

# RESEARCH HIGHLIGHTS



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1993

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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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### Selected Northeast Stocks Assessed; Herring Doing Well

The plenary panel of the 16th Northeast Regional Stock Assessment Workshop met on July 29 in Boston to evaluate recent stock assessments and develop fishery management advice on five species: pollock, summer flounder, tilefish, Atlantic herring, and American lobster. The table below lists the findings on stock levels and exploitation rates, and includes selected comments by the panel. These findings and comments are conditional; the reader should refer to the panel's full report (*Northeast Fisheries Science Center Reference Document 93-19*) for these conditions before drawing any conclusions.

Species (Stock/s)	Stock Level	Exploitation Rate	Selected Comments
Pollock (Scotian Shelf, Gulf of Maine, & Georges Bank combined)	medium	fully exploited	coordinated management with Canada needed; until then, landings should be maintained at or below current levels
Summer flounder	low	over- exploited	recruitment of 1991 year class slightly above 10-year average --provides opportunity for short- term rebuilding of spawning stock; this and subsequent year classes should continue to be protected
Tilefish	low	over- exploited	stock biomass at only 20 percent of level needed to attain maximum sustainable yield
Atlantic herring	high	under- exploited	spawning stock biomass at record- high level; recruitment of 1989 and 1990 year classes appears, initially, to be very strong
American lobster (Gulf of Maine)	high	likely over- exploited	stock accounts for 70 percent of region's landings; can improve exploitation status from over exploited to fully exploited by decreasing fishing mortality by 20 percent, or increasing mini- mum legal carapace length to 3.5 inches
(Georges Bank & south offshore)	high	fully to overexploited	
(Southern Cape Cod/ Long Island Sound inshore)	high	over exploited	

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Contact Helen Mustafa, (508) 548-5123x244, for a copy of the panel's report; contact Dr. Vaughn C. Anthony, (508) 548-5123x304, for further information on the panel's findings.

### Sea Scallop Resources Surveyed; Harvestable Biomass Near All-time Low

The Northeast Fisheries Science Center's 1993 sea scallop resource survey shows the abundance and biomass of recruited scallops (*i.e.*, greater than or equal to a 70-mm shell height) in U.S. waters to be at or near all-time lows. This decline in harvestable-sized scallops has also been reflected in the year-to-date commercial landings which are about 50-percent lower than in 1992. Consequently, next year's fishery will depend greatly on the abundance and availability of newly recruiting scallops.

In the Mid-Atlantic area, abundance of prerecruit scallops (*i.e.*, less than a 70-mm shell height) was much higher than during the past two years, and was the second highest in the 1975-93 survey time series. Abundance was particularly high in the Delmarva and Virginia - North Carolina subareas. In the Georges Bank area, abundance of prerecruit scallops was very low. In the U.S. portion of Georges Bank, abundance was the lowest in the 1985-93 survey time series, indicating that incoming year classes will be much weaker than those of the past several years.

The 1993 survey sampled 437 sites from the Canadian portion of Georges Bank to the waters off North Carolina during July 31 - August 25. A *Fishermen's Report*, showing the location of and catch at each site, is available.

For a copy of the report, contact Barbara Lewis, (508) 548-5123x281; for further information on the survey's findings, contact Dr. Daniel Hayes, (508) 548-5123x317.

### Traditional Groundfish Landings Continue Slide

Preliminary data by the Northeast Fisheries Science Center on the region's commercial landings of Atlantic cod, haddock, and yellowtail flounder during the first seven months of 1993 show a collective 29-percent decline from the same period last year. (In the last issue of *Research Highlights*, we noted that the collective decline through the first three months of the year had been 28 percent.) Through July, cod are down from 41.1 to 31.0 million pounds; haddock are down from 4.4 to 1.5 million pounds; yellowtail are down from 7.7 to 5.1 million pounds.

For additional and/or updated information on landings, contact John B. Mahoney, (508) 548-5123x309.

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### Harbor Porpoise Bycatch Declines

Bycatch (*i.e.*, accidental capture and killing) of harbor porpoise in the Gulf of Maine sink gill net fishery has dropped for the third straight year. Estimated bycatch was 5.1 percent of the estimated population in 1990, 3.6 percent in 1991, and 1.9 percent in 1992. Annual bycatch is measured as the ratio of the number of harbor porpoises killed by sink gill nets, to the number of porpoises occurring in the Gulf of Maine during summer.

It is unclear, yet, whether this trend of declining bycatch is due more to the efforts of fishermen to reduce accidental harvest of porpoises, to a decreased availability (to sink gill nets) of porpoises in the Gulf of Maine during summer, or to other factors. A copy of the report (*Northeast Fisheries Science Center Reference Document 93-23*) is available.

Contact Dr. Tim D. Smith, (508) 548-5123x251.

### Large-Marine-Ecosystem Concept Applied to Resource Management

Just as we have in recent times begun to manage living marine resources at the community level as well as at the population level, we are also now on the frontiers of managing those resources at the ecosystem level as well. Much of the theoretical foundation for such management has been laid -- a considerable amount coming from the Northeast Fisheries Science Center. The Center has recently been involved in planning, carrying out, and reporting on five international conferences aimed at bridging the gap between theory and practice. The reports are:

1. "The Large Marine Ecosystem (LME) Concept and Its Application to Regional Marine Resource Management, 1-6 October 1990, Monaco: Conference Summary and Recommendations"
2. "Report of the Meeting of the *ad hoc* Committee on Large Marine Ecosystems, 22-23 March 1991, UNESCO Headquarters, Paris, France"
3. "Large Marine Ecosystems Monitoring Workshop Report, 13-14 July 1991, Cornell University, Ithaca, New York"
4. "Summary of the Symposium on the Northeast U.S. Shelf Ecosystem: Stress, Mitigation, and Sustainability, 12-15 August 1991, University of Rhode Island, Narragansett, Rhode Island"
5. "Emerging Theoretical Basis for Monitoring the Changing States (Health) of Large Marine Ecosystems: Summary Report of Two Workshops: 23 April 1992, National Marine Fisheries Service, Narragansett, Rhode Island, and 11-12 July 1992, Cornell University, Ithaca, New York"

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Copies of the first four reports (*NOAA Technical Memorandum NMFS-F/NEC 91, 92, 93, and 94, respectively*) are available; the fifth report (*NOAA Technical Memorandum NMFS-F/NEC 100*) is in press and will be available in early January.

**For copies, contact Jennie Dunnington, (401) 782-3213; for further information on the LME concept and its applications to research and management, contact Dr. Kenneth Sherman, (401) 782-3210.**

### Tautog off Virginia Are Slow Growers

Results have been published of the first study of the age and growth of tautog in the southern portion of the species' range. Off Virginia, tautog live long (*i.e.*, 25 or more years), grow slowly (*i.e.*, the von Bertalanffy growth coefficient is only 0.085 for both sexes combined), and reach a large size (*i.e.*, more than 26 inches). Both sexes mature at three years of age. Growth rates for the species determined from this study of Virginia waters are similar to the rates determined from a 25-year-old study of Rhode Island waters.

The tautog's slow growth, the increasing fishing mortality on the species, and the limited amount of available hard-bottom habitat in the southern portion of its range could make the species very vulnerable to overfishing. A reprint of the published article on this research is available.

**Contact Dr. Thomas A. Munroe, (202) 357-4255.**

### Flounder Kidneys Limit Some Herbicide and Insecticide Damage

A joint study by the University of Connecticut and the Northeast Fisheries Science Center--using a tissue culture of winter flounder kidney--appears to show that the flounder kidney actively transports certain herbicides and insecticides from the blood into the urine. Such transport would limit the retention time, and thus the toxicity, of these chemical compounds.

Herbicides tested were the ubiquitous 2,4-D (whose transportability has been shown by other investigators using different methods) and the related compounds MCPA, dichlorprop, and mecoprop. Insecticides were chlorpyrifos, the metabolite chlorpyrifos-oxon, and the related chlorpyrifos-methyl. Of these compounds, 2,4-D, mecoprop, dichlorprop, and chlorpyrifos-oxon appear to be transported.

The potential for a toxic compound to be transported from blood to urine cannot, by itself, predict the compound's full effect on a fish's health. Metabolism of the compound in the fish's liver may affect either the compound's toxicity or its potential for being transported. Also, a compound may be toxic to the kidney itself, in which case transport may increase the compound's overall toxicity. Nonetheless, knowledge of the kidney's capacity to move toxic compounds out of blood and into urine is a useful tool in determining the effect of that compound on a fish's health.

**Contact Dr. Margaret Dawson, (203) 783-4242.**

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### Research Briefs

- A bibliography -- indexed by species, geographic area, research discipline, and author -- is now available for the Northeast Fisheries Science Center's 1989 publications, reports, and abstracts.  
Contact Jon A. Gibson, (508) 548-5123x228.
- A bibliography is available for all publications emanating from the National Systematics Laboratory during its 50-year history.  
Contact Dr. Bruce B. Collette, (202) 357-2524.
- With funding from the Coastal Ocean Program's Estuarine Habitat Program, the Northeast Fisheries Science Center and Rutgers University have begun a three-year study of the role of estuarine habitat (e.g., eel grass beds, marsh creeks, sand flats) in the recruitment of Northeast fishes (e.g., winter flounder, tautog).  
Contact Anne L. Studholme, (908) 872-3001.
- A new species of halfbeak, *Hyporhamphus meeki*, which was previously confused with the silverstripe halfbeak, *H. unifasciatus*, has been described. The former occurs along the U.S. Atlantic and Gulf coasts; the latter in Bermuda, southern Florida, and the West Indies to southern Brazil.  
Contact Dr. Bruce B. Collette, (202) 357-2524.

### Recent Publications and Reports

Northeast Fisheries Science Center authors are indicated in all capital letters in the list below. Unless otherwise indicated, single copies of the listed reports are available by writing to: Information Services Unit, Northeast Fisheries Science Center, National Marine Fisheries Service, 166 Water St., Woods Hole, MA 02543-1097 USA.

- Banford, H.M.; COLLETTE, B.B. 1993. *Hyporhamphus meeki*, a new species of halfbeak (Teleostei: Hemiramphidae) from the Atlantic and Gulf coasts of the United States. *Proc. Biol. Soc. Wash.* 106(2): 369-384.
- BENWAY, R.L.; THOMAS, K.P.; JOSSI, J.W. 1993. Water-column thermal structure in the Middle Atlantic Bight and Gulf of Maine during 1978-92. *NOAA Tech. Memo. NMFS-F/NEC-97*; 154 p.
- BISACK, K. 1993. Estimates of total by-catch in the Gulf of Maine sink gillnet fishery. *Northeast Fish. Sci. Cent. Ref. Doc.* 93-11; 23 p.
- COLLETTE, B.B. 1993. Natural reserves, inventories, and biodiversity. *Assoc. Syst. Collect. Newsl.* 21(1): 6-7.
- ESTEVEES, C.; BURNETT, J. 1993. A comparison of growth rates for American plaice, *Hippoglossoides platessoides*, in the Gulf of Maine - Georges Bank region derived from two different data sources. *Northeast Fish. Sci. Cent. Ref. Doc.* 93-09; 8 p.
- FRADY, T.L.; GIBSON, J.A. 1993. NEFSC manuscript review and scientific publishing: author's guide to policy, process, procedure. *Northeast Fish. Sci. Cent. Ref. Doc.* 93-12; 21 p.

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- GIBSON, J.A. 1993. An indexed bibliography of Northeast Fisheries Science Center publications and reports for 1989. *NOAA Tech. Memo. NMFS-F/NEC-96*; 20 p.
- HOLZWARTH-DAVIS, T. 1993. Test and evaluation of the SBE 19 Seacat Profiler. *Northeast Fish. Sci. Cent. Ref. Doc. 93-10*; 16 p.
- Hostetter, E.B.; MUNROE, T.A. 1993. Age, growth, and reproduction of tautog *Tautoga onitis* (Labridae: Perciformes) from coastal waters of Virginia. *Fish. Bull. (U.S.)* 91(1): 45-64.
- LOUGH, R.G.; POTTER, D.C. 1993. Vertical distribution patterns and diel migrations of larval and juvenile haddock *Melanogrammus aeglefinus* and Atlantic cod *Gadus morhua* on Georges Bank. *Fish. Bull. (U.S.)* 91(2): 281-303.
- MAYO, R.K.; FIGUERIDO, B.F. 1993. Assessment of pollock, *Pollachius virens* (L.), in Divisions 4VWX and Subareas 5 and 6, 1993. *Northeast Fish. Sci. Cent. Ref. Doc. 93-13*; 108 p.
- National Systematics Laboratory, Northeast Fisheries Science Center. 1993. 50 year bibliography (1942-1992) of the National Systematics Laboratory. Washington, DC: National Marine Fisheries Service; 26 p. Available from: National Marine Fisheries Service, National Museum of Natural History, 10th & Constitution Ave., N.W., Washington, DC 20560.
- [National Systematics Laboratory, Northeast Fisheries Science Center.] 1993. National Systematics Laboratory report for calendar year 1992. Washington, DC: National Marine Fisheries Service; 19 p. Available from: National Marine Fisheries Service, National Museum of Natural History, 10th & Constitution Ave., N.W., Washington, DC 20560.
- [Northeast Fisheries Science Center.] 1993. Report of the 16th Northeast Regional Stock Assessment Workshop (16th SAW): Stock Assessment Review Committee (SARC) consensus summary of assessments. *Northeast Fish. Sci. Cent. Ref. Doc. 93-18*; 116 p.
- [Northeast Fisheries Science Center.] 1993. Report of the 16th Northeast Regional Stock Assessment Workshop (16th SAW): the plenary. *Northeast Fish. Sci. Cent. Ref. Doc. 93-19*; 57 p.
- O'BRIEN, L.; BURNETT, J.; MAYO, R.K. 1993. Maturation of nineteen species of finfish off the northeast coast of the United States, 1985-1990. *NOAA Tech. Rep. NMFS* 113; 66 p.
- Parin, N.V.; COLLETTE, B.B. 1993. Results of the research cruises of the FRV 'Walther Herwig' to South America. LXIX. *Lepidopus altifrons*, a new species of cutlassfish (Pisces, Scombroidei, Trichiuridae) from the western Atlantic Ocean. *Arch. Fischereiwiss.* 41(3): 187-195.
- Roper, C.F.E.; VECCHIONE, M. 1993. A geographic and taxonomic review of *Taningia danae* Joubin, 1931 (Cephalopoda: Octopoteuthidae), with new records and observations on bioluminescence. Okutani, T., and others, eds. Recent advances in cephalopod fishery biology. Tokyo, Japan: Tokai University Press; p. 441-456.
- ROSENFELD, A., editor. 1993. Marine invertebrate cell culture: breaking the barriers--proceedings of an international workshop, 16 June 1991, Anaheim, California. *NOAA Tech. Memo. NMFS-F/NEC-98*; 25 p.
- SHEPHERD, G.R.; IDC, J.S. 1993. Length-based analyses of yield and spawning biomass per recruit for black sea bass *Centropristis striata*, a protogynous hemaphrodite. *Fish. Bull. (U.S.)* 91(2): 328-337.

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- SHERMAN, K.; Jaworski, N.; Smayda, T., editors. 1992. Summary of the Symposium on the Northeast U.S. Shelf Ecosystem: Stress, Mitigation, and Sustainability, 12-15 August 1991, University of Rhode Island, Narragansett, Rhode Island. *NOAA Tech. Memo. NMFS-F/NEC-94*; 30 p.
- SHERMAN, K.; Laughlin, T.L., editors. 1992. Large Marine Ecosystems Monitoring Workshop report, 13-14 July 1991, Cornell University, Ithaca, New York. *NOAA Tech. Memo. NMFS-F/NEC-93*; 22 p.
- SHERMAN, K.; Laughlin, T.L., editors. 1992. Report of the meeting of the *ad hoc* Committee on Large Marine Ecosystems, 22-23 March 1991, UNESCO Headquarters, Paris, France. *NOAA Tech. Memo. NMFS-F/NEC-92*; 19 p.
- SHERMAN, K.; Laughlin, T.L., editors. 1992. The large marine ecosystem (LME) concept and its application to regional marine resource management, 1-6 October 1990, Monaco: conference summary and recommendations. *NOAA Tech. Mem. NMFS-F/NEC-91*; 37 p.
- SMITH, T.; PALKA, D.; BISACK, K. 1993. Biological significance of bycatch of harbor porpoise in the Gulf of Maine demersal gillnet fishery. *Northeast Fish. Sci. Cent. Ref. Doc. 93-23*; 15 p.
- SMITH, T.P., editor. 1993. The Northeast Region Fisheries Data Needs Workshop, Gloucester, Mass., March 31 - April 1, 1993. *Northeast Fish. Sci. Cent. Ref. Doc. 93-22*; 31 p.
- SMITH, W.G.; MORSE, W.W. 1993. Larval distribution patterns: early signals for the collapse/recovery of Atlantic herring *Clupea harengus* in the Georges Bank area. *Fish. Bull. (U.S.) 91(2)*: 338-347.
- TERCEIRO, M., editor. 1993. Assessment of summer flounder (*Paralichthys dentatus*), 1993: report of the Stock Assessment Workshop Summer Flounder Working Group. *Northeast Fish. Sci. Cent. Ref. Doc. 93-14*; 72 p.
- WILK, S.J.; PIKANOWSKI, R.A.; PACHECO, A.J.; McMILLAN, D.G.; PHELAN, B.A.; STEHLIK, L.L. 1992. Fish and megainvertebrates collected in the New York Bight apex during the 12-Mile Dumpsite recovery study, July 1986 - September 1989. *NOAA Tech. Memo. NMFS-F/NEC-90*; 78 p.
- WILLIAMS, A.B. 1993. Comments on the proposed conservation of the specific names of *Gebia major capensis* Kraus, 1843 and *G. africana* Ortmann, 1894 (currently *Upogebia capensis* and *U. africana*; Crustacea, Decapoda) by the designation of a replacement neotype for *U. capensis*. (Case 2827; BZN 49: 187-190). *Bull. Zool. Nomencl.* 50(2): 143-144.

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