

Library

# NORTHEAST FISHERIES CENTER

## BIMONTHLY REPORT



United States Department of Commerce  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Northeast Fisheries Center  
Woods Hole, Massachusetts 02543

MAY-JUNE 1984

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The Northeast Fisheries Center's "Bimonthly Report" is an unedited compilation of reports by the Chiefs/Directors of the Center's nine major research programs, summarizing key research activities and publications/reports during the bimonthly period. This "Bimonthly Report" does not constitute a publication and is for information only. All data should be considered provisional. Reference to trade names does not imply endorsement.

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## AQUACULTURE DIVISION

### VITAMIN ENRICHMENT EFFECTS ON ALGAL CULTURE UNDER INVESTIGATION

Four algal species, *Tetraselmis maculata*, *Dunaliella tertiolecta*, *Pyramimonas grossi*, and unidentified pennate diatom strain D-828, that have demonstrated the ability to grow in medium from which vitamins have been excluded, are being studied. Initial growth curve experiments have demonstrated that the growth rates and final populations of these four species are reduced in the vitamin-deficient medium (ENV) as compared with the standard culture medium (E) to which the vitamins B<sub>12</sub> and thiamine are added. The chemical compositions of these algal species are also being investigated by analyzing for protein, lipid, and carbohydrate. Analyses for pigment composition of these species cultured in E or ENV have been completed, revealing no significant differences in pigment composition of *T. maculata*, *D. tertiolecta*, or *P. grossi* in the two media; however, differences were found in the diatom D-828. The spectrophotometric method used for pigment analysis differentiates between chlorophylls a, b, and c and total carotenoids; results obtained for *T. maculata* show good correlation with values reported for this species by Strickland and Parsons (1968) in their publication describing the procedure. A fluorometric method of pigment analysis is also being tested in our laboratory.

Cultures of the four algal species listed above in E and ENV media have been gradually increased in volume so that carboy cultures will soon be available for an oyster feeding study. Preliminary feeding experiments conducted in 1982 indicated that some algal species cultured in the vitamin-deficient medium induced better growth of juvenile oysters, *Crassostrea virginica*, than algae cultured in the standard E formulation. We plan to expand upon this research by including additional algal species in the current oyster feeding study, and by applying analytical procedures for nutritionally important constituents of the cultured algae. Contact: Dr. R. Ukeles (FTS 642-5223).

### OYSTER BREEDING: SELECTIVE AND HYBRID INITIATIVES IN PROGRESS

The founding generation of a second American oyster, *Crassostrea virginica*, selection experiment has been successively bred with roughly a million spat now being reared for the first generation of bi-directional selection for growth. Approximately 125 males and 125 females contributed gametes to this founding generation. To increase the base of genetic variability, non-selected wild parents were taken from 8 oyster populations from Maine to New Jersey.

Series of different-stage embryos from crosses of the Japanese, *Crassostrea gigas*, and American oysters treated to induce polyploidy in the hybrid zygote are being examined microscopically. This is to elucidate the chromosome events of maturation and fertilization which must

be controlled for useful commercial production of these and related oyster types. Further, the likelihood of using experimental manipulations of embryo cells in the context of shellfish breeding is being explored in addition to further work being done on parthenogenesis, androgenesis, and gynogenesis. Contact: Dr. A. Longwell (FTS 642-5207).

#### CHROMOSOME BANDING/DNA TECHNIQUES BEING DEVELOPED

Routine procedures are being developed for chromosome banding in fish and shellfish and for restriction fragment sizing of fish and shellfish DNA. Both procedures are new means of identifying and characterizing natural populations of resource species. The techniques as well may have applicability in assays of mutagenicity and biological effects monitoring, and are a step towards applying new biological technologies to aquaculture breeding. Contact: Dr. A. Longwell (FTS 642-5207).

#### VERTICAL AND HORIZONTAL WATER FLOWS PRODUCE EQUAL CLAM GROWTH

In 4 experiments with small hard clams, *Mercenaria mercenaria*, between 2 and 6 mm in length, growth was similar in raceways with horizontal water movement and in upflow columns with vertical flow. Upflow systems for growing oyster and clam seed are being used in many shellfish nurseries around the world, but little data are available comparing their performance with raceways. We found nearly identical growth of clams using both methods. At the ambient food levels present during these tests, water flow of 10 liters/minute for each liter of packed clams was necessary for normal growth, and increasing the flow rate up to 6-fold only slightly improved growth. Similar growth also occurred as the number of clams in the systems was increased so the overall carrying capacity of upflow columns and raceways is also alike. Both methods are effective for growing small clams, and the choice to use one or the other will have to be based on economic consideration of labor, space, and construction costs. Contact: Mr. E. Rhodes, Jr. (FTS 642-5226).

#### CLAM KILLER MAY BE A NONMOTILE VIBRIO

A shellfish pathogen isolated from dying clam larvae reared in a Long Island hatchery was found to adversely affect live-normal development of fertilized clam eggs at concentrations as low as 0.1 colony-forming units per milliliter of embryonic culture water. This extremely virulent microbe has characteristics quite similar to a nonvirulent *Vibrio* sp which was isolated in Maine several years ago. One major difference in the characteristics is that the present strain is nonmotile. Further studies are underway to test the hypothesis that the present strain is a mutant of the Maine isolate. Contact: Dr. C. Brown (FTS 642-5239).

## RAPID BACTERIAL IDENTIFICATION PROCEDURE PUT TO TEST

Bacteria isolated from a New England hatchery were used to test the effectiveness and repeatability of the Minitex miniaturized diagnostic system for rapid identification of marine bacteria. Initial data evaluation suggests that it may be more sensitive than the conventional method in identifying similar bacteria from numerous sources. Forty-one bacterial isolates from 12 sources also were screened for pathogenicity against larval clams. One of six isolates selected for more complete testing killed 50% of the test clam larvae at a dose of 0.47 bacteria per milliliter of larval culture (or 0.01 bacterium per clam larva). Thus the bacterium exhibits extremely high virulence. Other isolates were less virulent. All six pathogenic bacteria were found in cultures of clam larvae, but not in brood stock, food, or feed-water. Since sample volumes taken by plant personnel may have been insufficient to pick up low levels of bacterial pathogens, sampling of higher volumes is in progress. Contact: Dr. C. Brown (FTS 642-5239).

## PUBLICATIONS AND REPORTS

- Blogoslawski, W. J., and M. E. Stewart. 1983. Depuration and public health. *J. World Maricult. Soc.*, 14: 535-545.
- Longwell, A. Crosby. 1984. Some considerations on cell and recombinant DNA technology, mariculture, environmental and fishery biology. ICES Genetics Working Group paper presented at the Genetics Working Group meeting, St. Andrews, N.B., Canada, June 13-15.
- Longwell, A. Crosby, D. Perry, A. Hebert, and J. Hughes. 1984. Variable frequencies of chromosome mutation in embryo, juvenile and adult fish of resource species, and their marine environment. Presented at AAAS Symposium on the New York Bight and its Estuarine Ecosystems, May 24-29, New York City.

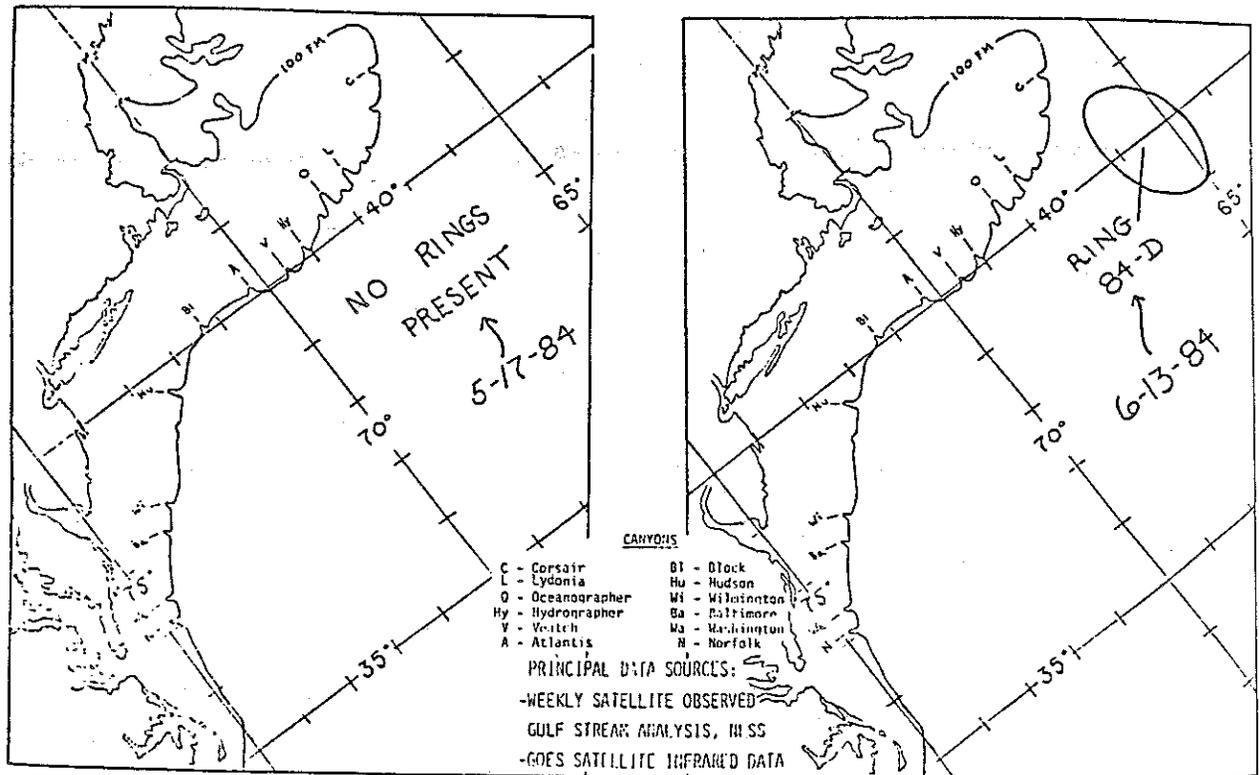
# ATLANTIC ENVIRONMENTAL GROUP

## SHIP-OF-OPPORTUNITY TEMPERATURE AND PLANKTON TRANSECTS

A total of 11 XBT (Expendable Bathythermograph) and 4 CPR (Continuous Plankton Recorder) Transects were occupied during May - June as follows: Gulf of Maine - 2 CPR and 2 XBT, Middle Atlantic Bight - 2 CPR and 4 XBT, Gulf of Mexico - 5 XBT, Contact: Steven Cook FTS 838-7142.

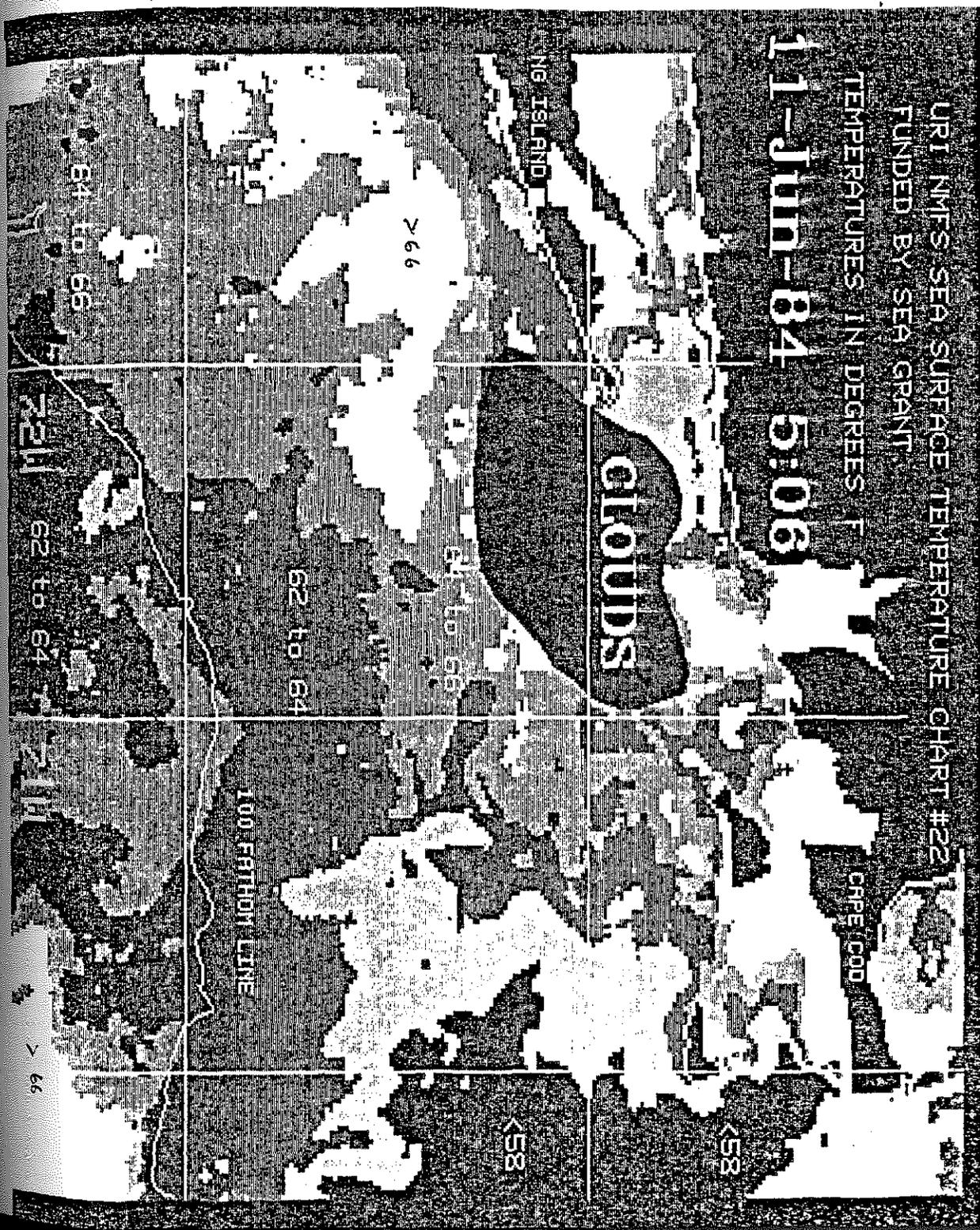
## GULF STREAM RING LOCATIONS

Announcements of Gulf Stream ring locations in mid-May and mid-June were sent to Commander, Atlantic Area, U.S. Coast Guard for publication in the June and July issues of the Atlantic Notice to Fishermen. Contact Reed Armstrong, FTS 838-7142.



Infrared Imagery Prepared for Southern New England Fishermen

The joint satellite data analysis effort between AEG and the University of Rhode Island produced 4 grey-scale images of sea-surface temperature in southern New England shelf waters from digital infrared data from the NOAA-7 satellite. The charts for 10 May, 22 May, 5 June and 11 June were distributed to fishing interests by the Marine Advisory Service of the University of Rhode Island, (see sample below). Anyone interested in receiving copies of these images should contact Sara Hickox of URI-MAS at 401-892-6482.



## ENVIRONMENTAL ASSESSMENT DIVISION

### RELATIONSHIP BETWEEN DIET AND GROWTH INVESTIGATED FOR JUVENILE BLUEFISH

Two years of field studies on the feeding and growth of juvenile bluefish in Sandy Hook Bay, New Jersey, have been completed recently by scientists of the Northeast Fisheries Center.

The investigators found a wide variety of fish and invertebrate taxa in bluefish stomachs. Bluefish which had high proportions of fish in their diet, however, tended to grow faster and be in better condition than those that did not. The availability of the silverside (*Menidia menidia*) in particular, appeared to be of critical importance in this regard. In a year of apparent low *Menidia* availability, bluefish were not able to effectively compensate by switching to alternate prey and slower growth resulted.

The ultimate effect of reduced first-year growth and condition on survival is not known. Results suggest, however, that the availability of certain prey types during this critical early life history stage could be one of several environmental factors which determine year class strength and eventual recruitment of young bluefish to the adult stock.

### FISH IN POLLUTED AREAS SHOW ADAPTIVE KIDNEY RESPONSE

During last summer's NEMP/OP monitoring cruise, 25-100% of the winter and windowpane flounders collected from sites highly subject to contaminant loading (New York Bight Apex, Buzzards Bay, Block Island Sound, and the mouth of Delaware Bay) had very high levels of kidney G6PDH, a marker enzyme for biosynthetic activity. High values indicate a stimulatory response to subinhibitory toxicant stress (hormesis). The condition is usually transient in fish that move away from polluted areas. In yellowtail, winter, and windowpane flounders, normal kidney G6PDH values range 35-70; values above 80 are considered high and those above 100, significantly so. At all stations cited above (except Buzzards Bay, where values in all flounders averaged a high 98), there were two clearly defined groups for each species: 50-75% were normal, ranging 38-59, and the high group ranged 103-142. No yellowtails were collected at these stations. The remaining "clean" stations produced all three flounder species (YT, W, WP) with normal values for this indicator enzyme (42-63), apparently having more uniform residence times. Earlier monitoring cruises have shown kidney G6PDH levels well over 100 in yellowtail flounder taken from sites near the mouth of the Merrimack River and off Race Point, in Massachusetts Bay.

## OCEAN QUAHOGS CHEMICAL CONTAMINATION STUDIED

The ocean quahog, *Arctica islandica* is becoming an important resource species in the Northeast. Because the species inhabits silty areas of the continental shelf where particulated contaminants are likely to accumulate, it was felt that this species may be at higher risk from contamination. A study recently completed, surveyed the PCB, polynuclear aromatic hydrocarbons (from both petroleum and combustion), total petroleum hydrocarbons and seven trace metals (Ag, Cd, Cr, Cu, Ni, Pb and Zn) in the tissues of this species between Virginia and Nova Scotia. Organic and trace metal residues were detected at low levels in all samples examined, with highest levels being generally found in samples from the inner New York Bight and Rhode Island Sound. PCB levels did not exceed 27 ppb, however.

## MARINE ECOSYSTEMS DIVISION

### FEWER SHARKS CAUGHT IN JUNE 1984

The Cooperative Shark Tagging Program and attendance at several tournaments in the Mid-Atlantic Bight by Narragansett scientists show a sharp decline in the number of sharks caught by sportsmen during June of this year. The catch of sharks at the annual Bay Shore, LI, Mako Tournament was markedly lower than in any year since the first June tournament in 1965. During the past several years, we have had over 1,000 blue sharks tagged off New Jersey and Long Island during June, but during 1984 the number was less than 300. The reason for the lower abundance of blue sharks inshore could be due to never before recorded amounts of rainfall in the northeast during May and early June. Oceanographic data shows that the fresh water runoff from the Hudson River, Delaware Bay, and Chesapeake Bay decreased the salinity of surface waters on the shelf out to 70-80 miles. In average years the influence of runoff extends to about 30 miles. Contact Jack Casey (401-789-9326 or FTS 838-7142).

### ATLAS ON MARMAP SURVEY EFFORT TO BE AVAILABLE.

The first in a series of atlas-like publications dealing with the MARMAP ichthyoplankton/zooplankton surveys is in the final stages of preparation and should be ready for review by late summer. It deals with survey coverage and includes station maps and tabular summaries of data collections from 47 surveys for the 7-year period from 1977 through 1983. Brief descriptions of sampling protocol are included for all aspects of the program. The second publication in the series is underway. It will include hydrographic information and distribution plots, and tables of abundance for the principal organisms representing different trophic levels. Contact Wally Smith (201-072-0200 or FTS 342-8260).

### LARVAL HADDOCK SURVIVAL LINKED TO THERMAL STRATIFICATION

Two experiments on growth and survival of haddock larvae in large microcosms under stratified and well-mixed conditions were completed in cooperation with the Marine Ecosystems Research Laboratory, GSO, URI. In both experiments larval haddock survived the 4-wk duration of the experiment only in the stratified tanks. The instantaneous mortality coefficients were 0.14 in the first experiment and 0.09 in the second. Growth rates in dry weight were 14% per day in the first experiment and 11% per day in the second. Contact Dr. G. C. Laurence (401-789-9326 or FTS 838-7142).

### US-POLISH COOPERATIVE LONGLINE CRUISE COMPLETED

In May, the Apex Predators group completed a 23-day longline cooperative cruise aboard the RV *Wieczno* in the area of the Gulf

Stream, Sargasso Sea, and shelf waters off the Mid-Atlantic Bight. Over 600 fish taken during the cruise were sampled for biological studies, primarily on age and growth and reproduction, and part of the catch was tagged for migration studies. A report from the cruise was presented as a Working Document at the recent NAFO meetings in Halifax. Contact Jack Casey (401-789-9326 or FTS 838-7142).

#### FIRST IN SERIES OF JUVENILE FISH RESEARCH CRUISES COMPLETED

The first cruise in a series of the Center's new focus on mortality processes during the post-larval, early juvenile period of cod, haddock, and yellowtail flounder was successfully completed. During Juvenile Fish Survey--*Albatross IV* 84-05, 11-22 June 1984, the entire Georges Bank area extending across the Great South Channel was surveyed with 93 MOCNESS-10 (3-mm mesh) hauls. Shipboard sorting of the samples showed young cod (15-25 mm) were mostly found in the shoal area of Georges (<60 m bottom depth) with highest densities (40-50/10,000 m<sup>3</sup>) in a narrow band along the southeast part (30-60 m bottom depth). Haddock (15-20 mm) were found mostly on the shoal (<60 m) western half of Georges Bank extending across the Great South Channel but at lower densities than cod except for one high station (119/10,000 m<sup>3</sup>) on Little Georges. Yellowtail (10-20 mm), which spawn the latest of the three species, had highest concentrations (10-50/10,000 m<sup>3</sup>) along the southern flank of Georges Bank extending across Little Georges and the northern part of the Great South Channel. Site studies were made to investigate their diurnal vertical distribution, food habits, and predator-prey relations by alternately deploying MOCNESS, Boothbay Depressor Trawl, 36' YANKEE Bottom Trawl (with cookies), and the IYGPT midwater trawl. Extensive collections of fish were specially preserved for analysis of age and growth, RNA/DNA content, disease and parasites, and monoclonal antibodies. Contact Dr. R. G. Lough (617-548-5123 or FTS 840-1290).

#### PUBLICATIONS AND REPORTS

- Jeffries, H. P., M. S. Berman, A. D. Poularikas, C. Katsinis, I. Melas, K. Sherman, and L. Bivins. 1984. Automated sizing, counting and identification of zooplankton by pattern recognition. *Mar. Biol.* 78:329-334.
- Laurence, G. C., J. R. Green, P. W. Fofonoff, and B. R. Burns. 1984. Small-scale spatial variability of plankton on Georges Bank with particular reference to prey organisms of larval cod and haddock. *ICES C.M.* 1984/L:9.
- Lough, R. G. 1984. Larval fish trophodynamic studies on Georges Bank: sampling strategy and initial results. In: E. Dahl, D. S. Danielssen, E. Moksness and P. Solemdal (Editors), *The Propagation of Cod *Gadus morhua* L.* Flødevigen rapportser., 1, 1984:395-434.

McKenney, T. W., E. J. Johnson, and A. Wells. 1984. Distribution and abundance of *Citharichthys arctifrons* larvae in shelf waters off the northeastern United States, 1977-1982. ICES C.M. 1984/G:31.

Medved, R. Gastric evacuation in the sandbar shark (*Carcharhinus plumbeus*). J. Fish. Biol. (in press).

Schlitz, R. J., and E. B. Cohen. 1984. A nitrogen budget for the Gulf of Maine and Georges Bank. Biol. Oceanogr. 3:203-222.

Sherman, K., R. Lasker, W. Richards, and A. W. Kendall, Jr. 1983. Ichthyoplankton and fish recruitment studies in large marine ecosystems. Mar. Fish. Rev. (10-12):1-25.

## NATIONAL SYSTEMATICS LABORATORY

### TAXONOMIC STATUS OF MACKEREL AND TUNA-LIKE FISHES

The taxonomic status of the suborder Scombroidei, the group of fishes including the mackerels, bonitos, tunas, billfishes, and their relatives was summarized at the 35th Annual Tuna Conference in Lake Arrowhead, California, in late May by Bruce B. Collette. The suborder contains 6 families, 44 genera, and nearly 100 species. Taxonomic problems were identified in 4 families: Gempylidae (snake mackerels), Trichiuridae (cutlass fishes), Istiophoridae (sailfish and marlins), and Scombridae (mackerels and tunas). Atlantic and Indo-Pacific populations of blue marlin (Makaira nigricans) and sailfish (Istiophorus platypterus) differ, but it is not clear whether the differences are specific or subspecific. Most species of Scombridae seem well-defined but there are problems in the systematic placement of Gasterochisma and Grammatorcynus. The only species problem concerns the frigate tunas (Auxis). The two Indo-Pacific species are well-defined but the status of the Atlantic species is not yet clear; are there one or two species, and are these the same as in the Indo-Pacific? Contact Dr. Bruce B. Collette (202-357-2524).

### SYNOPSIS OF BIOLOGICAL DATA ON BLUE CRAB PUBLISHED BY NMFS

The first number of the new NMFS Technical Report series which combines the old Special Scientific Reports - Fisheries and the Circulars is a synopsis of biological data on the blue crab, Callinectes sapidus. This publication is also no. 138 in the FAO Fisheries Synopsis Series. It reviews information on the species from over 300 reports published through 1982: taxonomy, morphology, distribution, life history, commercial hard and soft crab fisheries, physiology, diseases, ecology, laboratory culture methodology, and influences of environmental pollutants on the species. The most recent reported landings and value for this species (1983) were 191.7 million lbs. and 55.1 million dollars. The report is co-authored by M. R. Millikan, formerly of the Charleston Laboratory of the Southeast Fisheries Center and A. B. Williams of the National Systematics Laboratory, Contact Dr. Austin B. Williams (202-357-2639).

### IDENTIFICATION OF SPINY LOBSTERS

The average annual world catch of lobsters, 1975-81, was approximately 404 million lbs. of which 44% were clawed lobsters, mainly from the North Atlantic, 19% were galatheids from the east Pacific, and 36% were spiny and flat lobsters from tropical, subtropical and southern temperate waters of the world ocean. Domestic landings of spiny lobsters averaged 6.7 million lbs. annually, 1974-83, but that amount was dwarfed by imports of 41.4 million lbs. of the frozen and canned meats of several species.

Totals of spiny lobsters imported during that period represent approximately 1/3 of the average annual world landings for those species. Many of these imported species are difficult to identify because they are imported as tails, without the carapace and legs that provide many useful taxonomic characters. To allow customs inspectors, importers, and suppliers to the Department of Defense to properly identify the imports (and ascertain whether the species are of American origin), work was initiated on producing illustrated keys for the identification of all species of lobsters that are prominent in U. S. trade as well as species that occasionally are found in markets or that have potential commercial value. The keys and illustrations represent the species as they may be seen in fresh or frozen state in U. S. markets. No such publication tailored for general use is presently available. A draft manuscript and keys have been prepared. Colored pictures of the tails of 20 species have been taken but those of several species from the Indo-Pacific and west African regions are still needed. These should be photographed in our laboratory. Contact Dr. Austin B. Williams (202-357-2639).

#### PUBLICATIONS

- Millikan, M. R. and A. B. Williams. 1984. Synopsis of biological data on the blue crab Callinectes sapidus Rathbun. NOAA Tech. Rept. NMFS 1, 39 p.
- Williams, A. B. 1984. Shrimps, lobsters, and crabs of the Atlantic Coast of the United States, Maine to northern Florida. Smithsonian Inst. Press, 350 p.

## PATHOBIOLOGY DIVISION

### MARINE FISH VIROLOGY: COOPERATIVE EFFORT EXPANDS KNOWLEDGE OF IMPORTANT VIRUS GROUP AND PROVIDES POTENTIAL PRACTICAL APPLICATION

Our cooperative studies with the U.S. Fish and Wildlife Service, National Fish Health Research Laboratory at Leetown, WV, have resulted in the isolation of a new strain of virus, a potential vaccine for use in aquaculture, and new information on the taxonomic relationship between several diverse strains of infectious pancreatic necrosis virus (IPNV) from marine and freshwater fishes.

The new strain of IPN virus, designated the flounder strain, has been isolated on three separate occasions from southern flounder and has also been found in hogchoker, spot, and Atlantic silversides. Surprisingly, cross-neutralization studies have shown this strain to be most closely related to a European strain of IPNV. It shows little affinity to the North American salmonid or clupeid strains.

The flounder isolate may prove to be a useful vaccine against the virulent salmonid strain (VR299) of IPNV. In several experiments challenging 23-day-old brook trout (the fish most susceptible to IPNV), 89.5% were killed by the VR299 strain, 73.4% by the striped bass strain, 68.7% by the menhaden strain, but only 8.2% by the flounder strain. When the survivors of the flounder strain challenge were exposed to the virulent VR299 strain, over 90% survived the challenge.

Gross-neutralization studies of the flounder isolate and a new striped bass isolate from the University of Maryland have been completed. The flounder strain is most closely related to the European Ab strain. The striped bass isolate seems most closely related to the menhaden strain. Both the striped bass and menhaden viruses are similar to the most virulent VR299 strain. (Newman, 301-226-5193).

### INTERNATIONAL DIAGNOSTIC SERVICES

In cooperation with the Ministry of Agriculture, Food and Fisheries (MAFF), U.K., a sample of oysters (*Crassostrea virginica*) from the Tred Avon River was shipped to the MAFF Laboratory in Weymouth, England.

Even though these oysters were from a population that has been closely monitored for parasites and pathology for many years, additional samples were examined prior to their being shipped to England. A similar examination will be conducted at the Weymouth Laboratory, and the oysters will be held in a quarantine facility at the Conwy Laboratory while they are being studied. This movement of oysters is in compliance with the ICES guidelines on the transfer and introduction of exotic species. (F. Kern, 301-226-5193)

### OCEAN PULSE-AMPHIPOD STUDY

Detailed study has been completed of nearly 300 dinoflagellate infections in 13 species of benthic amphipods collected on Ocean Pulse cruises. Most of the infections were of organisms most like the genus *Hematodinium*, which infects crabs, including the blue crab. Two groups, one of them probably consisting

of three or more species, were causative agents in the infections. A paper is currently being written that describes the parasites, their developmental cycles, and their relationships with the amphipod hosts. Contact P. Johnson

#### SOFT CLAM NEOPLASMS

Considerable interest has developed in pursuing studies on proliferative cell conditions in soft shell clam populations from the Northeast region of the United States. Cooperative studies with the States of Maine, Massachusetts, New Jersey, and Maryland are being formulated in attempts to understand more about these unusual abnormalities in this commercially important resource and their relationship to clam population dynamics. At the most recent meeting with State officials of Maryland, a comprehensive State/Federal program was discussed and it is anticipated, by mid-July, that this program will be implemented. The State of Maryland anticipates support from the 88-309 State/Federal program. State activities will concentrate on epizootiological studies; i.e., the relationship of this disease to mortalities. Federal studies will concentrate on contractual research with the New England states and universities as they relate to improving and confirming our diagnostic systems. Contact, A. Farley.

## RESOURCE ASSESSMENT DIVISION

### BOOM AND BUST FOR THE YELLOWTAIL FLOUNDER FISHERY

Recent landings of yellowtail flounder have dropped significantly. According to the Northeast Regional Office's *Fishery Market News Report* issued out of Boston, 1984 landings--as of May 25--are 41 percent below the corresponding 1983 total. This apparent turnaround comes at the heels of a rapid expansion in the fishery wherein total annual landings increased 112 percent between 1981 and 1983. Southern New England landings increased from 4,900 tons in 1981 to 10,300 tons in 1982 to 17,000 tons in 1983. Georges Bank landings increased from 6,400 tons in 1981 to 10,600 tons in 1982 and 11,400 tons in 1983.

Increased 1982 and 1983 landings for these areas resulted both from recruitment of the strong 1980 year class, which accounted for over 50 percent of the total number landed in 1982, and from removal of quotas under the Interim Management Plan for Atlantic Groundfish. However, fishing mortality was very high during 1982 and 1983, and more recent year classes appear to be weaker than the 1980 year class, hence the recent drop in landings. Large quantities of 1980 year-class fish also appear to have been discarded during recruitment of that year class to the fishery in 1982, resulting in significant losses in yield and spawning potential. Contact Margaret McBride (FTS-840-1246 or 617-548-5123).

### VOLUNTARY PARTY BOAT LOGBOOKS LOOK PROMISING

A voluntary logbook system for collecting party boat fishery data was cooperatively developed during summer 1983 by the Interstate Party Boat Association and the Center, and implemented on a trial basis during a five-week period in autumn 1983, to evaluate the merits of such a system in documenting party boat-gillnet interactions. A report recently completed by Center scientists indicates that the data collected were of high quality and broad utility in documenting party boat-gillnet interactions and in evaluating resource and fishery conditions. The data enabled resource analyses to be performed which would otherwise have been impossible. Contact Dr. Fredric Serchuk (FTS-840-1245 or 617-548-5123).

### CENTER ASSESSMENT SCIENTIST ELECTED PRESIDENT OF NORTHEASTERN DIVISION AFS

Dr. Fredric M. Serchuk was voted President-Elect of the Northeastern Division of the American Fisheries Society (AFS) and installed during its May 14-16 1984 Annual Meeting at Ocean City, Maryland. AFS, founded in 1870, is the oldest and largest professional society representing fisheries scientists. It promotes scientific research and enlightened management of aquatic resources for optimum use and enjoyment by the public. It likewise encourages a comprehensive

education for fisheries scientists and continuing on-the-job training. Contact Dr. Fredric Serchuk (FTS-840-1245 or 617-548-5123).

#### NORTHERN SHRIMP FISHERY CONTINUES COMEBACK

Gulf of Maine northern shrimp landings for the December 1983-April 1984 season totaled approximately 3,000 metric tons or 6.5 million pounds. This figure represents the highest total since 1975 and is double the 1982-1983 average (1,500 tons or 3.2 million pounds). This increase is thought to reflect both increased abundance (as evidenced by NEFC surveys) and a general coast-wide increase in fishing effort. For Maine, the number of vessels fishing for shrimp peaked at 238 in February of 1984 as compared to 164 in 1983, while for Massachusetts the total peaked at over 40 vessels in 1984 as compared to 25 in 1983. Contact Dr. Stephen Clark (FTS 840-1243 or 617-548-5123).

#### PUBLICATIONS AND REPORTS

- Anthony, V., and M. Fogarty. 1984. Environmental effects on recruitment, growth and vulnerability of Atlantic herring in the Gulf of Maine region. In press. Can. J. Fish. Aquat. Sci.
- Anthony, V., A. Lange, and J. Boreman. 1984. Review of Atlantic salmon fisheries of the Northwestern Atlantic. NEFC, Woods Hole Lab. Ref. Doc. No. 84-12, 48 p.
- Boreman, J., and F.P. Almeida. 1984. Summary and interpretation of catch statistics for Atlantic salmon, 1983. NEFC, Woods Hole Lab. Ref. Doc. No. 84-15, 14 p.
- Boreman, J., W.J. Overholtz, and M.P. Sissenwine. 1984. A preliminary analysis of the effects of fishing on shortnose sturgeon. NEFC, Woods Hole Lab. Ref. Doc. No. 84-17, 16 p.
- Sargent, W., and J. Boreman. 1984. Bluefish: biology and management along the Atlantic Coast. NEFC, Targeted Information Series, 6 p.
- Serchuk, F.M. 1984. Fishing patterns and management measures regulating size at capture in the Georges Bank sea scallop fishery: A brief historical review. NEFC, Woods Hole Lab. Ref. Doc. No. 84-11, 10 p.
- Serchuk, F.M., and T.S. Burns. 1984. Results of the Interstate Party Boat Association-Northeast Fisheries Center Voluntary Party Boat Logbook Program Pilot Study, October 1983. NEFC, Woods Hole Lab. Ref. Doc. No. 84-10, 16 p.

## RESOURCE UTILIZATION DIVISION

### THE SODIUM CONNECTION

Brine dipping of fresh cut fillets is a common practice in some fish plants in the northeast. In view of the increased awareness of sodium content of foods, a study has been initiated to determine the effect of several variables on uptake of salt (sodium) in brined fillets. In phase 1, we are examining one day post-mortem scrod cod fillets dipped in 10 percent brine solution for different times. Consumer preference is also being determined by sensory evaluation.

### NOAA STATUS AND TRENDS FOLLOW-UP

The entire detailed existing procedure for the analysis of marine sediments and fish tissue developed by NOAA's National Analytical Facility including calibration of silica gel and sephadex columns for polynuclear aromatic hydrocarbons, polychlorinated biphenyls, and chlorinated hydrocarbons was run for fish and sediments. Yields for polynuclear aromatic hydrocarbons averaged 33%. It will now be necessary for someone to observe and receive additional training on this new procedure to work in cooperation with NAF's Seattle chemists and learn all the idiosyncrasies of the method in order for us to proceed on suitable test extracts and/or interim reference materials before the standard analyses can begin for the Status and Trends Program.

### INDUSTRY TECHNICAL WORKING GROUPS

We have distributed proposed U.S. Standards for Grades and draft instructions to relevant Industry Technical Working Groups. They concern fresh or frozen fish steaks, fresh or frozen fish fillets, fillet blocks, mixed fillet-minced fish blocks, minced fish blocks, frozen fish portions, raw clams, fresh and frozen freshwater catfish and fresh and frozen shrimp.

### CODFISH STABILITY

The experiment to determine the frozen storage stability of cod that had been stored on ice for 1, 6, and 9 days has been completed. All the frozen samples stored at +10°, 0°, and -10°F, including the 1 day iced sample stored at -10°F, were rated as unacceptable after 12 months of frozen storage. Instron texture and Hunter L color measurement data will be tabulated to determine if changes in the texture and color can be determined instrumentally. Correlation between instrument measurements and taste test panel results will be attempted.

### INTERNATIONAL TOW TANK CALIBRATION

Using one-seventh scale model shrimp trawls and doors provided by the NMFS Pascagoula Laboratory, the Fisheries Engineering Group has been running tests in the URI tow tank to compare model trawl measurements made in a tow tank with those made in the SFIA flume tank in Hull, England. The model trawls were built and tested at the flume tank in Hull, and this opportunity for intercalibration of the tanks will be very helpful for future comparisons of models tested at the two facilities.