

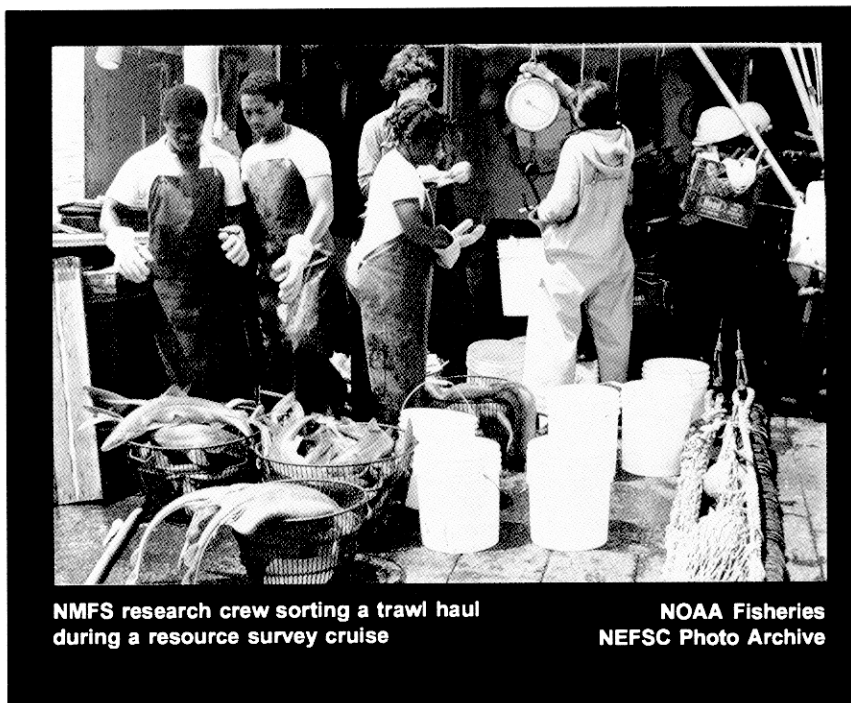
# Species Synopses

The synopses of information on the status of the stocks of the 39 species or groups of species presented in this section are based on commercial and recreational fishery data and on research survey data, as described in the Introduction to this report. Each synopsis briefly reviews the biology of the animals and the general nature of the fishery, summarizes recent catch statistics and stock assessment results, indicates the general status of the stock, and where possible, predicts future stock status.

For each stock or species a summary table<sup>1</sup> of catch statistics is presented, along with graphs depicting trends in landings and stock abundance. The measures of stock abundance used include research vessel survey catch per tow, estimated stock biomass from virtual population analyses, and catch per unit of fishing effort.

Indices of abundance from the NEFSC research vessel bottom trawl surveys were smoothed using an autoregressive integrated moving average (ARIMA) time series model. The approach is based on the concept that biomass of multi-age class stocks should not be expected to change radically from year to year without the identification of a reasonable causative agent. The ARIMA model filters the effects of measurement error (random within survey variation) in the survey abundance indices from true variation in population levels and therefore provides better estimates of population trends. Abundance indices from special surveys such as the NEFSC scallop and clam surveys, and the Massachusetts Division of Marine Fisheries bottom trawl survey were

<sup>1</sup> The tables in this section are labeled using decimal notation by species and table within that species. For example, Table 7.2 indicates the second table for the seventh species synopsis, yellowtail flounder.



NMFS research crew sorting a trawl haul during a resource survey cruise

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not modeled using ARIMA due primarily to the shorter durations of these time series.

References in the text to catches or indices of abundance usually refer to values given in the tables and figures. In some cases, however, summary statistics provided in the text for different areas, fishing gears, or data sources are not presented in the tables and figures. Catch statistics in the tables are given in thousands of metric tons (mt), rounded to the nearest 100 metric tons; values less than 100 mt are indicated as <0.1.

Many of the assessments summarized in this section have been prepared and/or reviewed through the Northeast Regional Stock Assessment Workshop (SAW) process described in the Introduction. The reports of these workshops, and reports in which the assessments are described in greater detail, appear in the NEFSC Reference Document series and are cited where applicable. These documents are available on request from the NEFSC.

## For further information

- Box, G.E.P., G. Jenkins. 1976. Time series analysis: forecasting and control. Revised edition. San Francisco: Holden-Day.
- Fogarty, M.J., J.S. Idoine, F.P. Almeida and M. Pennington. 1986. Modeling trends in abundance based on research vessel surveys. ICES [International Council for Exploration of the Sea] C.M. 1986/G:92.
- Northeast Fisheries Center. 1988. An evaluation of the bottom trawl survey program of the Northeast Fisheries Center. NOAA Tech. Memo. NMFS-F/NEC-52.
- Pennington, M. 1985. Estimating the relative abundance of fish from a series of trawl surveys. *Biometrics* 41:197-202.
- Pennington, M. 1986. Some statistical techniques for estimating abundance indices from trawl surveys. *Fish Bull. (U.S.)* 84:519-526.