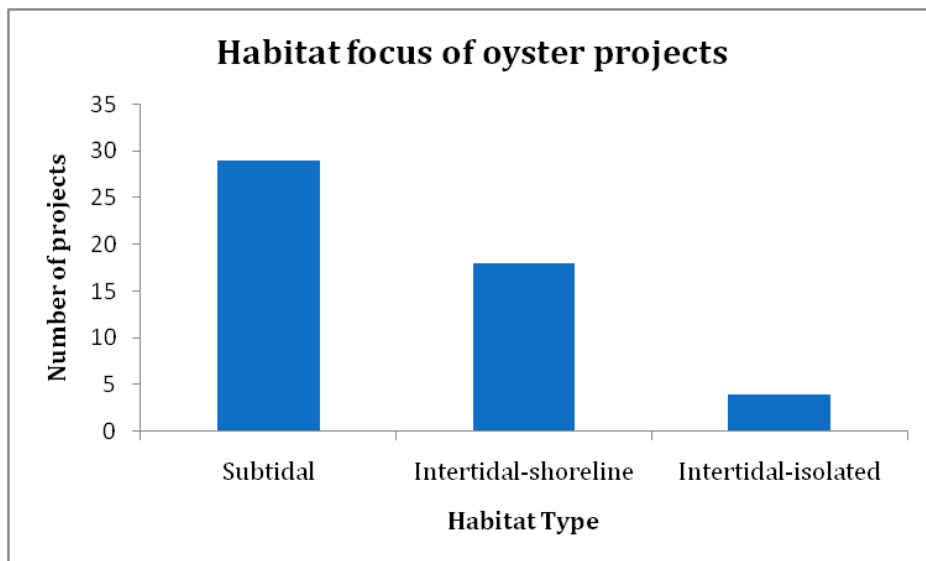


Figure 5.

Knowledge Gaps

(Numbers indicate how many respondents identified each issue)

- Quantitative valuation of oyster ecosystem services, including carbon sequestration and water filtration capacity (9)
- Detailed demographic data and an understanding of oyster population dynamics (6)
- Predator-prey dynamics in oyster reef ecosystems, including boring sponge predation on oysters (4)
- Influence of local conditions (especially wind-driven currents and tidal regimes of North Carolina sounds on oyster reef design (3)
- Larval behavior and how dispersal and recruitment mechanisms interact with local conditions (3)
- Effects of disease on oyster populations (3)
- Relationship between salinity dynamics and oyster reef development (3)

- Lack of established restoration best management practices (BMPs) or consensus on restoration objectives (3)
- Ecological differences between subtidal and intertidal reefs (2)
- Resilience of oysters and oyster reefs to ocean acidification and changing climate
- Evaluation of oyster health and population in closed shellfishing areas
- How to integrate mariculture in restoration efforts

Recommendations

(Numbers indicate how many respondents identified each issue)

- Establish research-based BMPs for restoration and management, incorporating iterative revisions and metrics for monitoring project success (5)
- Map established oyster areas in North Carolina (5)
- Enhance communication among stakeholders involved in oyster research, management, and restoration (4)
- Establish quantitative goals for oyster population size and restoration (3)
- Perform an oyster population stock assessment (3)
- Further develop oyster mariculture and North Carolina oyster marketing message, include mariculture in quantifying restoration efforts (3)
- Increase funding (2)
- Characterize oyster reef-associated species by depth, reef material type, latitude, reef age, and fishing pressure (2)
- Streamline permitting process for oyster restoration and enhancement activities (2)
- Establish/continue oyster shell recycling program (2)
- Conduct a quantitative valuation of oyster reef ecosystem services (2)
- Plant substrate, such as reef balls, to enhance habitat
- Add larger scale oyster data collection to traditional patch or quadrant-based collection methods
- Establish linkages between oyster reef characteristics and finfish/shellfish production
- Encourage private involvement in oyster restoration and enhancement
- Enhance oyster health monitoring to more accurately determine causation of reef success or failure
- Understand influence of oyster sanctuaries on recruitment in harvested areas