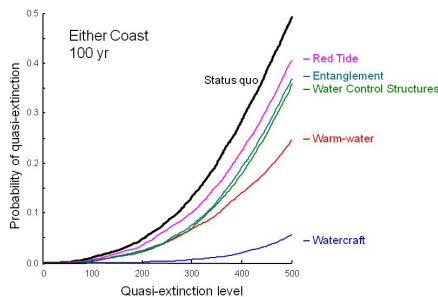


Modeling, Estimation, and Adaptive Management of Florida Manatees



- **The Challenge:** Florida manatees are threatened by watercraft-related mortality, the potential loss of warm-water habitat, red tide events, and other anthropogenic factors. The USFWS and the Florida Fish and Wildlife Conservation Commission have regulatory authorities under the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), and state statutes to recover manatees. To support management decision-making, these agencies need quantitative assessments of population status.



Probability of quasi-extinction for manatees over 100 yr, under a variety of scenarios that would address individual threats.

- **The Science:** Working with scientists at the USGS Sirenia Project and Florida's Fish and Wildlife Research Institute, Patuxent scientists have estimated life-history vital rates of manatees, incorporated those into a stochastic population model, and used that model to evaluate the threats facing manatees. Results from Patuxent's modeling work have been the foundation of several regulatory documents, including the 2005 incidental take regulations under the MMPA, and the 2007 5-year review under the ESA.
- **The Future:** USFWS is currently preparing to undertake another status review under the ESA, which could pave the way toward reclassification of manatees to threatened. In addition, USFWS is undertaking a stock assessment under the MMPA to evaluate, among other things, whether anthropogenic mortality exceeds allowable levels. The state of Florida is preparing to assess whether manatees are meeting the Measurable Biological Goals developed in their management plan. All of these assessments will be informed by updated parameter estimation and population modeling.

