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Monitoring and Observing Living Marine Resources in the Gulf of Maine

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Abstract

The Northeast Fisheries Science Center monitors the abundance, distribution, and status of living marine resources off the northeast coast of the United States from Maine to North Carolina by collecting fishery dependent and fishery independent data. Fishery dependent data include information from fish dealers as well as from individual commercial and recreational fishers. Information is provided on the amount of each species caught, the areas fished, and the amount of time spent fishing. Biological samples are also obtained from a small percentage of trips. Time series of landings by stock area, landing per unit effort (LPUE), and effort are used in assessing the status of a stock.

Fishery independent data are obtained primarily through research surveys and from cooperative research and industry surveys. The NEFSC conducts stratified random bottom trawl research vessel surveys to monitor the abundance of groundfish, and dedicated surveys to monitor Northern shrimp, clams, and scallops. Surveys are also conducted to observe marine mammal populations. The bottom trawl research vessel surveys are conducted in the winter, spring, and autumn each year to observe and monitor fluctuations in marine resources. These surveys collect information on weight and species composition of the catch and record all length frequencies. Age structures are obtained, primarily from the commercially and recreationally important species, as well as food habit samples, and observations on sex and maturity of the fish. Special sampling is also done as requested by NEFSC scientists or academic institutions. Other survey work is conducted on board including sampling for phytoplankton and zooplankton and collecting salinity and temperature measurements. Data are captured electronically at sea. Time series of abundance and biomass indices, spatial and temporal distribution patterns, and basic biological information all provide information for determining the status of the stock.

Different types of assessments are used in evaluating stock status depending on the amount and character of data available. An age or size structured model is used for

stocks that have both commercial and survey age disaggregated data. A production model is used for stocks that have both commercial and survey age aggregated data. An index-based assessment is employed for stocks that only have one source of data, either from the survey or from the harvesting sector. Information obtained from assessments, i.e. time series of fishing mortality, biomass, and recruitment all provide indicators of the status of the stock.

Some stocks are transboundary and data are exchanged and cooperative assessments conducted with the Department of Fisheries and Oceans (DFO) in Canada. All assessments are peer reviewed, either by the Northeast Regional Stock Assessment Review Committee (SARC) or the US/Canada Transboundary Resources Assessment Committee (TRAC).