

What Do FISH Tell Us?

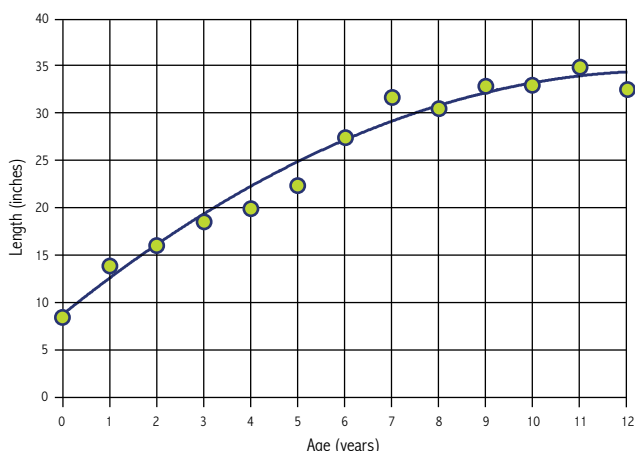
By Peter Clarke, New Jersey Coordinator, Atlantic Coastal Cooperative Statistics Program

One of the key elements to fisheries stock assessments is the comprehensive biological data collection including age, length, weight, and sex information for each species studied. As the importance of stock assessments grew and the lack of biological data loomed, New Jersey developed wide-ranging biological sampling programs through funds dedicated to help manage state fisheries and which were provided by the Atlantic Coastal Cooperative Statistics Program. The New Jersey sampling program focuses on port as well as at-sea sampling of the commercial fishing industry using age data collected for both recreational and commercial management.

Commercial port sampling encompasses age, length, and weight data for weakfish, American shad, American eel, Atlantic croaker, and Atlantic menhaden. At-sea observer coverage for American lobster and tautog includes length and sex information for both species, additional weight measurements for tautog while a sub-sample of tautog are retained for aging.

In light of current weakfish management revisions in New Jersey, a step-by-step case study of the stock assessment process is worth reviewing. The following case study for weakfish focuses on the commercial landings and biological samples collected through New Jersey's sampling program. The same type of information is also collected and analyzed from the recreational fishery. This process is commonly used for all species listed above although some technical details do vary.

Weakfish Length at Age Key



Case Study: Weakfish

Multiple steps are required between the time the fishing vessels catch and harvest the fish to the time the data is used for stock assessment models and management.

- Weakfish commercially harvested by gillnets, otter trawl, and pound nets are landed at a commercial dock for sale to the public. Landings (in pounds) are reported through an online electronic reporting system by dealers.
- When landings occur, Atlantic Coastal Cooperative Statistics Program staff in New Jersey arrive at commercial docks and collect random samples of the day's catch. Generally 100 samples per trip are collected. Measurements taken include weight and length of each fish. Fish ear bones (otoliths) are removed for aging, processed, then aged like counting the rings of a tree trunk's cross-section.
- The age and all other physical data collected are combined into the state biological characterization database.
- All age, length and weight data is provided to Fish and Wildlife's stock assessment biologists for inclusion in the coastwide stock assessment. This assessment combines biological data from all east coast states that sample for weakfish including Rhode Island, New Jersey, Delaware, Maryland, Virginia and North Carolina. The stock assessment looks at the data in a multitude of ways such as by region, state, year, gear type and season. Landings are converted from total *pounds* landed to total *number* of fish landed by age. This type of analysis is called an *age structured stock assessment* and helps biologists estimate fishing mortality, biomass, recruitment and the overall status of the stock by individual age classes of the fish.
- Once the stock assessment models are completed, the findings are sent for peer review through an independent scientific organization.
- If the peer review finds the assessment is sound in its approach, the findings are presented to the Atlantic States Marine Fisheries Commission Weakfish Management Board (the Board).
- The Board accepts the assessment and discusses the findings to determine if a management strategy change is appropriate. If necessary, the Board sends the decision back to the Weakfish Technical Committee, which must create management options such as trip limits, bag limits, seasons and/or size limits.
- Once the management options are approved by the Board, the options are presented for public comment. The Board considers all public comment when making final management decisions. The new management strategy is then communicated to all east coast states for agency implementation.
- States are required to implement the new management strategy and the associated actions. If failure to implement occurs on the state level, that state is found to be out of compliance and the state's fishery is closed. See page 6 for more on the 2010 New Jersey weakfish management plan.

State-specific samples are important given the large data variation occurring across regions and between states. For example, during the last weakfish stock assessment, weakfish harvested in the north were significantly larger and older than weakfish found in the south. Consequently, if the total landed pounds were converted using southern stock characteristics, the outcome would have shown New Jersey harvested much smaller and younger fish than had actually occurred. In the end, since *fish tell us* a great deal about the health and structure of their population, it is particularly important to conduct studies such as these to help fisheries managers make sound and accurate decisions.



Otolith from a 30-inch weakfish.



Cross-section of otolith prepared for aging.

Peter Clarke, NJACCSP

Chris Chambers, NMFS