

Goals and Objectives

The overall goal of the Center for Applied Aquatic Ecology will be to provide information needed by policy makers as they form and revise regulations aimed at optimizing management and wise use of these resources from the perspective of protecting fish and human health. The Center's specific objectives will be (i) to conduct relevant applied environmental research on freshwater, estuarine and marine resources of the State, with emphasis on chronic and acute impacts of nutrient over-enrichment and other pollution on *Pfiesteria*, other harmful algal blooms, seagrass meadows and other critical vegetation habitats, fish populations, and mammalian health (especially *Pfiesteria*-related impacts); (ii) to provide training and support opportunities for advanced undergraduate students, graduate students, and post-doctoral fellows; and (iii) to serve as a focal point for the continuing advancement of research on the toxic *Pfiesteria* complex.

This Center will develop new analyses of aquatic environmental issues in North Carolina and the nation. In order to improve public and private access to research findings, CAAE will also coordinate two-way interactions between research faculty and state/national policy makers. The Center will also provide educational opportunities for students to become better equipped scientifically to identify and analyze significant aquatic environmental issues facing society.

Organization

The Center Director will report administratively through the NCSU Department Head of Botany, and the Dean of the College of Agriculture and Life Sciences. An advisory counsel, including faculty with appointments at other NCSU Colleges and other research institutions; relevant state officials; and stakeholders with special knowledge of resource and environmental issues will be constituted as soon as appropriate in the planning process. The proposed director, Dr. JoAnn Burkholder, a distinguished aquatic environmental scientist, will be responsible for operation of the Center and will provide leadership for:

1. Developing the Center's aquatic environmental research, academic, and aquatic environmental outreach programs.
2. Fostering collaboration and cooperation among relevant environmental scientists, natural resource economists, and environmental education outreach specialists.

3. Developing external support to complement the resources committed by the College and the Department to provide services to faculty, staff, and students associated with the Center's activities.

Three classifications of resident faculty appointments are proposed for the Center: (a) research/teaching appointments, (b) research appointments, and (c) visiting scientist appointments, to augment expertise in certain specialty areas as needed. We also would provide for appropriate affiliate environmental sciences faculty desiring such status, having appointments in other NCSU departments and colleges, other research universities within the UNC system, private area universities, and/or research institutes.

Need for the Center

North Carolina is the major epicenter for toxic *Pfiesteria* outbreaks in the nation. *Pfiesteria* is regarded as an indicator of poor water quality. Isolated from the ocean by the Outer Banks, our State's largest estuarine system, the Albemarle-Pamlico, is among the most poorly flushed in the world, and major arteries such as the Neuse and Pamlico are especially sensitive to impacts from nutrient loading and other pollution. In recent years this State has become recognized throughout the country in its struggle to confront very serious water quality issues.

Among North Carolina's critical challenges in the years ahead, perhaps the most formidable will be its environmental problems. North Carolina's citizens consistently rank the environment as among the most important policy issues facing the State. More than a decade ago (1987), the state issued its first *State of the Environment* report which noted the importance of the state's natural heritage from the mountains to the coast for its citizens' quality of life. In 1994 the North Carolina Coastal Futures Committee (on which Dr. Burkholder, the director of the proposed Center for Applied Aquatic Ecology, served) highlighted the exponential population growth (especially in coastal areas) and degradation to the coastal environment over the past two decades. North Carolina was ranked 43rd to 47th (depending on the source) in per capita funding for environmental programs.

Increasing populations of people as well as swine and poultry have compounded the water policy issues and the water quality impacts that are being confronted by state and local governments. While the primary focus of the State has been on coastal water quality issues in the past few years, freshwater resources in North Carolina's western mountainous areas are being impacted by accelerated watershed development, as well. The response of aquatic communities