

Patuxent Wildlife Research Center

Ecological Thresholds for Salt Marsh Nekton and Vegetation



The Challenge: Salt marshes are important coastal habitats that are among the most productive natural systems on earth, and that provide nursery areas for fish and other marine life. However, salt marshes on the east coast of North America have been heavily impacted by urban development, physical manipulation for road and other construction, excessive nutrient input from nearby communities, and frequent grid ditching for mosquito control.



The Science: Many salt marshes are currently protected in national parks and wildlife refuges, but these important natural areas are still threatened by the effects of nutrient input, sea level rise, various types of physical manipulations, and other stressors. The purpose of this project is to provide information for resource managers on threshold conditions of salt marsh nekton (fishes and crustaceans) and plant communities that indicate stress to the system, and that can be used to trigger management action.



The Future: Data were compiled on nekton communities at numerous sites on 81 salt marshes, and plant communities at 70 salt marshes from Maine to Virginia, and included a gradient from sites in relatively natural condition to those that were highly impacted. A general shift in the nekton community was apparent, with fish predominating at relatively natural marshes in watersheds with low human population densities, while shrimp predominated in more highly impacted marshes in watersheds with high human population densities. Similarly, vegetation shifted from predominantly halophytic species on natural marshes to more facultative and invasive plants in more highly impacted marshes. These results are used to develop thresholds of nekton and vegetation conditions for salt marsh management in the northeastern and mid-Atlantic United States.