

RESEARCH HIGHLIGHTS



March - April
1992

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The Northeast Fisheries Science Center's *Research Highlights* is a news bulletin on selected Center research findings. News write-ups focus on practical applications and implications of those findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each write-up to contact for detailed information. Names of organisms follow--to the extent possible--the lists of scientific and common names of fishes, mollusks, and decapod crustaceans published by the American Fisheries Society. Any mention of trade names does not imply endorsement. *Research Highlights* is produced by the NEFSC Information Services Unit with the assistance of the Center's scientific staff.

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National Marine Fisheries Service
Northeast Region
Northeast Fisheries Science Center**

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Cartilaginous Fish Still Dominate Demersal Finfish Biomass

The Northeast Fisheries Science Center's spring 1992 bottom trawl survey of the Northeast's continental shelf showed continued domination of the demersal finfish biomass by cartilaginous fish. The survey, which used the NOAA fisheries research vessel *Albatross IV* to sample 326 sites between the western Scotian Shelf and Cape Hatteras, occurred during March 2 - April 16. Over 74 percent of the survey catch (by weight) was composed of just three species: spiny dogfish, winterskate, and little skate. The three "traditional" demersal finfishes -- Atlantic cod, yellowtail flounder, and haddock -- comprised less than four percent of the catch.

A *Fishermen's Report* on this survey is available upon request. The report lists the location (latitude & longitude and loran bearings), towing direction, bottom depth & temperature, and date & time for each sampling site.

Contact Linda I. Despres-Patanjo, (508) 548-5123

Northwest Atlantic Herring Continue Long-term Recovery

While many demersal finfish populations (haddock, yellowtail flounder, etc.) are at low levels, some pelagic finfish populations (Atlantic herring, Atlantic mackerel, etc.) are at high levels. The recovery of Atlantic herring populations from foreign overfishing in the 1970s is particularly dramatic as the following table shows:

Number (in billions) of age 2+ Atlantic herring
in the Northeast Shelf Ecosystem
during the past quarter century

Year	Number	Year	Number	Year	Number
1967	10.8	1976	1.9	1985	0.3
1968	11.5	1977	1.6	1986	5.7
1969	8.5	1978	3.0	1987	6.8
1970	6.4	1979	0.1	1988	7.3
1971	4.6	1980	0.1	1989	7.0
1972	8.3	1981	0.1	1990	10.1
1973	6.0	1982	0.1	1991	8.5
1974	3.8	1983	0.1		
1975	3.1	1984	0.1		

Those who follow the Northeast Fisheries Science Center's publicizing of scientific estimates of fish population sizes will notice that for this species there is an apparent large difference between the (higher) values in the table shown above and the (lower) values in tables publicized in previous years. That apparent difference is due to the fact that the previously publicized estimates of

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Atlantic herring population size referred only to the Gulf of Maine population, while the above estimates refer to the Gulf of Maine, Bay of Fundy, and Georges Bank populations collectively.

Contact Dr. Kevin D. Friedland, (508) 548-5123

No Evidence Yet of Shellfish Contamination by Arsenic Spill

The Northeast Fisheries Science Center has not yet detected any contamination of water, sediment, or shellfish resources in an area off Delaware Bay where arsenic-laden drums were spilled on January 3-4. Concern for such contamination began immediately after the container ship *Santa Clara I* lost more than 400 drums of arsenic trioxide about 35 miles east of Delaware Bay. By early February, the Center had sampled and tested the water and sediment in and around the spill site. No trace of the spilled arsenic was found in any of the samples.

As a followup, the Center sampled ocean quahogs, Atlantic surfclams, and sea scallops in and around the spill site during March, and provided the samples to the Food and Drug Administration for testing. Those test results have been released. Again, no trace of the spilled arsenic was found in any of the samples.

However, because some of the drums ruptured during the spill and are still on the bottom, the National Marine Fisheries Service has extended its moratorium on surfclamming in the area to August 10.

Contact Anthony Pacheco, (908) 872-3090

Lobster (in value) and Herring (in weight) Lead 1991 New England Landings

Commercial landings of seafood species in New England during 1991 totaled 646.6 million pounds worth \$592.6 million in dockside or "ex-vessel" prices. The most landed species was Atlantic herring at 106.0 million pounds. The most valuable species was American lobster at \$149.9 million.

The change in landings between 1990 and 1991 was noticeably different for the demersal and pelagic components of the region's fisheries. The three "traditional" demersal species -- Atlantic cod, haddock, and yellowtail flounder -- collectively showed a 14-percent decrease in pounds landed. The four dominant pelagic species -- Atlantic herring, Atlantic mackerel, butterfish, and longfin squid -- collectively showed a little more than a one-percent increase in pounds landed.

Detailed tables listing the landings by pounds and dollars for 1990 and 1991 on a species, state, and port basis are available upon request.

Contact Ronnee L. Schultz, (508) 548-5123

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Heavily Fished Stocks Showing Quicker Sexual Maturation

The Northeast Fisheries Science Center has documented the maturation rates of 29 stocks of 19 species of Northeast finfish collected during 1985-90. Many of the stocks showed significantly quicker maturation during 1985-90 than they did during earlier time periods. This quicker maturation during a period of heavy fishing pressure may be an illustration of a phenomenon which has been observed in other fisheries ecosystems: (1) heavy fishing removes a large portion of a fish population; (2) remaining fish have proportionately more prey to eat; (3) increased feeding increases individual growth rate; and (4) faster growth rate triggers sexual maturation at a younger age or smaller size.

This phenomenon has been virtually unnoticed by commercial fishermen because the quicker maturation largely began after the regional fishery management councils adopted conservation measures in the mid-1980s which, among other things, prevented fishermen from keeping (and thus cutting open and observing) smaller/younger fish.

Contact Loretta O'Brien, (508) 548-5123

National Systematics Laboratory Annual Report Available

The 1991 annual report of the National Systematics Laboratory is available. The report includes summaries of research and service activities, as well as lists of publications, accepted papers, and completed manuscripts, associated with the laboratory's studies of fishes, crustaceans, and squids.

Contact Dr. Bruce B. Collette, (202) 357-2524

Biological Briefs

Unusual or rarely encountered fish recently captured include: (1) a pregnant shortfin mako (John G. Casey, 401-782-3320); (2) a big roughy (Donald D. Flesher, 508-548-5123); (3) an opah (Eric Braun, 516-727-0707); and (4) the epipelagic/mesopelagic cigarfish *Cubiceps caeruleus* (Eric Braun, 516-727-0707).

Two new crab species, the geryonid crab *Chaceon collettei* and the fossil homolid crab *Homolopsis williamsi*, have been named after National Systematics Laboratory scientists Dr. Bruce B. Collette (202-357-2524) and Dr. Austin B. Williams (202-357-2639).

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Recent Publications and Reports

Northeast Fisheries Science Center authors are indicated in all capital letters in the list below. Unless otherwise indicated, single reprints or photocopies of the publications and reports are available -- subject to supply -- by writing to the senior Center author, c/o Information Services Unit, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543-1097 USA.

- COLLETTE, B.B. 1992. Book review: Fishes of the Southern Ocean by O. Gon and P.C. Heemstra, eds. *BIOMASS Newsl.* 13(2): 17.
- COLLETTE, B.B.; Gillis, G.B. 1992. Morphology, systematics, and biology of the double-lined mackerels (*Grammatorcynus*, Scombridae). *Fish. Bull. (U.S.)* 90(1): 13-53.
- COLLETTE, B.B.; Parin, N.V.; NIZINSKI, M. 1992. Catalog of type specimens of recent fishes in the National Museum of Natural History, Smithsonian Institution, 3: Beloniformes (Teleostei). *Smithson. Contrib. Zool.* 525; 16 p.
- Gall, G.A.E.; Bartley, D.; Bentley, B.; BRODZIAK, J.; Gomulkiewicz, R.; Mangel, M. 1992. Geographic variation in population genetic structure of chinook salmon from California and Oregon. *Fish. Bull. (U.S.)* 90(1): 77-100.
- Hanlon, R.T.; Boletzky, S.V.; Okutani, T.; Perez-Gandaras, G.; Sanchez, P.; Sousa-Reis, C.; VECCHIONE, M. 1992. Myopsida. In Sweeney, M.J., Roper, C.F.E.; Mangold, K.M.; Clarke, M.R.; Boletzky, S.V., eds. "Larval and juvenile cephalopods. A manual for their identification. *Smithson. Contrib. Zool.* 513: 37-54.
- OVERHOLTZ, W.J.; ARMSTRONG, R.S.; MOUNTAIN, D.G.; TERCEIRO, M. 1991. Factors influencing spring distribution, availability, and recreational catch of Atlantic mackerel (*Scomber scombrus*) in the Middle Atlantic and Southern New England regions. *NOAA Technical Memorandum NMFS-F/NEC-85*; 13 p. Available from: National Marine Fisheries Service, Woods Hole, MA.
- Roper, C.F.E.; VECCHIONE, M.; Sweeney, M.J. 1992. The Gilbert M. Voss memorial issue: forward. *Bull. Mar. Sci.* 49(1-2): 3-4.
- ROSENBERG, A.; Basson, M.; Beddington, J.R. 1991. Predictive yield models and food chain theory. In Sherman, K.; Alexander, L.M.; Gold, B.D., eds. Food chains, yields, models, and management of large marine ecosystems. Boulder, CO: Westview Press, Inc.; p. 205-224.
- SHERMAN, K. 1991. Sustainability of resources in large marine ecosystems. In Sherman, K.; Alexander, L.M.; Gold, B.D., eds. Food chains, yields, models, and management of large marine ecosystems. Boulder, CO: Westview Press, Inc.; p. 1-34.
- SHERMAN, K. 1992. Large marine ecosystems. In Nierenberg, W.A., ed. Encyclopedia of earth system science. San Diego, CA: Academic Press, Inc.; p. 653-673.
- SHERMAN, K.; Alexander, L.M.; Gold, B.D., eds. 1991. Food chains, yields, models, and management of large marine ecosystems. Boulder, CO: Westview Press, Inc.; 320 p.

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- SISSEWINE, M.P.; COHEN, E.B. (deceased). 1991. Resource productivity and fisheries management of the Northeast Shelf Ecosystem. In Sherman, K.; Alexander, L.M.; Gold, B.D., eds. Food chains, yields, models, and management of large marine ecosystems. Boulder, CO: Westview Press, Inc.; p. 107-123.
- STEIMLE, F.; TERRANOVA, R. 1991. Trophodynamics of select demersal fishes in the New York Bight. *NOAA Technical Memorandum NMFS-F/NEC-84*; 11 p. Available from: National Marine Fisheries Service, Highlands, NJ.
- VECCHIONE, M. 1992. A method for examining the structure and contents of the digestive tract in paralarval squids. *Bull. Mar. Sci.* 49(1-2): 300-308.
- VECCHIONE, M. 1992. Dissolved oxygen and the distribution of the euryhaline squid *Lolliguncula brevis*. *Bull. Mar. Sci.* 49(1-2): 668-669.
- VECCHIONE, M. 1992. Long-term trends in the abundance of the copepod *Arcatia tonsa* in the Calcasieu Estuary. *Contrib. Mar. Sci.* 32: 89-101.
- VECCHIONE, M.; ROPER, C.F.E. 1992. Cephalopods observed from submersibles in the western North Atlantic. *Bull. Mar. Sci.* 49(1-2): 433-445.
- Young, R.E.; Mangold, K.; VECCHIONE, M. 1992. The enoploteuthid group of families. In Sweeney, M.J.; Roper, C.F.E.; Mangold, K.M.; Clarke, M.R.; Boletzky, S.V., eds. "Larval" and juvenile cephalopods: a manual for their identification. *Smithson. Contrib. Zool.* 513: 55-66.
- ZDANOWICZ, V.S.; GADBOIS, D. 1990. Contaminants in sediment and fish tissue from estuarine and coastal sites of the northeastern United States: data summary for the baseline phase of the National Status and Trends Program Benthic Surveillance Project, 1984-1986. *NOAA Technical Memorandum NMFS-F/NEC-79*; 138 p. Available from: National Marine Fisheries Service, Highlands, NJ.

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