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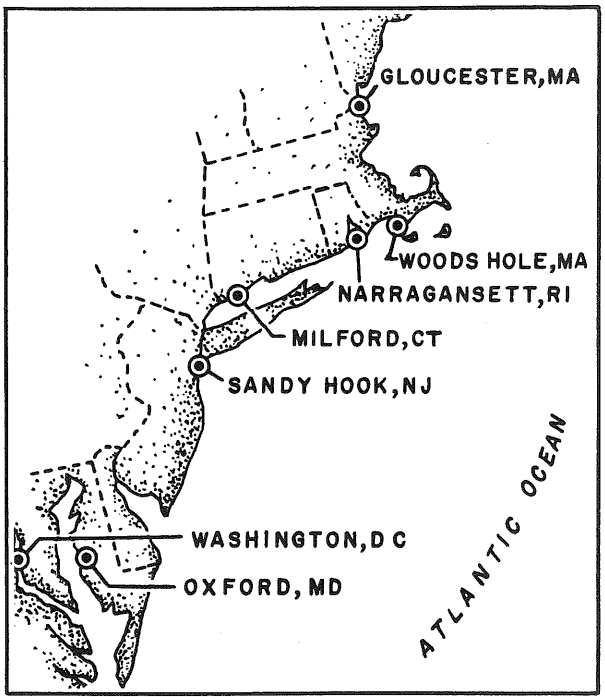
Northeast Fisheries Center

NEWS



JULY 1980

US DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

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NATIONAL MARINE FISHERIES SERVICE
NORTHEAST FISHERIES CENTER
WOODS HOLE, MASSACHUSETTS

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SUBMISSIONS TO THE "NEFC NEWS" ARE PREPARED BY THE AFOREMENTIONED RESEARCH ADMINISTRATORS, AND COMPILED AND EDITED BY JON A. GIBSON, TECHNICAL WRITER-EDITOR, NEFC.

CENTER DIRECTORATE

Fisheries Utilization Office

The Armed Forces Product Evaluation Committee (AFPEC), composed of members of the Army, Navy, Marines, and Air Force, meet periodically to evaluate new food products offered by industry for military use. Members of the Gloucester Laboratory have often acted as technical advisors to AFPEC when specific seafoods have been under consideration.

On 9 July, John Ryan of the Gloucester Laboratory staff hosted part of a meeting of AFPEC, and the seafoods under consideration were products prepared from red crab, ocean quahog, long-finned squid, Atlantic herring, blue mussels, red hake, goosefish, and minced fish. All products were rated highly, and we infer from that that they will be given serious consideration for military procurement.

Special Scientific and Technical Investigations Office

Technical Project Coordination

Construction continued on the Woods Hole pier. All of the main pier piles have been driven and the electrical details have been finalized. Work is on schedule with completion of all work planned for 1 November.

A plan was drafted for reviewing the status of the main laboratory building at Woods Hole. A multiphased engineering study is to be conducted involving strucural analysis, an energy audit, and specifications for energy conservation improvements.

Ronald Smolowitz was appointed as the NEFC representative on the NMFS Engineering Advisory Panel. The first meeting was a conference call which resulted in a charter. Also, a report on the status of the NEFC's fisheries engineering research and development program was prepared.

Work continued on analyzing the data on gear selectivity from the May-June sea scallop cruise. A meeting was held on bottom trawl survey gear problems and a task force was formed to review the matter. Assistance was provided in preparing for the upcoming surf clam-ocean quahog survey cruise.

RESOURCE ASSESSMENT DIVISION

Resource Surveys Investigation

During July, Tom Azarovitz and Chuck Byrne continued working on the final report for the US Bureau of Land Management contract. Substantial progress was made and this report should be completed in the near future.

Warren Handwork completed preparing #36 Yankee otter trawls for use on the summer bottom trawl survey.

The summer bottom trawl survey started on 11 July aboard the NOAA R/V Delaware II. The area between Cape Fear, North Carolina, and central New Jersey was surveyed during the first leg. Linda Despres was the chief scientist. This leg was completed on 25 July when the Delaware II returned to Woods Hole. On 28 July, with Malcolm Silverman as chief scientist, the summer survey continued as the Delaware II departed Woods Hole and headed to where the first leg ended. On 28 July, the NOAA R/V Albatross IV departed Woods Hole to conduct the third leg of the summer survey. Henry Jensen is chief scientist and the Gulf of Maine is the targeted survey area.

Early in August, both vessels are scheduled to rendezvous near the Northeast Peak on Georges Bank to conduct a vessel fishing power comparison experiment.

Jim Crossen and Ambrose Jearld attended and observed a hydroacoustic experiment on target-strength measurements by the Norwegian Institute of Marine Research/Bergen University at Sotra, Norway. The experiment consisted of insonifying Atlantic herring, saithe, and pollock (single fish and aggregations) through a frequency range of 38, 50, 70, and 120 kHz.

Fishery Biology Investigation

During 1-3 July, Dr. Ambrose Jearld accepted an invitation from Dr. James Arrington, Chairman of the South Carolina State College Department of Biology, to give a slide presentation on NMFS, to discuss with students the broad career opportunities in marine-related occupations in scientific, professional, and technical fields, and to counsel students individually. The students are enrolled in a marine science course and are from three historical black South Carolina state colleges -- Benedict College, Voorhees College, and South Carolina State College. The program is part of a Sea Grant project between the University of South Carolina and South Carolina State College. The course is offered at the Penn Center Community Campus in Frogmore on St. Helena Island.

During 9-12 July, Ambrose participated in a hydroacoustics research project conducted by scientists from Bergen University/Norwegian Institute of Marine Research.

Shellfish

Maurice Crawford and Maureen Griffin spent most of the month determining ages of surf clams from photographic prints of the sectioned chondrophores. The samples were from the Delaware II Cruise No. DE 78-07. Maureen Griffin prepared a data sheet for recording observations and use by the Woods Hole Laboratory Automatic Data Processing (ADP) Unit. Mark Costa assisted in sectioning clam chondrophores collected on Delaware II Cruise No. DE 80-01. He is to be commended for his skill in processing small clam specimens and developing the ability to section the precise portion of the chondrophore needed for examination. Carol Dion of Marion, Massachusetts, volunteered to assist in our clam aging work. She was particularly helpful in recording and organizing data and photographic prints, but did some chondrophore sectioning too.

John Ropes prepared prints of ocean quahogs recovered 1 yr after marking to observe growth. The materials are for use in a manuscript on the effects of marking and shell deposition after marking. He also is preparing a manuscript on "Size and Age at Sexual Maturity of Ocean Quahogs, Arctica islandica Linné; from a Deep Oceanic Site," by J. W. Ropes and S. A. Murawski, for presentation at an upcoming International Council for the Exploration of the Sea (ICES) meeting. The manuscript has been extensively reviewed and is being prepared for final typing.

With respect to the renovation of the cottage used by the Investigation at the Woods Hole Laboratory, the outside white part of the building was painted; however, the windows are not yet done. No other progress has been made on inside renovation.

Finfish

In July, Brenda Fields completed age determination of 1979 commercial summer flounder samples. She summarized commercial age/length data for 1978 and 1979.

Cathy Rearden completed sectioning red hake otoliths for the 1979 summer bottom trawl survey and began the 1980 spring survey. She and Louise Dery completed 1979 New Jersey recreational bluefish scale back-calculations and age/length summaries.

Louise Dery aged and summarized 1980 spring bottom trawl survey Atlantic mackerel samples. The 1980 New Jersey recreational and commercial mackerel samples were processed, aged, and summarized. Atlantic herring samples from the 1980 spring survey were also processed.

Several comparative aging studies were completed this month. Bluefish scale samples from Lyman Barger (NMFS Panama City [Florida] Laboratory) were impressed and aged. A large sample of alewife otoliths from Anne O'Hara (Massachusetts Division of Marine Fisheries) was aged and areas of disagreement were analyzed.

Age and Growth

Kris Andrade completed aging commercial haddock samples for the first and second quarters of 1980.

Vi Gifford began aging commercial redfish samples for the second quarter of 1971.

Judy Penttila checked aging done by the Atlantic cod age reader for the Massachusetts Division of Marine Fisheries, Doris Jimenez. Cod age samples from the fall bottom trawl survey, Delaware II Cruise No. DE 79-10 and Albatross IV Cruise No. AL 79-12, were checked for accuracy. Judy also reviewed the final report prepared by Cambridge Instrument Co. on "Development of ... a Software Program for Automatic Image Analysis of Fish Scales from Haddock."

Nine marine biology students from Bridgewater State College were given a tour of our operations on 18 July.

Sandy Hook Investigation

Darryl Christensen and John Clifford continued work on a manuscript of the 1975-77 charter and party boat survey conducted in New Jersey. Darryl also participated on a bottom trawl survey aboard the Delaware II.

Stu Wilk and Erin Feeney continued work on a manuscript describing the historical and present exploitation of the weakfish, Atlantic croaker, and spot along the US East Coast and Gulf Coast. The aforementioned manuscript will be presented at the annual Marine Recreational Fisheries Symposium to be held in Houston, Texas.

Stu Wilk completed a working draft of a manuscript titled "Fishing for Fun" which will be included in "Living Resources of the Coastal Sea", a special issue of the American Littoral Society's Underwater Naturalist.

Wally Morse and Toni Morris completed the preliminary analysis of Georges Bank haddock maturity data from research cruises during 1968-79. The statistical analysis is nearing completion for the historical haddock fecundity data. Wally is continuing on the manuscript describing summer flounder reproduction.

Fishery Assessment Investigation

Members of the Investigation have been preparing material for the annual "Status of the Stocks" report. Gordon Waring was aboard the Soviet Union's R/V Evrika during 3-12 July for a food habits study on winter flounder, yellowtail flounder, and fourspot flounder. Harold Foster went on the first leg of the summer bottom trawl survey on the Delaware II. Harold is also auditing first quarter length

frequencies from commercial samples. Steve Murawski is writing a review article on offshore bivalve resources in the Northeast Region. Steve also developed sampling plans for the August surf clam - ocean quahog survey. Margaret McBride, Dennis Hansford, and Mike Sissenwine are planning a Co-op recruiting workshop for October. Frank Almeida worked on updating silver hake and red hake assessments.

Senior Assessment Scientists

Mike Sissenwine and other members of the Resource Assessment Division were involved in preparing the NEFC's 5-yr strategic research plan for conservation and management. The plan calls for improved monitoring of resource survey gear performance, increases in fishery statistics and sea-sampling trips, and studies of trophic dynamics, fishery ecology, and recruitment processes. Brad Brown participated in developing procedures for preparing resource assessment data for use by consultant firms dealing with oil drilling on Georges Bank, and in preparation of resource survey cruise material for use at the International Ecology Workshop in Trieste, Italy. Steve Clark is working on a manuscript on assessment and management of northern shrimp in the Gulf of Maine and is drafting a paper on Georges Bank and Gulf of Maine haddock for an upcoming meeting of the American Fisheries Society (AFS). A total of five papers are being prepared for the AFS meeting in September by assessment personnel. Steve also reviewed several manuscripts and two State of Maine research projects on northern shrimp.

The senior assessment staff updated the "Status of Knowledge for Fishery Management" tables and are busy preparing this year's "Status of the Stocks" report which will be published in the new NOAA Technical Memorandum series.

University and Research Institute Relations

A package for joint ocean quahog research has been planned with the Canadian Plant and Invertebrate Research Group, Ltd., in Halifax, Nova Scotia. Brad Brown, Tom Azarovitz, and Steve Murawski participated. Proposed projects include joint survey work and biological studies.

Brad Brown and Joan Palmer conferred with G. P. Patil's group from the Institute of Statistical Ecology at Pennsylvania State University concerning contract research on statistical distributions as applied to fishery assessment.

Mike Sissenwine attended a conference in Providence, Rhode Island, at which the Northeast Fishery Management Task Force met with the faculties of the University of Rhode Island (URI), the Woods Hole Oceanographic Institution (WHOI), the University of Delaware, and the University of Maine.

Gordon Waring obtained data on distribution of larval Atlantic herring in coastal Massachusetts waters based on the Massachusetts Division of Marine Fisheries' spring survey of young-of-the-year winter flounder.

Meetings, Talks, Visitors, and Publicity

On 1 July in Philadelphia, Emory Anderson and Stu Wilk attended the Scientific and Statistical (S&S) Committee meeting of the Mid-Atlantic Fishery Management Council (MAFMC).

On 1 July in Woods Hole, the Laboratory Equal Employment Opportunity (EEO) meeting was attended by Steve Clark and Margaret McBride.

During 1-11 July in Copenhagen, Vaughn Anthony participated in the meeting of the ICES Advisory Committee for Fisheries Management reviewing stock assessments and formulating management advice for Eastern Atlantic stocks.

On 7 July, Brad Brown, Tom Azarovitz, and Steve Murawski met with Tisa Amarmatunga and Terry Rowe of the Canadian Plant and Invertebrate Research Group, Ltd.

On 8 and 9 July in Gloucester, Massachusetts, Steve Clark chaired a meeting of the State-Federal Northern Shrimp Scientific Committee to draft proposals for future northern shrimp surveys and related work.

During 9 July - 1 August in Trieste, Italy, Joan Palmer attended the International Ecology Workshop on Statistical Distributions. On 18 July, Joan chaired the session on mixtures of distributions. Brad Brown attended the Workshop from 18 to 27 July.

On 24 and 25 July in Woods Hole, Mike Sissenwine attended the Center Board of Directors meeting.

On 25 July in Dover, Delaware, Steve Murawski discussed ocean quahog growth studies at the MAFMC's Surf Clam - Ocean Quahog Sub-Panel meeting.

On 29 and 30 July, Stu Wilk attended the Estuarine Sampling Gear Workshop at the Virginia Institute of Marine Science in Gloucester Pt., Virginia.

On 30 July in Woods Hole, Brad Brown, Mike Sissenwine, Tom Azarovitz, Steve Murawski, Herb Stern, and Mary Laird met with Terry Rowe and administrative support people from the Canadian Plant and Invertebrate Research Group, Ltd.

On 30 and 31 July in Portsmouth, New Hampshire, Steve Clark attended the New England Fishery Management Council meeting and also a meeting of the Northern Shrimp Sub-Board.

Stu Wilk and Darryl Christensen gave a presentation on "Marine Recreational Fishing in the Mid-Atlantic" before a group of 60-80 scientists, administrators, and students affiliated with New Jersey Marine Sciences Consortium and National Park Service at the Sandy Hook Laboratory.

Publications

Murawski, S. A.; Ropes, J. W.; Serchuk, F. M. Growth studies of the ocean quahog, Arctica islandica. Fish. Bull. (US). (S)

Wilk, S. J. Biology and ecology of the weakfish, Cynoscion regalis (Bloch and Schneider). In Proceedings of the colloquium on the biology and management of red drum and seatrout. Gulf States Mar. Fish. Comm., Spec. Publ. No. 5;1980. 13 p. (P)

Wilk, S. J.; Smith, W. G.; Ralph, D. E.; Sibunka, J. Population structure of summer flounder between New York and Florida based on linear discriminant analysis. Trans. Amer. Fish. Soc. 109(3):265-271;1980. (P)

Reports

Murawski, S. A. Recovery of surf clam, Spisula solidissima, populations off New Jersey. Coast. Oceanogr. Climatol. News.

MANNED UNDERSEA RESEARCH AND TECHNOLOGY PROGRAM

No report received. The April, May, June, and July reports might be included in the August issue.

MARINE ECOSYSTEMS DIVISION

Larval Fish Dynamics Investigation

Experimental Studies

The last group of striped bass fry from the Buchanan Hatchery on the Hudson River were reared to 60 days after hatching, photographed, and frozen. This completed the rearing portion of the 1980 joint NMFS-US Fish and Wildlife Service (USFWS) study on the effects of existing contaminant burdens on the viability of striped bass eggs and larvae. All fry sampled through day 21 have been analyzed for RNA, DNA, and protein content, including almost 1000, 21-day-old fry which were freeze dried and weighed before chemical analysis of individual fry.

Sorting of the microdistribution samples from Evrika Cruise No. 80-02 was begun.

Larry Buckley gave a presentation of the task's Northeast Monitoring Program (NEMP) activities to a meeting of the NEMP management team at the Narragansett Laboratory.

Thomas Halavik and Larry Buckley attended supervisory training courses.

Population Processes

Analysis of the larval Atlantic herring abundance and mortality estimates (derived from the time-series data collected through the International Commission for the Northwest Atlantic Fisheries [ICNAF]) was continued by George Bolz and Greg Lough for the 1971-77 seasons (35 surveys included). Night/day comparisons of larval catches showed the same general pattern for all seven seasons. Night-to-day abundance ratios were essentially unity (1:1) for the 7-20 mm larval length classes where >90% of the data are represented. The ratios increased linearly to about 5:1 for 20-30 mm larvae and departed significantly from this pattern for >30 mm larvae.

Roz Cohen and Greg Lough completed a manuscript on a comparison of reported length-weight relationships for the dominant prey of larval Atlantic herring. Roz Cohen, Greg Lough, and Janet Murphy have nearly completed a data report on larval herring gut content and morphological condition data from three spawning seasons (1974, 1975, 1976) in the Georges Bank - Gulf of Maine area. Another draft manuscript was completed by Roz and Greg for review on the morphological condition of larval herring during the same three seasons. A descriptive larval herring feeding paper is now in progress by Roz Cohen and several others. Plots of zooplankton abundance, based on samples from 0.333 and 0.165-mm mesh nets, are now being produced by the FISHMAP computer program with the help of Nancy Lyon.

Dave Potter completed a draft manuscript on the ICNAF neustonic ichthyoplankton data for the 1974-75 season, and began editing sample data tapes from West German R/V Anton Dohrn Cruise No. 77-03 to retrieve volume filtered for a study of the vertical distribution of larval herring.

Greg Lough spent considerable time this month in the necessary paper work to acquire a HIAC particle-size analyzer system for use in our larval fish - prey microdistribution studies. Also, our 0.25-m mini-MOCNESS (multiple opening-closing net and environmental sensing system) microzooplankton net (nine separate nets of 64-mm mesh) was delivered to us from Peter Wiebe and business associates. A 1-day meeting was held on 23 July with the principal investigators (Greg Lough, Geoff Laurence, Marv Grosslein, Jack Green, Red Wright, Ron Schlitz, and Hal Merry) to develop a sampling strategy for our larval fish - prey microdistribution studies

and plan for a joint upcoming test cruise during 3-14 November 1980 aboard the Albatross IV. Greg Lough was designated chief scientist for the cruise and he is preparing the sailing orders.

Hal Merry repaired four MARMAP (Marine Resources Monitoring, Assessment, and Prediction Program) meter blocks this month and installed a Loran C unit and plotter first aboard the WHOI vessel Bird of Passage for a shark-tagging experiment and second aboard the Albatross IV for a bottom trawl gear testing cruise. Hal also worked on MOCNESS data tapes to retrieve volume-filtered data from past hauls, and on the PET computer unit for installation of a modum. Hal and Greg met with EPSCO representatives about their new Chromascope Sounder available with various frequencies from 28 to 200 kHz. They have agreed to loan us a complete system for our November 1980 gear-testing cruise to help identify plankton concentrations. Hal is following up on details of the transducer placement.

Greg Lough, Hal Merry, and Bob Marak met with Dr. Peter Wiebe of WHOI on 31 July to discuss the possibility of the NEFC acquiring a MOD 10 micronekton sampling system.

Ira Palmer, a Co-op student, participated on his second MARMAP survey on Evrika Cruise No. 80-06 during 14-29 July, and will immediately leave thereafter to return to school. Bea Hess participated on a food habits cruise aboard the Evrika during 3-12 July.

Roz Cohen attended an EEO management meeting at the Woods Hole Laboratory on 1 July.

Ecosystem Dynamics Investigation

The primary focus in July has been on ICES papers describing the food web involving finfish in the Georges Bank ecosystem. Ted and Ann Durbin have prepared documents on factors affecting digestion rates and estimation of daily rations for Georges Bank fish; Wendell Hahm and Mike Pennington together with Rich Langton worked on variability in stomach contents and on prey selection utilizing predator/prey weight ratios; and Ed Cohen condensed the paper on the energy budget for Georges Bank. A list of these documents is appended.

Other work on modeling included cooperative studies with Ira Sohn (New York University's Institute for Economic Analysis). Ira together with Wendell Hahm, Mike Pennington, and Jim Kirkley (of the Resource Assessment Division) worked on development of a bioeconomic model for the Georges Bank area. The biological part of this input-output model consists primarily of the computer program GEORGE. Diagnostic runs were made with GEORGE this month to begin exploration of the biological model's characteristics. Concurrently, meetings were held with Geoff Evans and Tom Leschine (WHOI) on analytical approaches (eigen-value and flow analyses) to evaluate the biological and economic systems being modeled. Ira presented a seminar at WHOI describing input-output modeling techniques used in Leontief's world model. On 31 July, Marv Grosslein held a meeting at the Woods Hole Laboratory with Ira, Ted Durbin, and members of the NEFC modeling group to review current status and coordination of modeling efforts and future plans.

Mike Pennington reanalyzed the haddock fecundity data after elimination of some observations which may have been biased; the final runs are being reviewed by Wally Morse before completing the manuscript on haddock fecundity.

Marv Grosslein participated in the Center Board of Directors' review of the NMFS national and regional 5-yr strategic plan documents on 24 and 25 July at the Woods Hole Laboratory.

Ed Cohen returned from a training assignment at the University of Washington and resumed his work on modeling the Georges Bank ecosystem. Nancy Lyon, a summer student from Florida State University, worked on data auditing routines for the food habits data base and began work for Roz Cohen on zooplankton distribution and density plots from 0.333-mm mesh net samples collected during the ICNAF time series of surveys.

Benthic Dynamics Investigation

Two people joined the Benthic Dynamics Investigation this month on temporary appointments. John Hacunda, a recent Master of Science graduate from the University of Maine, will be working on digestion and prey-selection studies with winter flounder and juvenile white hake, while Bob Kaminski, a recent graduate from the University of Massachusetts, will be working on the benthic data base. Tom Morris also joined the Investigation at the end of July and will be working in the research aquarium at the Woods Hole Laboratory.

One paper by Ray Bowman was accepted for publication as a note in the Fishery Bulletin (US). Bowman also finished a laboratory report on feeding and catchability of some Northwest Atlantic fishes.

The Benthic Dynamics Investigation was involved in a 2-wk fish feeding chronology cruise on the Evrika. Ray Bowman served as the American chief scientist and Jackie Murray participated as a biological aid. A total of 3128 digestive tracts were collected and preserved for analysis with the emphasis on yellowtail, fourspot, and winter flounders. Ray Bowman and John Hacunda worked up the frozen samples to derive length-weight equations for the three flatfish mentioned above.

Rich Langton spent the first 2 wk of the month working with the Manned Undersea Research and Technology Program's dive team on benthic studies at Jeffreys Ledge in the Gulf of Maine. Rich also continued work on several ICES papers for the upcoming meetings.

ICES papers have generally been, and will continue to be, the main emphasis of the Investigation for the next several weeks. Langton and Bowman together with Ted and Ann Durbin (URI), Mike Pennington, Wendell Hahm, Barbara North, Brian Hayden, and Marv Grosslein will be preparing a series of five documents on different aspects of fish feeding studies for submission to ICES.

Jim Towns participated on a bottom trawl survey (Delaware II Cruise No. DE 80-[illegible]) and generally made preparations for the upcoming summer cruises.

Jackie Murray has been updating the fish food habit data base. She completed revising all individual fish data collected between 1969 and 1972, and is currently working out some minor problems in the 1973-76 data base.

Roger Theroux continued to work on the bivalve report; the final 120 distribution charts were delivered to the printer for photographing. Roger has worked closely with Bob Kaminski on the benthic data base update and other automatic data processing (ADP) housekeeping tasks. Roger also consulted with a number of people this month: (1) Nancy Masiolek and James Blake from the Clapp Labs and also Don Maurer from the University of Delaware regarding polychaete samples; (2) Peter Kinner from Normandeau Associates who requested information concerning the Gulf of Maine and Georges Bank; and (3) Arnold Howe from the Massachusetts Division of Marine Fisheries regarding benthic sampling strategy and gear for an improved survey in Cape Cod Bay.

Ichthyoplankton Investigation

The first part of our summer MARMAP I survey on Evrika ended as the month closed. After a brief stop at Woods Hole to exchange scientific personnel, the vessel departed to begin the final leg of the cruise. Myron Silverman replaced Mike Fahay as field party chief. Don McMillian, Patty Rosenberg, and John Antonellis are aboard to collect ichthyoplankton and neuston samples. They relieved Cindy Fahay, Julian Goulet, and Ira Palmer. The cruise is going well. Nearly 68% of the stations have been completed in half the allotted vessel time. Scombrids and hakes (Urophycis spp.) commonly occurred in the neuston samples. Butterfish, hakes (Urophycis spp.), and cunner larvae were the most abundant taxa in the plankton samples.

Larval length sheets were received from the Polish-American Plankton Sorting and Identification Center for our winter survey (Albatross IV Cruise No. AL 80-03). Sand lance (Ammodytes spp.) numerically dominated the ichthyoplankton, but abundance estimates fell far short of estimates for the past four winters. Again, the center of their distribution occurred between the New York Bight apex and Nantucket Shoals. They were sparsely distributed on Georges Bank, an area where dense concentrations of larvae have been encountered in the past.

Oceanic Gamefish Investigation

In July, information was received concerning 26 recaptures of tagged fish. These included 18 blue sharks, 2 makos, 3 blacktips, and one each for dusky, oceanic whitetip, and tiger sharks. Fifteen of these recaptures occurred at shark fishing tournaments in New Jersey and Long Island. Staff biologists attending these tournaments were able to examine these recaptured sharks and obtain biological measurements and samples for age and growth studies. The majority of the recaptures were short-term, reflecting the high fishing intensity off the Southern New England coast.

Three major shark tournaments were sampled in July. The Montauk Charterboatmen's Tournament on 12 and 13 July was attended by Jack Casey, Wes Pratt, Chuck Stillwell, and Larry Lindgren. A 480-lb mako, 472-lb dusky, and 242-lb thresher were the significant fish examined. A 622-lb female mako was held for us at a nearby marina and dissected at that time.

The Montauk Marine Basin Tournament was held on 19 and 20 July. Fifty-nine fish were landed, the largest of which was a 354-lb mako. Both of these tournaments emphasize tagging small fish. Several hundred sharks were tagged during these two tournaments.

Chuck Stillwell attended the Babylon Invitational Tournament held on 26 and 27 July. The tournament was concentrated on offshore fishing in the area of Hudson Canyon. A total of 67 fish were landed including 18 sharks, mostly makos and tiger, and 37 tunas including yellowfin (26), bluefin (7), and bigeye (4). The largest shark was a tiger that weighed in at 525 lb.

July has been a very active month with many sharks being tagged. As the tagging data arrives, they are being coded, verified, and prepared for computer-card keypunching. Mike Couturier traveled to the Woods Hole Laboratory to learn how to adapt the FISHMAP plotting program to our shark tag data. Several years of tag data have been plotted by Larry Lindgren and Mike Couturier and locations verified by referring to original data. This is the final phase in data verification.

Food habits data were collected at three tournaments held during July. The predominant prey found in the makos was bluefish followed by squid, sand lance, and Atlantic saury in the smaller (3.5-5.0 ft) sharks. Blue sharks, sandbars, tigers, and a scalloped hammerhead were either empty (50-60% of total) or contained small quantities of food comprised of squid, saury, butterfish, skate and skate egg cases (in a tiger), and shark remains. One tiger shark contained approximately 10 lb of marine mammal flesh and blubber along with cranial and vertebral remains. Bluefin, yellowfin, and bigeye tuna examined from an offshore tournament (Hudson Canyon) had fed almost exclusively on short-finned squid. Some evidence of minor predation on butterfish and Atlantic saury was observed in the yellowfin and bigeye.

Historical longline stations off Sandy Hook, New Jersey, and the Rockaways, New York, were sampled by Jack Casey, Wes Pratt, and Nancy Kohler from the F/V Donna Lee (the old R/V Challenger). The vessel was chartered by the Sea World Shark Institute for specimen collection and made available to us at no cost. As the cruise will extend into August, results will be reported next month.

Nancy Kohler completed a cooperative cruise with Dr. Frank Carey of WHOI on the R/V Bird of Passage. Five blue sharks were sonic tagged and tracked in the area of Deepwater Dumpsite (DWD) 106. Two were retrieved after 10 and 26 hr to determine the degree of digestion of the mackerel baits.

Jack Casey and Wes Pratt made three flights in spotter planes to locate, observe, and photograph basking and white sharks off Southern New England. Wes assisted David Doubilet, a photographer working for National Geographic magazine, taking in situ photographs of basking sharks.

Wes Pratt lectured on shark reproduction to the students and faculty of St. George's School summer oceanography program on 2 July.

Plankton Ecology Investigation

Bongo plankton sampling gear and an expendable bathythermograph (XBT) system were placed aboard the Sail Training Association's S/V Regina Maris for use on a cooperative MARMAP-Suffolk University cruise in the Gulf of Maine. Briefings by Robert Marak and Ken Sherman were given to Sal Testaverde of the NMFS Northeast Regional Office's Fisheries Management Operation Branch who was chief scientist on this cruise. Bottom trawl tows were also made along a transect from Boston, Massachusetts, to Cobscook Bay, Maine. Similar gear was also loaned to Dr. Tom English of the University of Washington for use in his cooperative study with Norway being carried out in the North Sea. Briefings on MARMAP standard techniques were also given.

A pre-bid conference for removal and covering of the asbestos on the ceilings of the Narragansett Laboratory was held on 24 July at the Narragansett Laboratory. Six contractors were present as well as Jerry McConnell of the Northeast Regional Office and Peggy Lamoureux, Alice DeNofa, Robert Marak, Reed Armstrong, and Tom Caldwell of the Narragansett Laboratory.

Robert Marak and Ken Sherman attended strategic planning meetings held at the Woods Hole Laboratory to assist in putting together a document for Terry Leitzell, the NOAA Assistant Administrator for Fisheries.

Field tests on the Acoustic Link Discrete Plankton Sampler were run in Narragansett Bay. Three of the five samplers were completely tuned and responded well. The remaining two will be tuned and tested in the near future.

Jerry Prezioso completed the shipment of samples from Delaware II Cruise No. DE 80-03 and Evrika Cruise No. 80-04 to Poland. Jerry is continuing to look at the euphausid data from 1978-79 MARMAP samples. Joe Kane is continuing the revision of

his wet volume - dry weight paper. The MOCNESS ichthyoplankton samples from Evrika Cruise No. 80-02 have been sorted. Jack Green attended to some details for the Narragansett Laboratory's solar energy project, edited a report on temperature conditions on Georges Bank with Donna Busch and Igor Sigaev, interviewed candidates for sorting invertebrate plankton from Evrika Cruise No. 80-02, and attended a meeting of the process-oriented research task force.

Donna Busch spent a week at the Sandy Hook Laboratory finishing the the analysis of eight 1979 MARMAP and Ocean Pulse Program cruises and revising several 1977 and 1978 cruises of ^{14}C-uptake data with Jay O'Reilly. She continues to coordinate exchange of ichthyoplankton, zooplankton, hydrographic, chlorophyll-a, and ^{14}C data with Soviet scientists, and has prepared sampling equipment and a protocol for phytoplankton samples on Evrika Cruise No. 80-06 which will be sent to Gdynia, Poland, for processing and analysis in Stefan Grimm's laboratory by Dr. Zofia Ringer. She also prepared a description of the Narragansett Laboratory and professional staff which will be included in an upcoming issue of the American Fisheries Society bulletin, Fisheries. And, with Jack Green, she worked on an American-Soviet article based on data collected with Igor Sigaev and Jack Green aboard Evrika Cruise No. 80-02. The article was prepared for submission to Coastal Oceanography and Climatology News.

Biostatistics

New 1980 MARMAP master data files were created for Albatross IV Cruises No.'s AL 80-02 and AL 80-03, Delaware II Cruise No. 80-02, and Polish R/V Wieczno Cruises No.'s 79-03 and 80-02. Cards for Evrika Cruise No. 80-01 were received from the Sandy Hook Laboratory and cruise data for Evrika Cruise No. 80-04 and Delaware II Cruise No. DE 80-03 are being keypunched. Ichthyoplankton data were merged into master files for Albatross IV Cruises No.'s AL 78-13 and AL 78-14, Wieczno Cruise No. 78-04, and Soviet R/V Belogorsk Cruise No. 79-01. Zooplankton data were added to master files for Albatross IV Cruises No.'s AL 79-06 and AL 79-11 and for Belogorsk Cruises No.'s 79-01 and 75-03. Zooplankton logs arriving from Poland included those for Wieczno Cruise No. 79-03 and Albatross IV Cruise No. AL 79-13, which are currently being keypunched. Wet-displacement volume data were merged into 1979 MARMAP master files. A package of 1978 and 1979 station data, ichthyoplankton data, and zooplankton data was prepared for Donna Busch for delivery to the Soviets.

Contours of abundance of three species of zooplankton for the 1979 MARMAP surveys were completed by Steve Eldridge and Lorrie Sullivan. Cindy Jones completed statistical analysis of the 1979 zooplankton data, and Tom Plichta analyzed the 1979 displacement volume data, all for the ICES paper being prepared by Ken Sherman.

Lorrie Sullivan and Julien Goulet completed a laboratory reference document for data flow protocol, and Lorrie completed an ICES contribution on larval butterfish. She also began work on a survey of the contents of the master files in the MARMAP data base. Julien Goulet participated in the MARMAP cruise on the Evrika this month.

Carolyn Griswold attended a meeting of the Subcommittee on Monitoring for the Georges Bank Biological Task Force (BTF) on the URI Bay Campus on 8 and 9 July. A research plan for determining the effects of oil and gas exploration and production on Georges Bank was reviewed and revised. The plan was presented to the BTF at a meeting on 14 and 15 July in Boston, Massachusetts. Members of the BTF accepted the plan which will now be forwarded to the US Geological Survey's North Atlantic Oil and Gas Supervisor with the recommendation that such a study be conducted at selected sites of exploratory drilling operations.

Fishery Oceanography Investigation

A computer graphics package which will vastly enhance the usefulness of our Tektronix terminal for current-meter data analysis was completed by Gil Dering with assistance from Ron Schlitz and Steve Ramp. The package includes a program which converts current-meter tape data to a format of daily blocks (96 records) in engineering units. The graphics program then reads the data and draws stick plots of current speed and direction, polar plots of velocity, plots of water speed versus time, east or north velocity component versus time, temperature versus time, and clock linearity. All of this is done rapidly and conveniently in-house.

The new Hewlett-Packard high-speed printer arrived and is being tested in conjunction with other terminal hardware. It appears to meet all our requirements.

Steve Ramp has been reviewing the theory of rotary spectral analysis with respect to wind and current records from the Northeast Channel, as part of the effort to find a physical explanation for the flow characteristics in the Channel and their seasonal variability. Art Allen has continued work on comparison of American and Canadian current-meter data from the 1978 larval Atlantic herring patch study.

Derek Sutton, Tom Laughton, and Bob Buckman have been renovating the marker floats, subsurface buoys, and other mooring hardware recovered from the Nantucket Shoals flux experiment, with the help of Danny Warren, a sandblaster from Buzzards Bay, Massachusetts.

Word was received via the US Navy that our missing subsurface float from the northernmost mooring in the 1978 larval Atlantic herring patch study on Georges Bank had been picked up by a Spanish trawler and is now in Spain. The Navy is making arrangements to return the buoy to the NEFC.

Work on MARAMP data continues. Vertical sections of temperature and salinity have been completed by Dan Patanjo, Bob Buckman, Jim King, and Bruce Davis for the first 2 yr of cruises. Dan and Bruce are finishing a report on comparison of XBT and bottle data and Ron Kirschner has written a manual for MARMAP hydrographers. Dan is also updating the cruise summary file. Tom Laughton has completed corrections in his volumetric temperature-salinity census for the Gulf of Maine.

Anne Dorkins is completing her report for ICES on geostrophic transports associated with the Nantucket Shoals flux experiment, while Steve Ramp and Red Wright are preparing a paper on Northeast Channel influx and the Georges Bank nutrient budget. Red has also put together the US contribution to the ICES summary of regularly produced environmental data products, and has sent to Canada's Marine Environmental Data Service all the US data from the ICNAF larval Atlantic herring survey series not previously submitted. Ron Schlitz has provided information on the temperature structure on Georges Bank and vicinity to the Canadian Consulate in Boston, Massachusetts.

Sam Nickerson has plotted bottom salinity for all MARMAP cruises, added the spring bottom trawl survey to his series of plots of surface salinity and surface and bottom temperature, and obtained calibration certificates for our new deepsea reversing thermometers from Geoff Whitney at WHOI.

Red and Ron have been developing plans for NEFC input to the multidiscipline, multiinstitution warm-core ring investigation recently funded by the National Science Foundation for 1981-83. They also participated in a planning meeting with Geoff Laurence and Greg Lough for a joint gear-testing cruise in November.

Red gave two talks during the month, one concerning the Gulf Stream and Sargasso Sea at Bermuda Biological Station and another concerning the slope water region to Sea Education Association students about to set out for Newfoundland on the R/V Westward.

Ron Kirschner resigned in July to attend chiropractic college. His position has not been filled.

Meetings, Talks, Visitors, and Publicity

Recently the Narragansett Laboratory staff viewed the film, "Desert of Ice and Sea of Life" about the antarctic ecosystem.

On 1 July, Ken Sherman met with Drs. Ted and Ann Durbin, Dr. Saul Saila, and Dr. Howard Winn from URI.

On 9 July, Ken Sherman delivered three drafts of BIOMASS handbooks to the Massachusetts Institute of Technology for printing.

The Narragansett Laboratory was visited on 9 July by Ed Chin and Dave Harrington from the University of Georgia.

On 10 July, the Narragansett Laboratory's permanent employees who were not on vacation were photographed for inclusion in an article for the American Fisheries Society bulletin, Fisheries.

Ken Sherman traveled to Boston on 14 July for a special viewing of the film, "Georges Bank: Prime Interest" at TV Station WSBK, Channel 38.

On 21 July, Ken Sherman was at the Woods Hole Laboratory to attend a strategic planning meeting.

From 23 to 25 July, Ken Sherman attended the Center Board of Directors meeting at the Woods Hole Laboratory.

On 29 and 30 July, Dr. Edwards and Helen Mustafa were at the Narragansett Laboratory and URI to attend a Steering Committee meeting of the proposed Northeast Regional Remote Sensing System.

Publications

Bowman, R. Food of ten Northwest Atlantic juvenile groundfish. Fish. Bull. (US). (A)

Naplin, N. A.; Obenchain, C. L. A description of eggs and larvae of the snake eel, Pisodonophis cruentifer (Ophichthidae). Bull. Mar. Sci. 30(2): 413-423;1980. (P)

Wilk, S. J.; Smith, W. G.; Ralph, D. E.; Sibunka, J. Population structure of summer flounder between New York and Florida based on linear discriminant analysis. Trans. Amer. Fish. Soc. 109(3):265-271;1980. (P)

Reports

Berrien, P. Yellowtail flounder, Limanda ferruginea, egg production and spawning population estimates for 1977 in the Gulf of Maine, Georges Bank, and Middle Atlantic Bight. Int. Counc. Explor. Sea, Comm. Mem.;1980.

Bowman, R. Diurnal periodicity in the feeding and catchability of some marine fish and squid. Woods Hole Lab. Ref. Doc. No. 80-17;1980.

Cohen, E. B.; Grosslein, M.; Sissenwine, M.; Steimle, F. An energy budget for Georges Bank. Int. Counc. Explor. Sea, Comm. Mem.;1980.

Cohen, R. E.; Lough, R. G. Comparison of reported length-weight relationship for the dominant copepod prey of larval sea herring in the Georges Bank-Gulf of Maine area. Woods Hole Lab. Ref. Doc. No. 80-19;1980.

Durbin, E.; Durbin, A.; Langton, R.; Bowman, R.; Grosslein, M. Analysis of stomach contents of Atlantic cod (Gadus morhua) and silver hake (Merluccius bilinearis) for the estimation of daily rations. Int. Counc. Explor. Sea, Comm. Mem.;1980.

Fahay, M. P. A guide to the early stages of marine fishes occurring in the western Atlantic with emphasis on species found north of Cape Hatteras. Int. Counc. Explor. Sea,Comm. Mem.;1980 (Abstract).

Hahm, W.; Langton, R. Prey selection based on predator/weight ratios for some Northwest Atlantic fish. Int. Counc. Explor. Sea,Comm. Mem.;1980.

Langton, R.; North, B.; Hayden, B.; Bowman, R. Fish food habit studies--sampling procedures and data processing methods utilized by the Northeast Fisheries Center. Int. Counc. Explor. Sea,Comm. Mem.;1980.

Lough, G.; Pennington, M.; Bolz, G.; Rosenberg, A. A growth model for larval sea herring (Clupea harengus L.) in the Georges Bank - Gulf of Maine area based on otolith growth increments. Int. Counc. Explor. Sea,Comm. Mem.; 1980.

Pennington, M.; Bowman, R.; Langton, R. Magnitude of the variability of the weight of fish stomach contents and its implications for fish food habit studies. Int. Counc. Explor. Sea,Comm. Mem.;1980.

Sherman, K.; Jones, C. The zooplankton component of a Northwest Atlantic ecosystem. Int. Counc. Explor. Sea,Comm. Mem.;1980.

Smith, W.; McMillian, D.; Rosenberg, P.; Silverman, M.; Wells, A. Seasonal and annual changes in the distribution, abundance and species composition of fish eggs and larvae off the northeastern United States, 1977-79. Int. Counc. Explor. Sea,Comm. Mem.;1980.

Sullivan, L. Distribution, abundance, and mortality estimates of larval butterfish, Peprilus triacanthus, from MARMAP surveys, 1977 and 1978. Int. Counc. Explor. Sea,Comm. Mem.;1980.

Sullivan, L. F.; Goulet, J. R., Jr. Protocol for data flow through the MIS (MARMAP Information System): ichthyoplankton, zooplankton, and related sampling data. Narragansett Lab. Ref. Doc. No. 80-53;1980.

RESOURCE UTILIZATION DIVISION

Fisheries Engineering Investigation

Guards for the prototype squid ring cutter have been constructed and installed, and testing of the machine has begun.

The Dutch beam trawl net was received. Materials for construction of the beam have been ordered and the chain has been bought.

The videotape results from the 1979 sea scallop gear research were presented to New Bedford fishermen by Vern Nulk.

A modified version of the new juvenile fish sampler is being built and will be tested for catching American sand lance.

Tom Connors and Pesi Amaria conducted a time and motion study with the cooperation of the management of a Gloucester fish processing plant to determine if productivity can be increased. A plan has been developed for altering the fish processing line at the processing plant. This will make better use of space and personnel, and it will raise the overall efficiency of fish processing, including a reduction in energy requirement. The results of the government/industry pilot project will be distributed to other fish processors.

Engineering Assistance to Other NEFC Programs

Another trip on the M/V Marine Evangeline was completed by John Kenney in support of the Atlantic Environmental Group's periodic transect monitoring studies. We are assisting the Woods Hole Laboratory in preparing for the August surf clam - ocean quahog survey cruise and in specifying replacement parts for the reel winder.

R/V Rorqual and R/V Gloria Michelle

The Rorqual was used for 9 days this month as a platform for diving operations on Jeffreys Ledge as part of the Ocean Pulse Program.

Considerable time has been spent preparing for the trip to Mississippi to bring the R/V Gloria Michelle back to the Gloucester Laboratory. Plans are to have it in Gloucester by the end of August.

Facilities

Installation of the new steam boiler at the Gloucester Laboratory has been completed. It has been inspected and is now being used.

Mike Allsup and Dan Baker spent most of this month inspecting NEFC laboratories and vessels for compliance with US Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) regulations. Mike has been made Center Coordinator of EPA requirements while Dan Baker is in charge of the OSHA rules. Mike has been setting up disposal firms to handle various chemical and hazardous wastes generated from the laboratories. Also, permit application notification has been initiated for those laboratories that handle, generate, and store hazardous materials.

A meeting was held at Woods Hole with Herb Stern, Mary Laird, Don Wood, Bob Cannon (Regional Safety Officer), Dan Baker, Mike Allsup, and two OSHA representatives. This meeting helped define Center/Regional safety programs necessary for compliance to OSHA.

Resource Development and Improvement Investigation

University Contacts

Dr. Hseih of the Massachusetts Institute of Technology, and Dr. Robert Ackman of Nova Scotia Technical College were consulted about cholesterol methodology.

Nutrition

A study of the fatty acids and sterols in blue mussels has been started. Blue mussels have been shucked and will be frozen for 1 yr. Samples will be thawed monthly to detect changes in fatty acids and in sterol levels.

Species Identification

The manuscript for the collaborative study to gain official recognition of our method for species identification is in progress for an 30 August deadline. The method of isoelectric focusing was used in an attempt to identify the species in a seafood for the State of Maine.

Kate Wiggin is continuing to develop an agarose gel method of identification.

Data Processing

Kay Paine from the Woods Hole Laboratory paid a visit to the Gloucester Laboratory to help us more effectively use the 1022 ADP system.

New Product Development

Of Atlantic cod fillets stored at +5°, 0°, -5°, and -20°F for 10 mo, the sample stored at +5°F is only borderline, while the other three samples are fair to good. Initial results from the Hunter L Colorimeter measurements of the samples show that the color changed only slightly. The texture of the raw samples as measured by the Instron Texturometer showed very little change. The cooked samples showed that the texture of the +5° and 0°F samples appear to be getting tougher.

An exploratory experiment to determine the storage life at 34°F of bulk-packed Atlantic cod fillets in nonpermeable CO_2-flushed pouches was completed. Test results showed that the CO_2-packed fish were highly acceptable up until the 11th day of storage and borderline on the 14th day. The air-packed control was borderline on the 11th storage day. The pH values changed very little over the storage period. A large amount of drip in the CO_2 samples as compared to the air-packed control was noted. Nitrogen determinations showed that the drip in the CO_2-flushed samples contained 8-10 mg/ml total protein.

The experiment to determine the storage life of Atlantic cod fillets dipped for 30 sec in 5% potassium sorbate was completed. The fillets were graded as borderline on the 16th day of storage at 34°F. The pH of the sample did not change much.

Along with other members of the Gloucester Laboratory, Joe Mendelsohn gave a talk at a meeting attended by members of the US Army's North American Research and Development Command (NARADCOM) involved in classification of fish species by their edibility characteristics. Joe spoke on the "U.S. Grade A" fresh fish program. Interest in the subject kept a 10-min scheduled talk going for about 1 hr.

Textural Quality

Joe Mendelsohn and Joe Licciardello reviewed a manuscript on the effects of modified atmospheres and potassium sorbate ice on red hake and salmon. The paper was prepared by M. Fey and J. Regenstein of the Cornell University Department of Poultry and Avian Science.

Texture of Boiled Squid

We are presently investigating the relationship between the amount of thermal energy absorbed by squid meat and its texture as measured by both the Instron Texturometer and an experienced taste panel. When mantles from Illex spp. squid were immersed in boiling water for periods of 1, 2, 4, 8, 16, and 32 min, the optimum texture was found to occur when the heating period was between 16 and 32 min. There was excellent correlation between the Instron and the trained taste panel.

Product Quality, Safety, and Standards Investigation

Product Quality

In the seafood industry, quality loss in iced dogfish is demonstrated by the accumulation of ammonia and it was hoped that the Orion ammonia-detecting electrode would qualify as a simple and rapid technique. However, due to interference by trimethylamine, modifications of this procedure are necessary. It might be possible to use a two-electrode system with one more selective for ammonia and the other more selective for trimethylamine. Each of these substances interfere with the measurement of the other however, and the extent of interference must be determined. Along with electrode measurements, the ammonia content of the flesh is being measured by the chemical method of Seligson and the trimethylamine content is being measured by gas chromatography. Taste tests are also being conducted on these samples to determine when panelists detect the presence of ammonia.

Ron Lundstrom met with Mr. Louis Gershman, Director of the Food and Drug Administration's (FDA) Boston Laboratory and a General Referee of the Association of Official Analytical Chemists (AOAC), to discuss the status of the isolectric focusing fish identification methods. Our recommendations to the AOAC this year include:

(1.) Polyacrylamide-gel isoelectric focusing should be accepted as an "Official Final Action Method" for species identification with no species limitation this year.

(2.) A rapid isoelectric focusing method using agarose gels will be subjected to a collaborative study this fall/winter.

Ron Lundstrom and Fred Correia met with Dr. Herb Hultin and staff (of the University of Massachusetts) to discuss our progress on the red hake texture project. An interesting finding was that red hake fillets or mince, packaged in plastic tubs (air present) and stored in ice for up to 2 wk, produced only traces of dimethylamine and formaldehyde. Red hake fillets or mince packaged in evacuated polyethylene bags (oxygen permeable) and stored in ice for up to 2 wk, however, produced large quantities of dimethylamine and formaldehyde. Minced red hake produced more dimethylamine and formaldehyde than red hake fillets, indicating that cellular disruption rather than freezing per se is important in the reaction. The presence of oxygen inhibits the reaction.

University Relations

The Division supplied information on methods for the gas-liquid chromatographic analysis of volatile amines in fish to Alan Samson of Cornell University in Ithaca, New York.

Facilities and assistance were provided to Barbara Rasco of the University of Massachusetts Marine Station in Gloucester, Massachusetts. Preparative isoelectric focusing in sephadex G-75 was used to purify lipase from dogfish, then analytical isoelectric focusing in agarose gel was used to assess the purity of the lipase preparations.

Product Safety

All fish muscle samples received from Texas A&M University have been composited, worked up, and analyzed for polychlorinated biphenyl content. Another shipment of samples from Texas A&M University is expected next week.

Muscle and gonad samples of striped bass continue to be composited, homogenized and worked up as well.

Product Standardization

As a result of informal comments received, an initial draft of an expanded "U.S. Standards for Grades of Frozen Fried Fish Portions" was prepared.

An initial draft of a "U.S. Standards for Grades of Fish Steaks" is being circulated for informal comments.

We are continuing to assist in the selection of species for the nomenclature project by NARADCOM. This month the study was expanded to include various species which are sold as "snapper."

Products from red crab, ocean quahogs, squid, blue mussels, and goosefish were presented to over 40 members of the Armed Forces Product Evaluation Committee and their consultants. All products were rated highly, and we can expect increasing acceptance by the military of nontraditional species of fish as a result of this visit.

The US Department of Agriculture (USDA) has accepted the commercial item description (CID) for canned tuna as an interim purchase document. Before issuance as an interim document, certain legal impediments concerning the "Buy America Act" had to be resolved. The document is now being used by the USDA for procuring canned tuna for use in school and other USDA feeding programs.

Now that the CID's for canned tuna and salmon have been accepted as interim USDA documents, we have started the process of fully coordinating the documents with the tuna and salmon industries and with all government agencies concerned with buying foodstuffs.

University Contacts

Dr. Tyre C. Lanin of North Carolina State University was involved in several phone conversations with our staff regarding planning a conference on minced fish technology.

Technical Assistance

During July, technical advice and/or assistance was given to: Frank Miller of the Stephen Paoli Company in Rockford, Illinois, regarding current status of minced fish technology in the US and future commercial prospects; Dr. Elhag of General Foods, Inc., in Tarrytown, New York, regarding "U.S. Standards for Grades of Fishery Products;" Mr. Floyd Manning of the Maine Department of Marine Resources in Augusta, Maine, regarding Norwegian quality standards for fish; Mr. George McNeil of Beverly, Massachusetts, regarding information on fish silage; Mr. Walter Sullivan of the

Clear Springs Trout Farm regarding acceptance of rainbow trout fillets by the Armed Forces Product Evaluation Committee; Glenn Kiel of NMFS Western Inspection Office regarding time-temperature tolerance of rockfish; Tom Dedinney of Acme Market in Philadelphia, Pennsylvania, regarding information on fish parasites; US Senator Robert T. Stafford of Vermont regarding information on the smoking of salmon; Mr. Haggelund of the National Food Processors Association in Seattle, Washington, regarding ocean quahogs; Mr. Clayton Douglass of Fishery Products in Danvers, Massachusetts, and Dr. Dean Bottrill of Australia regarding storage life of fish in modified atmospheres; Mr. Bill Carroll of the CEDA Corporation in Annapolis, Maryland, regarding processing water and wastes in a typical fish processing plant; Mr. Mike Foley of the M. F. Foley Fish Company in Boston, Massachusetts, regarding storage of fish in modified atmospheres and proper packages, as well as effect of storage variables on quality; Ms. Arlene Joyce of the NMFS Northeast Regional Office's Marketing Branch in Baltimore, Maryland, regarding processing of gurry and canning squid; Captain Ciaramitaro of Captain Joe and Sons, Inc., in Gloucester, Massachusetts, regarding salting of fish; Mr. George Harnick of Old Greenwich, Connecticut, regarding smoking fish; Mr. Tony Kloss of Oceanside Fisheries in Magnolia, Massachusetts, regarding salting of fish; Mr. Phillip Legare of Tiverton, Rhode Island, regarding preparing different salted fish products; Messrs. Terry and Juhl, President and General Manager, respectively, of Lyon Foods in Golden Valley, Minnesota, regarding commercial production of marinated squid; Ms. Sybil D. Kaplan, a Cooperative Extension Specialist at URI, regarding cholesterol content of squid; Carrier International Corporation regarding chilled seawater systems for bulk holding sea herring; Winninghoff Boats, Inc., of Rowley, Massachusetts, regarding holding herring; Scott Norris of New York State regarding squid and chilled seawater; Duncan Amos of URI regarding an ICES report; Walter Kalil of Newburyport, Massachusetts, regarding inshore bait fishing; Billie Lee of Rockport, Massachusetts, regarding scallop drags; and Morry Edwards of Rockport, Massachusetts, regarding fishing vessels.

Meetings, Talks, Visitors, and Publicity

Meetings

Dr. Herbert Hultin of the University of Massachusetts Marine Station in Gloucester, Massachusetts, plus two professors on sabbatical leave at the Station (Dr. Bohdan Slabyj of the University of Maine at Orono, and Dr. David Stanley of the University of Guelph in Guelph, Ontario) and Dr. Arthur Rand of URI, participated with five Gloucester Laboratory staff in a seminar on "Freshness of Fish" on 14 July at NARADCOM's Natick, Massachusetts, laboratory.

Ron Idol from Cryovac visited Louis Ronsivalli to discuss the health hazards ramifications of containerizing seafoods for holding at refrigeration temperatures above freezing in gas-impermeable flexible pouches.

Louis Ronsivalli met with Tom Billy and Jim Brooker of the NMFS Seafood Quality and Inspection Division in Washington to discuss the potential of a quality assurance study with frozen seafoods now that our previous work with unfrozen seafoods has created such nationwide and even international impacts.

Louis Ronsivalli met with Howard Nickerson of the New England Fisheries Steering Committee and members of his staff, Tom Billy and members of his staff, John Linehan of the NMFS Northeast Regional Office, and representatives of the New Bedford seafood industry to discuss a comprehensive quality assurance demonstration project for domestic seafood producers.

Louis Ronsivalli met with the staffs of the Maine Department of Natural Resources and the Maine Development Foundation and members of the Maine seafood industry to assist in the establishment of a quality assurance project for the State of Maine.

Visitors

Dr. George Schwartzman, Assistant Executive Director of the AOAC, presented a seminar on the AOAC's activities at the Gloucester Laboratory.

John T. Everett of J. W. Everett, Ltd., visited us on 9 July. He is the owner of a wet fish processing plant in Aberdeen, Scotland. During a visit to the Boston Fish Pier, we learned about similarities and differences between UK and US fish purchasing, handling, and sales, as well as making fish blocks and fish portions.

Dr. Herb Brody, Director of the US Customs Service's Boston Laboratory, and Mr. Louis Gershman, Director of the FDA's Boston Laboratory, attended Dr. Schwartzman's seminar and later met with Ron Lundstrom to discuss isoelectric focusing species identification methods and future identification method plans.

Mike Cambell of the NOVA Company visited to display a small smoking kiln.

DIVISION OF ENVIRONMENTAL ASSESSMENT

Behavior of Marine Fishes and Invertebrates Investigation

The experimental system for studies on the effects of low dissolved oxygen (DO) has been completed. Tests of the degassing system have shown it to be capable of lowering the DO level in the 1500-liter aquarium to 1.75 mg/ℓ. Modifications of the degassing system suggested by personnel at the EPA's Duluth Laboratory for obtaining DO levels below 1 mg/ℓ are presently underway. Upon completion, studies will begin to examine the effects of low DO on juvenile bluefish and red hake. Fish for these studies have been collected and are currently being maintained at the Sandy Hook Laboratory.

In addition, the field experiment on the effects of petroleum-contaminated sediment on the feeding behavior of the blue crab on littleneck clams, a cooperative effort between the Battelle Laboratory at Sequim, Washington, and this Investigation at the Sandy Hook Laboratory, jointly supported by EPA funding and the Ocean Pulse Program, is underway. Sixteen caged boxes, each containing one blue crab and natural densities of littleneck clams of sizes normally within the blue crab's diet, are currently being placed on the bottom of Sandy Hook Bay by biologists using SCUBA. Eight of the cages contain petroleum-contaminated sediment, while the other eight contain uncontaminated sediment serving as controls. Observations of feeding rates are being made daily. In addition, four cages, again half-contaminated and half-uncontaminated, containing only clams are being placed in the Bay to examine the effect of petroleum on their vertical distribution within the sediment. This additional aspect of the field experiment was prompted by the results of an earlier cooperative study on the Dungeness crab and littleneck clam which showed that while the clams survived the exposure to the contaminated sediment, their vertical distribution within the sediment was significantly altered. The alteration apparently affected their susceptibility to predation by crabs. The results from both parts of this experiment should enable us to determine not only the effect of petroleum on the predator and the prey, but also on the more complex predator-prey relationship as well.

Biological Oceanography of Stressed Ecosystems Investigation

Samples from Evrika Cruise No. 80-05 have just been received. Samples for phytoplankton community structure are currently being obtained aboard Evrika Cruise No. 80-06. Ninety-seven vials with samples from Albatross IV Cruise No. AL 80-07 were processed. The data from Belogorsk Cruise No. 78-03 have been edited by Myra Cohn and Harold Marshall and resubmitted to the Sandy Hook Laboratory ADP Unit for processing. An introduction, methods, and bibliography have been written by Myra Cohn and the completed Belogorsk Cruise No. 78-03 data should be ready for submission as a NOAA Technical Report this fall. Data from Belogorsk Cruise No. 78-04 have been submitted by Myra Cohn to ADP for computer-card keypunching. Raw data were given to Dr. Jack Pearce for submission to the Soviets in August. No Olisthodiscus luteus bloom, usually evident in the Sandy Hook area around the time of the summer solstice, has materialized this year. No significant blooms of any species have been noted this summer. Nannochloris atomus has been the dominant organism, but not in bloom concentrations. Relatively little phytoplankton bloom activity has been noted south of Sandy Hook in New Jersey waters.

Algal bioassay of a group of 12 samples was begun. A complete set of assay samples was collected in the July NEMP cruise. Various facets of the assay technique are being examined to speed up the work. Automatic precision pipettes were ordered to facilitate making nutrient additions to seawater aliquots. An automatic dilutor was ordered to eliminate manual dilution during culture counting. The possibility was explored of purchasing a new electronic counter to avoid reliance on the present 17-yr-old unit.

Bill Phoel, Steve Spina, and Bob Reid conducted diving investigations around Swinburne and Hoffman Islands in Lower New York Bay near the Verrazano Bridge in response to a report of a "white fungus" covering and killing mussel beds. Small isolated patches of the "fungus" were located, photographed, and sampled. Ambient DO levels were 3.0 mℓ/ℓ. The "fungus" was tentatively identified to be a blue-green algae.

Bill also provided technical advice and assistance to Mr. Robin Zimmer of the New Jersey Marine Sciences Consortium in planting bags of mussels at the dredge spoil dumpsite for studies into the bioaccumulation of toxic substances.

Craig Robertson continued to process samples and computerize data from the second Chesapeake/Delaware Bay and Plume Studies (Superflux II). All data collected during concurrent remote sensing overflights have been processed and sent to Dr. Wayne Esaias at the National Aeronautics and Space Administration's (NASA) Langley Research Center.

Dr. James Thomas met with Dr. Wayne Esaias at the Langley Research Center to work on a joint NOAA/NASA document concerning the potential uses of remote sensing in the Chesapeake Bay area. Dr. Robert Edwards and Ms. Helen Mustafa along with Drs. Brian Pritchard and Janet Campbell later joined the meeting to discuss a joint Nantucket Shoals study and a joint symposium to be held late this year concerning the Chesapeake/Delaware Bay and Plume Studies (Superflux). Drs. Campbell and Thomas are to organize the symposium.

Coastal Ecosystems Investigation

Benthic Communities

Dave Radosh spent most of the month aboard Albatross IV collecting benthic samples on the summer NEMP cruise. Bob Reid prepared for a more intensive benthic

sampling of the New York Bight which began 28 July on the NOAA R/V Kelez. Dave Radosh, Florrie Wood, Jennifer Kennedy, and Marie Cheung from our group are also participating on this cruise which will sample for benthic microflora, meiofauna, macrofauna, sediment grain sizes, and contaminant contents (heavy metals, polychlorinated biphenyls, polynuclear aromatics, and coprostanol, a sterol indicative of sewage disposal) at 44 stations in the Bight. We will also attempt to collect American lobsters, sea scallops, Cancer spp. crabs, and winter, summer, and windowpane flounder for analyses of body burdens of eight heavy metals, polychlorinated biphenyls, and polynuclear aromatics.

Ann Frame spent considerable time collecting and identifying polychaetes for the US Army Corps of Engineers which is trying to map polychlorinated biphenyl distributions in the worms in relation to the dredge spoil disposal area 6 nautical miles off Sandy Hook. Clyde MacKenzie and Bob Reid dove off Rockaway, Long Island, to deploy cages of sediment in a study of factors limiting setting success of surf clam spat.

Benthic Energetics

Most of this month's efforts were spent on cruises or cruise-related activities and on starting a new study examining the influence that ocean dumping has on benthic biomass. We were involved in two cruises this month. Frank Steimle completed planning and organizing the summer Ocean Pulse monitoring cruise and was chief scientist on the first leg (8-15 July) aboard the Albatross IV. During this cruise several cooperative studies were accomplished as part of NEMP. Russ Terranova participated in a NOAA R/V Mt. Mitchell cruise to DWD 106 where he assisted the chief scientist in hydrographic collections and collected benthic samples as a baseline to study future impacts of fly ash dumping at the site. Frank is working on plans for the remaining three Ocean Pulse cruises this year.

Jan Ward and Dot Jeffries began a study of the influence of ocean dumping on the biomass of benthic fauna in the New York Bight apex and continued developing an inventory of life history information on dominant Middle Atlantic Bight benthic invertebrates. Russ completed an analysis of the caloric content of samples of shark livers for Chuck Stillwell of the Oceanic Gamefish Investigation. Because of the difficulty in controlling moisture content of the samples, the results showed wider variation than expected.

Frank worked with Jay O'Reilly to make final corrections and format modifications to the hydrographic data set from Ocean Pulse cruises from April 1978 until last spring. He also worked on other manuscripts and replies to several information requests.

Environmental Chemistry Investigation

During this period, members of the Environmental Chemistry Investigation participated in Ocean Pulse, MARMAP, and NEMP surveys. Approximately 1200 seawater samples for nutrient analyses were collected by Al Matte during the Ocean Pulse survey (Albatross IV Cruise No. AL 80-07) of coastal/shelf water between Cape Hatteras and the Gulf of Maine. During the MARMAP survey (Delaware II Cruise No. DE 80-03/Evrika Cruise No. 80-04), approximately 1500 seawater nutrient samples were collected by Sandy Riley and Wendy Stephensen. Ralph Bruno was responsible for measurements of total daily primary productivity at 45 stations sampled during Evrika Cruise No. 80-06 and Mike Hurd measured production at 24 stations sampled during the Ocean Pulse survey.

Jim Duggan measured water column concentrations of netplankton and nannoplankton chlorophyll-a at 56 stations during the Ocean Pulse survey. Technicians Steve Fromm and Annette Pratt measured chlorophyll-a concentrations during Evrika Cruise No. 80-06.

Vincent Zdanowicz and Wendy Stephensen collected approximately 500 samples (sediment, fish, and invertebrate tissue) during the Ocean Pulse survey. Preparations were made for sampling metals and hydrocarbons in fish tissue and sediment samples during the NEMP survey of the New York Bight Apex aboard the Kelez.

We provided training, equipment, and standardized methods for the measurement of chlorophyll-a to Dr. Donald Lear, chief scientist aboard the US Coast Guard Cutter Evergreen. The Evergreen is conducting a NEMP survey of New York, Philadelphia, and the "106"dumpsites. The area off the coast of New Jersey which was anoxic in 1976 will also be sampled.

Al Matte and Ruth Waldhauer completed about 450 Autotechnicon analyses of phosphate, nitrate, nitrite, and silicate concentrations in seawater and about 466 ammonium analyses using manual spectrophotometric methods. We received the necessary materials and equipment to fully automate ammonium analyses using the Technicon Autoanalyzer.

Andy Draxler continued tests on the oxidation efficiency of our continuous ultraviolet (UV) digestion system for automated (Technicon) measurement of dissolved organic nitrogen and phosphorus in seawater. Following several modifications of the photoreactor, we achieved 99% efficiency in mineralizing urea to nitrate/nitrite. Urea is among the most difficult organic nitrogenous compounds to degrade. However, heat buildup in the UV system continues to be a problem.

Jay O'Reilly and Steve Esser (New Jersey Marine Sciences Consortium) continued monitoring of Ceratium tripos abundance in samples collected in the New York Bight during Delaware II Cruise No. DE 80-03 and Evrika Cruise No. 80-04. We began the computer coding of C. tripos abundance data generated during MARMAP surveys conducted in late winter 1979 and early spring 1980 (Albatross IV Cruises No.'s AL 79-13 and AL 80-02, Delaware II Cruise No. DE 80-03, and Evrika Cruises No's. 80-01 and 80-04).

During June and July, two NOAA trainees, Sharolyn Reid and Irish Green, assisted the Environmental Chemistry Investigation in the computerization, reduction, and contouring of nutrient data and chlorophyll data collected during Ocean Pulse and MARMAP surveys. They also perfomed salinity analyses and used our Wang computer terminal to edit nutrient data.

Part of July was spent compiling and proofing data collected during several cooperative US-USSR MARMAP surveys. Ruth Waldhauer and Al Matte prepared a data report summarizing ammonium nutrient measurements made during Delaware II Cruise No. DE 80-03, Belogorsk Cruises No.'s 79-01, 79-03, and 79-05, and Evrika Cruises No.'s 80-02 and 80-04. Chris Evans and Jay O'Reilly prepared a data report containing chlorophyll measurements made during the above surveys. Jay O'Reilly and Donna Busch prepared a compilation of primary productivity measurements made during the three Belogorsk cruises mentioned above. These data reports will be provided to Soviet scientists on the Evrika.

A first draft of a detailed manual describing standard chlorophyll-a methods used during NEFC's Ocean Pulse and MARMAP surveys ("A Manual for the Measurement of Total Daily Primary Productivity on MARMAP and Ocean Pulse Cruises using ^{14}C and Simulated in situ Sunlight Incubation") was developed by Chris Evans and Jay O'Reilly. This Ocean Pulse Technical Manual No. 1 may be used to standardize measurements of phytoplankton production made during the Antarctic First International Biomass Experiment.

Physiological Effects of Pollutant Stress Investigation

Physioecology

Work with F_1, F_2, and F_3 generations of the limpet Crepidula continued this month. Reproductive releases by Crepidula have slowed to four or five per day. In looking at some of the data collected, it is interesting to note that the initial size of Crepidula larvae at their time of release has increased since the study was first initiated 26 mo ago.

Three spawnings of American oysters for mercury toxicity studies were attempted this reporting period with no success. The oysters had sufficient gonadal material but refused to spawn.

Our study to determine egg viability and the effect of subsequent copper exposure to embryos of American oysters collected from clean water (in Long Island Sound off Greenport, New York) and polluted water (Housatonic and Quinnipiac Rivers in Connecticut) was resumed with a new group of oysters collected in June. Three separate bioassays were performed this month and the data are being analyzed now.

A range-finding 48-hr bioassay to determine the effect of polychlorinated biphenyl (PCB) Aroclor 1254 on oyster embryos was conducted this month.

Two hundred fifty 15-mo-old blue mussels exposed for 1 yr to copper and silver (1, 5, and 10 ppb) were removed from test tanks for metal uptake studies.

PCB analyses were completed on gill tissues from 50 rock crabs (10 samples) collected from the New York Bight as part of a study with Tom Sawyer of the Oxford Laboratory. The majority of samples had non-detectable quantities of PCB's, with a few samples having levels of about 0.2-0.4 ppm (wet-weight basis).

The question of organic molecules binding metals in seawater and rendering them less toxic than the "free" metal has been of concern in our studies. Research into possible ways to measure the relative amount of binding of copper was initiated this month. Preliminary findings are encouraging and could possibly lead to the use of Sephadex to separate the bound copper from the unbound copper and, thus, give us a measure of the free copper ion in seawater.

Physiological Effects

Several new gill-fixation protocols were developed this month for scanning electron microscopic examination of tissues from finfishes and crustaceans. These new preparations were developed after an extensive literature search over the last 2 mo.

Measurements are continuing on feeding and respiratory studies of bay scallops at different water-flow conditions. Thus far it appears that they are very sensitive to high flow rates and do not readily adjust to them. Temperature, of course, does play an important role in these two metabolic activities and the range between 15° and 20°C appears to be optimal, although much more experimentation needs to be done.

The "Long Island Sound Pulse" study continued. Windowpane flounder were collected at three stations in early July to obtain blood samples. We measured hematocrit and hemoglobin immediately and froze plasma samples for later measurements of osmolality, sodium, potassium, calcium, and magnesium. Magnesium analyses of the backlog of samples from 1979 continued.

A considerable portion of this reporting period was spent preparing for and participating in both legs of the July Ocean Pulse cruise on the Albatross IV. We have begun processing the samples brought back from that cruise as well as analyzing some of the data collected and recorded at sea. Work also continued on the measurements of serum osmolalities and serum ions in the backlog of samples from previous Ocean Pulse cruises.

Biochemical Effects

During the Ocean Pulse summer survey (Albatross IV Cruise No. AL 80-07), Biochemical Effects personnel sampled 10 stations, including four sea scallop (53 specimens) and seven rock crab collections (68), as well as taking winter flounder livers for Larry Buckley at the Narragansett Laboratory.

A sublethal exposure of sea scallops to the heavy metal cadmium for 60 days was completed, the last experimental exposure of scallops this season; summer temperatures preclude holding this animal during the summer months. A portion of the gill tissues was lyophilized and archived for later ATPase study, and another portion worked up and examined the same week for two enzymes newly added to our repertoire, plus the usual glycolytic group. Frozen adductor muscle samples from previous exposure studies (silver for 30 days and cadmium for 30 days) were similarly analyzed for three new and four regularly tested enzymes. These data are being calculated and analyzed for statistical significance.

Meetings, Talks, Visitors, and Publicity

Miss E. Gould visited the USFWS's Columbia National Fisheries Research Laboratory in Columbia, Missouri, and the Northwest and Alaska Fisheries Center in Seattle, Washington, during the last week of July.

Dr. F. Thurberg attended the 28th International Congress of Physiological Sciences held in Budapest, Hungary, during 13-19 July and presented a paper on "Effects of Cadmium on Benthic Metabolism in the New York Bight," in the Environmental Physiology Division.

During 21-24 June, Jay O'Reilly participated in an ICES working group which dealt with the development of standardized methods for the measurement of primary production. The working group met at The Netherlands Institute for Marine Research in Texel.

Jay O'Reilly and Chris Evans attended a Symposium on Primary Productivity in the Sea which was held at the Brookhaven National Laboratory in Upton, New York, during 2-5 June.

During 2-3 July, Jack Pearce, Carl Sindermann, Bob Reid, Sukwoo Chang, and John LeBaron participated in the monthly meeting of NEMP managers. The meeting included a review of present work at the Milford and Narragansett Laboratories. Gene Heyerdahl and Kay Paine gave presentations to the NEMP management group in regard to current status of our contract for a systems analyst. Finally, Dr. Donald Phelps of the EPA discussed the current joint activities being conducted by our Milford Laboratory and the EPA's Narragansett Laboratory. The next NEMP meeting is scheduled to be held at Easton, Maryland, during 19-21 August. This meeting will emphasize a review of our field activities in connection with remote sensing and the Chesapeake Bay plume studies (Superflux). In addition, the NEMP management group will be planning for vessel scheduling and field activities during the coming fiscal year.

During 7-18 July, Drs. Pearce and Sindermann participated in a US State Department foreign affairs training course. The lecturers in this seminar were from the highest levels of government and included the present Secretary of Agriculture, Mr. Robert Bergland, as well as former Secretary of Commerce, Mr. Elliot Richardson. Some 30 speakers covered topics ranging from human rights in foreign affairs to the status of marine planning as it relates to the development of our foreign policies. Perhaps the one dominant theme that emerged was that while all of the speakers recognized the ultimate importance of resources, expanding human populations, and environmental quality, very few seemed to have developed a coherent policy in regard to dealing with these problems in terms of the foreign policy for the coming decades.

One speaker indicated that he regarded the aforementioned factors as being the principal determinants in the future of this nation and the world, but could offer little in terms of how we deal with these matters.

On 21 July, Dr. Alan Hurlbert and Mr. Jon Witman of the University of New Hampshire visited the Sandy Hook Laboratory to discuss the current progress of their Ocean Pulse/NEMP studies ongoing at Jeffreys Ledge in the Gulf of Maine. The metropolitan area north of Boston and continuing to Portsmouth, New Hampshire, is an area likely to receive considerable industrial development during the coming decades. Principal investigators within NEMP believe that these areas, as well as the areas around Portland, Maine, must be emphasized in terms of our baseline environmental studies.

Frank Steimle met with Bruce Freeman, Director of the New Jersey Division of Marine Fisheries, on 22 July to discuss cooperative summer oxygen monitoring program. Oxygen levels in the New York Bight are presently normal, but a depletion problem of some degree is predicted for later this summer unless there are some strong storms in the area before September.

During 23-25 July, Drs. Pearce and Sindermann participated in the Center Board of Directors meeting concerned with strategic planning. Plans for four major NMFS programs were reviewed and evaluated and corrections were made in the draft plans.

University and Research Institute Relations and Activities

While Frank Steimle's calorimetry lab was vacant during the previously mentioned cruises, Mr. Charles Idelberger, a graduate student working on tilefish at Rutgers University, used equipment to examine the energy content of tilefish livers.

During this month's Albatross IV cruise, we collected sediments from the Boston foul grounds and a nearby control area for EPA Region I to use in bioassays and invertebrate-tissue, contaminant-burden studies.

Publications

Pearce, J. B. The mussel - a bivalve for all seasons. Underwat. Natur. 12(3):4-7;1980. (P)

Tucker, R.; Matte, A. In vitro effects of cadmium and lead on ATPase in the gill of the rock crab, Cancer irroratus. Bull. Environ. Contam. Toxicol. 24:847-852;1980. (P)

AQUACULTURE DIVISION

Aquacultural Genetics Investigation

Dr. S. Lönning from Tromso University in Norway, formerly of the University of Stockholm in Sweden, spent a day at the Milford Laboratory discussing our field data on Atlantic mackerel eggs and embryos and observing methodology. The intent is to use similar approaches in experimental studies in Norway on the effects of crude oil and oil components on fish eggs and embryos.

Mass Selection

Sorting and measuring of the 1978-year-class oysters are completed. This year class now consists of 12 732 oysters. These oysters comprise the F_1 generation (first generation from selected parents) of the mass selection experiment for juvenile gro

rate. There are 4691 oysters in the high (fast-growth) line, 5075 oysters in the low (slow-growth) line, and 2966 oysters in the control line.

Growth data from three crosses in the high line have been analyzed and compared with those from their contemporary control crosses. High-line cross 101 (1661 oysters) was compared with control-line cross 101 (208 oysters). The high-line cross is significantly larger ($P<.001$) than the control cross for shell width, shell length, and total shell area. Both crosses were produced 21 February 1978. The average shell area of the parents of the high-line cross was 35.48 cm^2, compared with 27.89 cm^2 for the parents of the control cross.

Likewise, high-line cross 102 (630 oysters) is significantly larger ($P<.001$) than control-cross 102 (2758 oysters) for all three shell attributes. Both of these crosses were produced on the same day in March 1978. Average shell area of parents in high-line cross 102 was 43.35 cm^2; in the control cross it was 38.65 cm^2.

The third comparison analyzed this month was between high-line cross 103 (462 oysters) and a low-line cross (1469 oysters). In this instance, the low-line cross was significantly larger ($P<.001$) in shell width, length, and area than the high-line cross. Both crosses were produced on 3 April 1978. Parents of the high line averaged 29.61 cm^2 in area; parents of the low line averaged 44.36 cm^2. No reason for the poorer performance of this high-line cross can be given at this time.

A comparison growth rate study has been set up between oysters in two lantern nets introduced into Long Island Sound and oysters kept in the Milford Laboratory seawater raceway system. Different stocking densities are also being studied.

Experimental Inbreeding and Hybridization of Oysters

A small-scale field experiment was initiated (9 July) to compare different "controlled" environments for grow-out of juvenile oyster populations. Three full-sib families of different year classes and sizes comprised the groups to be measured for comparative grow-out in a lantern net in the field (with the cooperation of personnel from the Spawning and Rearing of Mollusks Investigation), in the tank raceway system, and in a suspension dock tray; two subgroups were placed in the recirculating unit (J. Choromanski). Final measurements of the oysters will be made later in the season and will be compared with initial measurements made prior to the animals being placed in the respective grow-out areas. The full-sibs are being utilized to develop inbred lines, which could serve as uniform genetic systems because of their homozygosity, against which to test performance under different environmental conditions.

Additional experiments were conducted with geographic hybrids. An algal diet experiment was set up with three species of algae in trials with hybrid and nonhybrid larvae (V. Lunt). Generally, larvae of local controls survived and grew best in comparison with hybrids and non-local controls on all three algal species fed separately or combined. A second diet experiment involved comparing juvenile and larval food in the growth of older, larger larvae. Juvenile food, which seemed to work in this preliminary trial, might be used to supplement larval food when the larval food is in short supply and larvae are large enough to eat and digest the juvenile food.

In a setting experiment, setting-size larvae of hybrids and controls preferred natural (scallop shell) over artificial (plastic) cultch material, and preferred suspended over bottom cultch material, when given a choice in the same culture.

As mentioned in a previous report, a rust color was observed in late-stage larvae and recently metamorphosed oysters of Texas female x Texas male and New Haven female x Texas male crosses. In contrast, New Haven female x New Haven male "set" were clear to yellow with grayish to black coloration in the bill area. No appreciable pigmentation was observed in early-stage larvae.

It is unusual to find obvious external differences between oyster populations, or even among species, especially in early stages. It would be interesting to determine if there is a genetic basis for the coloration and its mode of inheritance. Hinge-teeth of prodissoconch (late larval) shells are a valuable feature in oyster taxonomy.

One hundred oysters were shipped to a geneticist at the University of Western Ontario in London, Ontario, for a collaborative project on electrophoresis.

Additional experimental animals were received for interspecific hybridization studies which emphasize crosses with the local American oyster.

Cytology and Cytogenetics of Fish

In an effort to develop a rapid and cheap test for chromosome mutagenesis in body tissues of fish, the possibilities of detecting such mutation in the circulating peripheral blood of fish are being measured. The experimental test system consists of adult Fundulus given from 5 to 500 R of X-irradiation at approximately 100 R/min. A field survey of peripheral blood is also being undertaken for several economically important fish species, particularly the Atlantic cod. Other fish in the field survey are yellowtail, summer, and windowpane flounders, haddock, and red and silver hakes.

Spawning and Rearing of Mollusks Investigation

We have previously demonstrated that small (>3 mm) hatchery-reared bay scallops can be quickly and economically grown to a larger seed size (about 20 mm) in a raceway system that utilizes pumped seawater. We recently completed an experiment comparing this raceway system with a system of net enclosures suspended in Long Island Sound. In this test, scallops with a mean length of 6.9 mm initially were grown for 7 wk in the raceway system or in suspended nets. Final average lengths in the nets were between 19.3 and 22.9 mm at stocking densities between 250/m^2 and 5000/m^2. The raceway scallops, grown at 700/m^2, grew to 22.7 mm. No growth advantage is apparent in either system. We will do an economic analysis of the two methods soon.

Last year we successfully used vertically deployed Japanese-style lantern nets to grow bay scallops to market size. We have initiated two major field experiments to assist us in the economic analysis of this grow-out technique. These experiments are designed to give us adequate information on optimal stocking densities for scallops of various sizes and to determine if periodic net handling to reduce fouling and allow for stocking density changes is warranted. These experiments, and parallel tests to be initiated in August, will be terminated in December.

Surf clams being reared in our pumped raceway system at five densities between 100/m^2 and 333/m^3, show only slight variation in growth. During the experimental period from June through July, the level of ambient natural phytoplankton was relatively high, indicating that nutrition was not a limiting factor. Clams that were an average length of 23 mm in early June had grown to an average length of 37 mm by late July. There was no significant mortality in any of the treatments. The rapid growth rate recorded is comparable to that of similarly sized clams grown during the past three seasons.

Preliminary results indicate that among groups of surf clams grown from 1 to 4 mm, those fed a mixture of five algal species showed the greatest growth. Clams fed only "larval" algal species of Isochrysis and Monochrysis grew significantly more than those fed only "juvenile" algal species of Chlorella, Dunaliella, and Phaeodactylum. These results corroborate the hypothesis that many algal species complement each other to provide a superior nutritional source for bivalves.

Meetings, Talks, Visitors, and Publicity

At our request, NOAA Translation Services has just completed a translation of the proceedings of a Japanese symposium on genetics as applied to aquaculture and fishery sciences: 1979 Proceedings of the Special Symposium on the Present Status of Fish Genetics and Future Prospects of Breed Improvement.

Ron Goldberg and Jim Widman have completed a course in underwater photography.

Visitors this month to the Milford Laboratory included Robert Crussons of Brittany, France; Bill Robinson of Northeastern University; Steve Dunn and Dr. Dianne Brousseau of Fairfield University; and George Giddings of Santiago, Chile.

Ed Rhodes gave a lab tour to the marine biology class from Fairfield University. Ed Rhodes and Renée Mercaldo have trained two employees of the Aquaculture Division of the Connecticut Agriculture Department in identifying oyster larvae in plankton samples and counting oyster spat on shell collectors.

Scallops for research purposes have been given to Rod Taylor of WHOI and Fred Lipschultz of the Marine Biological Laboratory in Woods Hole, Massachusetts.

PATHOBIOLOGY DIVISION

Comparative Invertebrate Pathology Investigation

Dr. Iracema A. Nascimento from the Federal University of Bahia in Brazil is visiting the Oxford Laboratory for a period of 1-2 mo. Dr. Nascimento will be studying the pathology of various marine organisms, particularly mollusks. She is now working with Mr. Kern on a manuscript that reports the results of their cooperative studies on oyster mortalities in Todos os Santos Bay, Brazil.

Collection and histologic preparation of Ocean Pulse Program samples of blue mussels are continuing. An experiment was performed to determine whether modifications in embedment and fixation would result in better histologic preparations of glutaraldehyde-formaldehyde fixed tissues. Preliminary results indicate that: (1) DMSO in the fixative may cause tissue separations, and (2) chloroform embedment is far superior to xylene, producing non-brittle tissues which section without chatter.

Studies on hormonal stress and viral infection of blue crabs were initiated. Within 4 hr after eyestalk ablation, 22% (5/23) of the crabs had died, and within 3 days, 78% (18/23) of the ablated animals were dead. During the same period, 2 of 12 control crabs died. Gross examination of 10 of the ablated animals and histological examination of 10 other ablated animals over a 4-day period indicated that acute bacterial infection was not involved. Four of five crabs dying on day 0 had preexisting obvious or presumed viral infections. Viral infections also occurred in the control group. Most of the ablated animals may have died due to stress caused by wounding being imposed on existing viral infection. Water temperatures at the time of the experiment were high, adding to stress by speeding up metabolism and probably increasing viral growth in the crabs. Whether hormonal imbalance itself was a factor in the later deaths cannot be determined. Repeating the experiment when water temperatures are lower may provide the answer.

Preparation for the July Ocean Pulse cruise was finalized. Equipment and instructions for collecting and handling of planktonic crustaceans for pathobiologic studies were provided to William Brennan, a technician assigned to the Albatross IV. Neuston and bongo tows will be made at all stations with priorities on the 10-mi transects to DWD 106, the New York Bight acid-waste dumpsite, and Georges Bank stations. The samples collected by Linda Dorighatti, who participated in the second leg of the cruise, will be sorted and catalogued according to our standard procedures. Euphausids

will be identified specifically and examined grossly and histologically in the continuing study on the parasites and pathology of these organisms.

Euphausid gills fixed in gluteraldehyde-seawater or seawater-formalin and stored in 70% ethyl alcohol were processed for scanning electron microscopy. Preliminary observations on these preparations showed an unusual appearance to the surface of the gill lamellae. As yet, it is not certain if this is an actual phenomenon or an artifact of processing. Further material will be processed for scanning electron microscopy and transmission electron microscopy to determine the regularity of this phenomenon.

During the month, the histology lab cut 736 tissues and stained 711 slides from a variety of marine fish and shellfish.

Fish Pathology Investigation

Manuscript preparation occupied the time of several members of the Fish Pathology Investigation. Dr. Murchelano prepared a manuscript on "An International Registry of Marine Pathology" and Mr. Newman prepared one on "IPN Virus Disease of Clupeid Fishes." Both manuscripts have been submitted as invited papers to the ICES Special Meeting on Diseases of Commercially Important Marine Fish and Shellfish to be held in Copenhagen, Denmark, during 1-3 October 1980.

Approximately two-thirds of the sand lances (Ammodytes spp.) collected during the spring bottom trawl survey have been X-rayed. The remainder should be completed by mid-August. With the addition of specimens from summer and fall cruises, plus specimens collected on EPA cruises to the Delaware Bay dumpsite, it is hoped that the total collected in 1979 and 1980 will exceed 3000 specimens.

A meeting was held at the Oxford Laboratory which included attendees from the Virginia Institute of Marine Science and the Maryland Tidewater Fisheries Administration to discuss the problem of parasitic roundworms and ulcers in Chesapeake Bay American eels being exported to northern Europe. With the aid of scanning electron micrographs prepared by Dr. Ann Scarborough, the nematodes have been positively identified as larval Eustrongylides sp., a genus which has previously been reported to occur in European eels. Histopathological studies of ulcerous lesions of these eels show that they are probably of bacterial origin and not related to the nematode infections.

Dr. Bodammer spent a major portion of this reporting period in the lab of Dr. Russell L. Steere of the USDA Plant Protection Institute in Beltsville, Maryland, where he received instruction in freeze-fracture methods for electron microscopy. The purpose of the training was to permit him to use this technique in the investigation of contaminant effects, principally of heavy metals, on the olfactory membranes of juvenile fish and on the cellular junctions in the epidermis of larval fish. Presently the effects of toxic compounds on cell membranes are generally not well understood. The freeze-fracture technique permits examination of the structure of the cell membrane and changes in its macromolecular organization that may result from exposure to toxic compounds. Dr. Bodammer's use of the technique will be limited to examining the effects of copper on olfactory and integumental tissues.

Microbial Ecology and Parasitology Investigation

Richard Greig from the Milford Laboratory visited Oxford to review the present status of cooperative work on heavy metal levels and tissue pathology in the rock crab. Preliminary studies were designed to take into account molting behavior and seasonal movement in order to introduce predetermined variables within the sampled population.

During the first phase of the study, small samples of 25 specimens were analyzed for metal levels in gill tissue and smaller numbers were analyzed for metals in the hepatopancreas. Data from the seasonal samples showed that there was a wide range in metal concentrations in the hepatopancreas with little or no evidence of a seasonal influence. In contrast, crabs taken during the molting cycle had gills in which copper levels were 1 to 10 times lower than they were during the intermolt period. Subsequent to the 25-crab sampling regime, a 50-crab sample was collected at the extreme end of the molting period and data from the larger sample were in direct agreement with observations from the introductory study. Values obtained for copper, silver, cadmium, and lead are now being plotted and analyzed for a statistical interpretation of which levels may be considered typical and which are skewed to the right and left of several deviations from mean values. At the same time, we are developing a condition index to compartmentalize the health of the crabs into distinct subgroups, i.e., clean gills - newly molted, clean gills - intermolt, black gills - tissue pathology, black gills - no tissue pathology, etc. When the two sets of data--(1) metal level subgroups, (2) tissue condition subgroups--are tabulated, correlation tests will be conducted to determine whether or not metal burdens are associated with crustacean health as determined at the bright-field microscope level. Our new data are expected to provide a rational for the design of further work in which specific questions may be investigated in both clean and stressed environments.

Studies on the distribution of pathogenic amoebae in coastal waters are continuing to support our hypothesis that such protozoa are abundant in seabottoms with high bacterial populations. A cruise report on cooperative work in Narragansett Bay has been completed and will soon be distributed to NMFS laboratories. Cooperative studies have enabled us to firmly establish the identity of the amoebae as either belonging to known genera, or representing new and previously unknown species. The etiology of amoebic meningoencephalitis in humans has baffled investigators throughout the world and a conference on the biology of small free-living amoebae is now being held every 2 yr. The collection and presentation of scattered observations at such conferences have led to a better understanding of the problems at hand, and have allowed us to develop a reasonable hypothesis on the significance of the amoebae in the marine environment. Disease and/or death in humans is now recognized to occur in stressed or debilitated individuals. Lab studies have shown that species of Acanthamoeba are highly susceptible to the defense mechanisms of healthy individuals and such individuals may undergo a spontaneous recovery without overt signs of disease. In contrast, those with poor immune systems fail to localize amoebic infections and succumb to the disease. Current medical statistics suggest that debilitated individuals are most likely to come to the attention of physicians when amoebic disease is associated with skin ulcers, diabetes, cirrhosis of the liver, pneumonia, or Hodgkin's disease. Our cooperative work with investigators from EPA, FDA, and the US Public Health Service has shown that marine sediments containing high populations of sewage-associated bacteria are indeed the optimal sites for isolating the pathogenic and nonpathogenic species of Acanthameoba. The amoebae are not believed to present a hazard to human health except when an individual with a deficient immune system becomes accidently exposed to the pathogens. Concurrently, the amoebae are now recognized as excellent indicators of sewage accumulation and dispersion. Techniques for estimating MPN's for the amoebae are now being developed and it is likely that they will surpass fecal bacteria in their utility for monitoring studies where such bacteria are no longer viable.

Diseases of Larval Mollusks Investigation

Dr. Blogoslawski conducted a 1-wk series of ozone-chlorine depuration experiments in La Paz, Mexico, using Argopecten circularis. Doses of both oxidants in seawater were varied from 0.5 to 3.00 ppm by 0.5-ppm increments with scallops placed in the treated seawater for 1-3 hr. Treated and untreated scallop meats were subjected to total coliform, fecal coliform, total plate count, and taste tests. For both oxidants, preliminary results were very encouraging.

Four suspect bacterial shellfish pathogens were received from Monterey Abalone Farms in Monterey, CA. Two challenge tests using 10^4 cells/ml revealed no significant mortality to American oyster larvae. Seventy-five biochemical and morphological tests are being used to identify these unknown organisms. From initial results, it appears that none of the isolates are similar to CA 10, a Vibrio anguillarum-like organism collected at another shellfish hatchery 6 mi from Monterey Abalone Farms.

A request from the Bluepoints Co. involved a sampling trip to Great South Bay, Long Island, where surface and bottom water and sediment samples were microscopically examined for predominant flora and plated for isolation of bacteria pathogenic to clam larvae. A Chaetoceros sp. was found in bloom proportions; it was concentrated and cells and filtrate (0.45-μ filtered water) were then added to cultures of 24-hr-old clam larvae. The filtrate (algal metabolites) had no adverse effect on clams. Clams containing the cells showed higher mortality than controls by the 3rd day in one experiment. At this time, the findings are not conclusive.

Two sampling cruises to Long Island Sound oyster beds were completed this month. Since shellfish larvae were found in New Haven areas, an additional cruise is planned for late in the month. A 1-yr summary of this work will be presented at the regional meeting of the American Society for Micribiology in Lake Luzerne, New York, on 27 September.

Experiments using fertilized oyster eggs showed that the toxic fraction of the concentrated filtrate of a pathogenic Vibrio sp. is present in one of the minor bands developed on electrophoretic gels. None of the other bands was able to affect embryonic development. The molecular weight of the toxin is being estimated.

Last month it was noted that elevated bacterial numbers were found in some oyster larval cultures. Experiments have shown that a Pseudomonas sp. isolated from one of the cultures is pathogenic to oyster larvae.

A number of miniaturized multiple-test systems are currently being marketed for identification of bacterial isolates. Although it is apparent through anecdotal information that several of these systems are being used for identification of marine bacteria, no studies have been done to evaluate their accuracy. Four weeks of data analysis have culminated in a manuscript comparing two of these systems, the Minitek and the API-20E, with conventional reactions for 31 bacterial isolates from eroded fins and ulcers of marine flatfish and 30 bacterial isolates from diseased oyster larvae or algal cultures. Only 3 of 19 substrates in the API-20E system and 3 of 31 substrates from the Minitek system had high positive correlation with conventional tests (with an additional two marginally correlative substrates from the Minitek system). Further, the overall levels of false reactions recorded for selected bacterial genera were usually too high for reliable bacterial identification for our purposes. Consequently, without modification, neither of these multiple-test systems is suitable for our routine use with isolates from marine fish or oysters.

Meetings, Talks, Visitors, and Publicity

Dr. Rosenfield and delegates from other Federal agencies and academia (six altogether) participated in the US Aquaculture Delegation to China, and also visited aquaculture and fisheries laboratories in Hong Kong, Macao, and the Philippines.

Ms. MacLean participated in an IYABA meeting held at the Gloucester Laboratory on 30 June and 1 July.

Dr. Murchelano attended a Habitat Protection Strategic Planning Meeting at the Narragansett Laboratory on 2 and 3 July; he also attended meetings of the Center Board of Directors and the Center Promotion Review Board at the Woods Hole Laboratory during 23-25 July.

Ms. Dorighatti participated in an Ocean Pulse cruise aboard the Albatross IV during 7-23 July.

Ms. Hines, Ms. Wade, and Ms. MacLean attended a NOAA workshop of the Federally Employed Women's 11th National Training Program in Washington, DC, on 8 July.

Dr. Brown from the Milford Laboratory attended a US Office of Personnel Management training program titled "The Federal Women's Program: Directions for the Eighties" and the Federally Employed Women's 11th National Training Program in Washington, DC, during 9-12 July; Dr. Brown also attended an "Employer Workshop" sponsored by the Lincoln University Cooperative Education Program in Lincoln University, Pennsylvania, on 24 July.

Mr. Newman consulted with colleagues at the USFWS National Fish Health Laboratory in Leetown, West Virginia, on 15 July concerning viral diseases of clupeid fish.

Ms. Swing visited the National Institutes of Health in Bethesda, Maryland, with Dr. Scarborough on 15 July to learn the use of the scanning electron microscope.

Dr. Johnson and Mr. Kern attended the annual meeting of the Society for Invertebrate Pathology during the week of 28 July. Dr. Johnson was installed as President of the Society, attended Council and Trustee meetings, and presented a paper on "The Fixed Phagocytes (Macrophages) of Decapod Crustaceans." Mr. Kern also presented a paper titled "Oyster Mortalities in Todos os Santos Bay, Salvador, Bahia, Brazil."

Two seminars were presented to the staff during the month. The first was presented by Mr. William Shaw of the NOAA Marine Advisory Service in Washington, DC, on 1 July on his recent trip to Japan to attend a meeting of the United States-Japan Natural Resources Commission's Aquaculture Panel. The second was given by Mr. Kern on 16 July on the "Incentive Awards System."

Visitors to the Oxford Laboratory during the month included Dr. Iracema Nascimento of the Federal University of Bahia in Brazil; Dr. M. Cross of the University of Delaware in Newark, Delaware; Mr. Howard King of the Maryland Department of Natural Resources in Annapolis; Mr. John Cookson of the NMFS Northeast Regional Office in Gloucester, Massachusetts; Ms. Ann Bogat of Owings Mills, Maryland; Robin Whitby, Mike Butler, and Martin Walker of Easton, Maryland, Sandy Whitby of Trappe, Maryland, and Lenny Mullikin and Donald Gollaway of St. Michaels, Maryland, all members of the Youth Conservation Corps; and Dr. Arnold Eversole of Clemson University in Clemson, South Carolina.

Publications

Brown, C. A study of two shellfish pathogenic Vibrio strains isolated from a Long Island hatchery during a recent outbreak of disease. Proc. Nat. Shellfish. Assoc. (S)

Petti, L.; Tettelbach, S.; North, E.; Nawoichik, B.; Blogoslawski, W. Occurrence of bacteria pathogenic to oyster larvae: a Long Island Sound study. Amer. Soc. Microbiol. (S)

Robohm, R. A. Early phagocyte activation in a larval mollusk exposed to pathogenic Vibrio sp. Abstr. Annu. Meet. Amer. Soc. Microbiol.; 1980:71 (abstract E 124). (P)

Robohm, R. A. In vitro phagocytosis by molluscan hemocytes: a survey and critique of methods. Comp. Pathobiol. Ser., Plenum Press. (A)

Reports

Johnson, P. T. Diagnosis of crustacean diseases. Int. Counc. Explor. Sea, Comm. Mem.;1980. 8 p.

Murchelano, R. A.; Rosenfield, A.; Swann, B. J. An International Registry of Marine Pathology. Int. Counc. Explor. Sea, Comm. Mem.;1980. 9 p.

Newman, M. W. IPN virus disease of clupeid fishes. Int. Counc. Explor. Sea, Comm. Mem.;1980. 5 p.

Sawyer, T. K.; Lewis, E. J.; Galasso, M.; Bodammer, S.; Ziskowski, J.; Lear, D; O'Malley, M.; Smith. S. Black gill conditions in the rock crab, Cancer irroratus, as indicators of ocean dumping in Atlantic coastal waters of the United States. Int. Counc. Explor. Sea, Comm. Mem.;1980. 7 p.

Sawyer, T. K.; Rosenfield, A.; Perkins, F. O.; Zwerner, D.E.; Dias, R. K.; Lichtenfels, J. R.; Madden, P.A.; Jackson, G. J.; Bier, J. W.; Payne, W. L.; Miller, G. C. Identification of parasitic nematode larvae in the calico scallop, Argopecten gibbus (Linn.), and the surf clam, Spisula solidissima. Int. Counc. Explor. Sea, Comm. Mem.;1980. 6 p.

NATIONAL SYSTEMATICS LABORATORY

Pelagic Fishes Investigation

A first draft was completed of an annotated catalog of the Scombridae of the world for United Nations Food and Agriculture Organization. Comparisons were made of North and South American populations of Scomberomorus cavalla.

Benthic Fishes Investigation

Final revisions were made on a manuscript reviewing the taxonomy of the blue hake (Antimora).

Crustacea Investigation

Work continued on a handbook of the decapod crustaceans of the temperate-water eastern US. Contact was made with the Smithsonian Press concerning the possibility of publishing the manuscript as a book.

Meetings and Talks

The Washington, DC, District of the American Institute of Fishery Research Biologists met on 7 July at the National Museum of Natural History, where D. M. Cohen discussed National Systematics Laboratory research projects and led a brief tour of the Laboratory and the Museum fish collection and facilities.

Visitors

Visitors included Dr. Labbish Chao of the Universidad de Rio Grande do Sul in Brazil who is studying sciaenid fishes; Dr. James Nold of the Armed Forces Institute of Pathology for identification of a scabbard fish with hyperostosis; R. Schonecht of Cornell University; and K. Sulak and J. Carter of the Virginia Institute of Marine Science for literature research on East Coast continental slope fishes.

Publications

Collette, B. B. Specimen banking marine organisms. In Proceedings of the International Workshop on Monitoring Environmental Materials and Specimen Banking;1980:165-167. (P)

Collette, B. B. Scombridae. In Check-list of fishes of the eastern tropical Atlantic. (S)

Pérez Farfante, I. Revision of the penaeid shrimp genus Penaeopsis (Crustacea: Decapoda). Fish. Bull. (US) 77(4):721-763;1980. (P)

Williams, A. B.; Williams, D. M. Carolinian records for American lobster, Homarus americanus, and tropical swimming crab, Callinectes bocourti: postulated means of dispersal. Fish. Bull. (US). (A)

Yabe, M.; Cohen, D. M.; Wakabayashi, K.; Iwamoto, T. Fishes new to the eastern Bering Sea. Fish. Bull. (US). (S)

ATLANTIC ENVIRONMENTAL GROUP

Ocean Monitoring and Climatology Task

The cooperative Ship of Opportunity Program obtained six XBT transects and two continuous plankton recorder (CPR) transects in July: two XBT and one CPR transects in the Gulf of Maine; one XBT transect off Southern New England; one XBT transect across the shelf and slope off New York; one XBT and CPR transect out of Norfolk, Virginia; and one XBT transect across the Gulf of Maine.

The following announcement of eddy conditions in the Georges Bank - Middle Atlantic Bight area was sent to the Commander of the Atlantic Area for the US Coast Guard for publication in the August issue of Atlantic Notice to Fishermen:

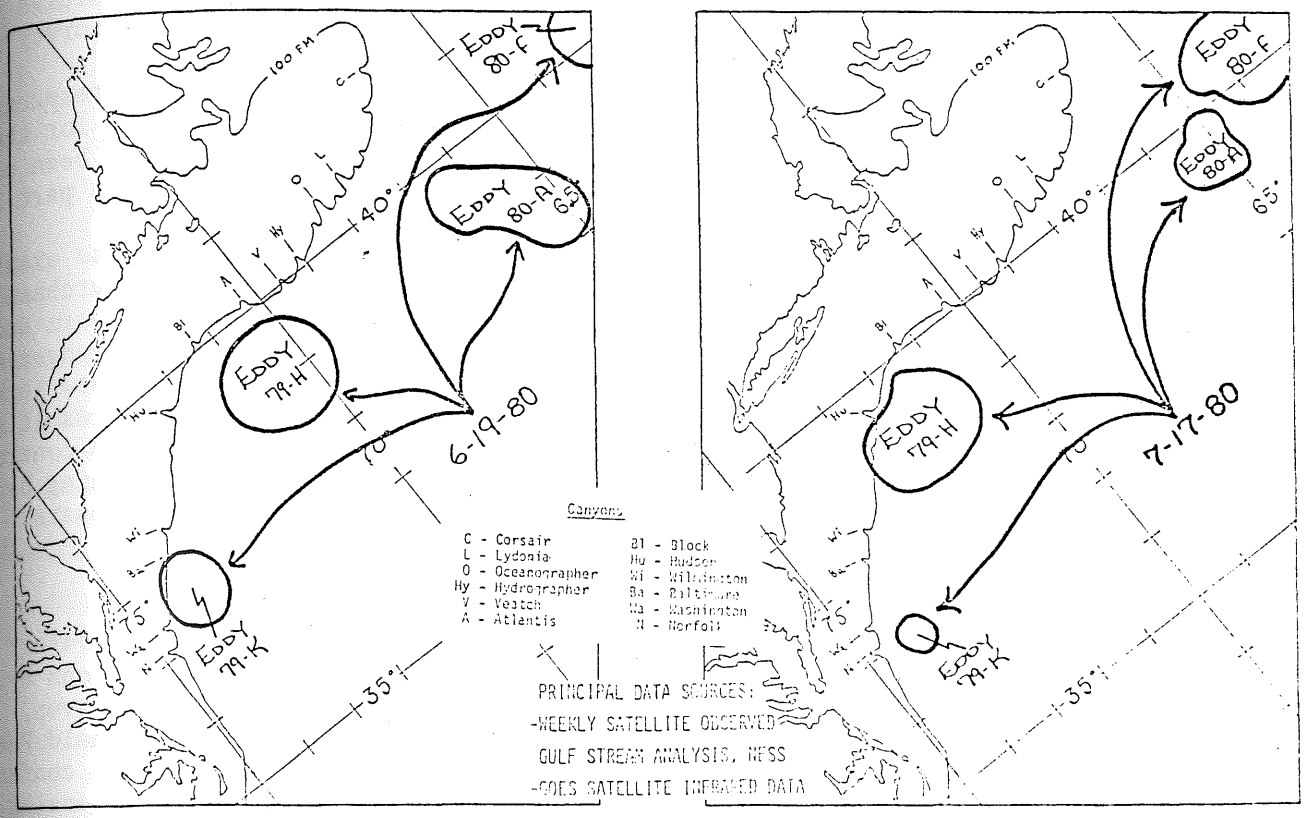
GULF STREAM EDDY LOCATIONS AEG/July 18, 1980

The Atlantic Environmental Group of the National Marine Fisheries Service reports that there were four warm core Gulf Stream eddies present off the northeast coast of the United States in mid-July.

Eddy 79-K moved 71 km (38 nm) to the south along the continental slope and is currently being resorbed by the Gulf Stream at 36.9°N, 74.1°W, east of Norfolk Canyon. Eddy 79-H traveled 121 km (65 nm) west to a center position at 38.9°N, 71.9°W, southeast of Hudson Canyon. Eddy 80-A was partially entrained by a Gulf Stream meander and traveled northeast 65 km (35 nm) during the past 30 days. The eddy is now centered at 39.5°N, 65.2°W, southeast and far offshore of Corsair Canyon. Eddy 80-F advanced west for 77 km (42 nm) to a center position at 40.3°N, 63.7°W, southeast of Corsair Canyon and far offshore of the 100 fm line.

During the next 30 days Eddy 79-K will be completely resorbed by the Gulf Stream and Eddy 79-H may move south to a position east of Wilmington Canyon. Eddy 80-A may become completely resorbed by the Gulf Stream or it may move west to a position centered southeast of Lydonia Canyon. Eddy 80-F may move southwest to a center position south and offshore of Corsair Canyon.

Fishermen are requested to report unusual conditions or catches occurring in the vicinity of these eddies to the Director, Atlantic Environmental Group, National Marine Fisheries Service, RR 7, South Ferry Road, Narragansett, Rhode Island 02882, by mail. Updates on eddy positions and general information on Gulf Stream eddies may be obtained by calling the Atlantic Environmental Group (401-789-9326).



The fifth and last report in the annual series portraying natural environmental variations in US coastal waters was released this month. Titled "Marine Environmental Conditions Off the Coasts of the United States - January 1978-March 1979," the report has been published in the NOAA Technical Memorandum series with a publication data of May 1980. Elizabeth Haynes of the NMFS Office of Science and Environment and Mert Ingham of AEG were responsible for compiling the Atlantic and Gulf coastal information for this report. A decision was made to terminate this topical series with this report because of apparent lack of interest among NMFS scientists and managers in receiving or utilizing the reports.

The Unifax II Goesfax picture receiver is presently being installed. When completed, during the next week, enhanced infrared imagery from GOES, TIROS-N, and NOAA-6 satellites will be received real time via the Washington Satellite Field Services Station. Telephone line installation is complete. In order for the receiver to become more fully effective and efficient on a 24-hr schedule, a timed channel-switching unit is desirable and is currently being investigated.

Ocean Dumping Studies Task

Jim Bisagni traveled to Norfolk, Virginia, for the staging of a research cruise to DWD 106 aboard the Mt. Mitchell during 7-16 July. All operations were completed

including cooperative work with the Ocean Pulse Program. A preliminary cruise report was produced and is presently under review at the National Ocean Survey's Atlantic Marine Center. The report should be distributed shortly.

Preparations are underway for supplying operational STD (salinity-temperature-depth) and XBT systems and two TIROS-N ocean drifting buoys to the Kelez for the 9-28 August ocean dumping cruises. Radar-transponder-drogued buoys have been constructed and have undergone final at-sea testing. John Hartley will take part in both August cruises.

Jim Bisagni and John Hartley traveled to Falmouth, Massachusetts, to examine and learn the operation of the TIROS-N ocean drifting buoys which were purchased from Ocean Research Equipment, Inc., (ORE). Service ARGOS identification numbers and transmitter repetition rates were keyed into the buoys at this time. Arrangements were made for ORE to ship the buoys to Floyd Bennett Field in Brooklyn, New York. Final forms and arrangements were completed with Service ARGOS and will result in the buoys being activated on 6 or 7 August at dockside in Brooklyn. The NOAA contract with Service ARGOS will be terminated on 1 December 1980 with future funding being supplied by each NOAA main-line component organization on a per-project basis.

Meetings, Talks, Visitors, and Publicity

The July meeting of NEMP managers was held at the Narragansett Laboratory on 1 and 2 July. Brief reviews of ongoing NEMP projects included presentations by: Richard Cooper, Eugene Heyerdahl, Larry Buckley, Jim Bisagni, Peter Hargraves, Frederick Thurberg, Edith Gould, John Graikoski, Arlene Longwell, and Donald Phelps.

Woody Chamberlin traveled to Suitland, Maryland, during 6-8 July to confer with National Environmental Satellite Service scientists on providing remote sensing products for AEG and to consult with NASA scientists on obtaining Coastal Zone Color Scanner data from the NIMBUS-7 satellite.

Jim Bisagni participated in a research cruise to DWD 106 aboard the Mt. Mitchell during 7-16 July. All operations were completed including cooperative work with the Ocean Pulse Program.

On 9 July, Woody Chamberlin attended a meeting, held at Hanscom Air Force Base in Lexington, Massachusetts, of the Alternative Design Committee for the remote sensing system.

Mert Ingham attended the Center Board of Directors meeting held at the Woods Hole Laboratory during 23-25 July.

Steve Cook traveled to New York to confer with the Merchant Marine Academy training representative at Kings Point on 23 and 24 July.

Publications

Aiken, J.; Wood, G. B.; Jossi, J. W. The Undulating Oceanographic Recorder Mark 2: a new ship-of-opportunity ocean monitoring instrument. OCEANS '80;Seattle, Wash.;1980 September. (A)

Armstrong, R. S. Transport and dispersion of potential contaminants at the Buccaneer Oil Field. EXPOCHEM '80;Houston, Tex.;1980 October. (A)

Celone, P. J.; Chamberlin, J. L. Anticyclonic (warm core) eddies off the northeastern United States during 1978. Ann. Biol. 35. (A)

Cook, S. K.; Hughes, M. M. Water column thermal structure across the shelf and slope southeast of Sandy Hook, NJ USA in 1978. Ann. Biol. 35. (A)

Crist, R. W.; Chamberlin, J. L. Bottom temperatures on the continental shelf and slope south of New England during 1978. Ann. Biol. 35. (A)

Crist, R. W.; Chamberlin, J. L. Bottom temperatures on the continental shelf and slope south of New England during 1979. Ann. Biol. 36. (S)

Fitzgerald, Jayne; Chamberlin, J. L. Anticyclonic warm core Gulf Stream eddies off the northeastern United States during 1979. Ann. Biol. 36. (S)

Hilland, J. E. Variation in the shelf water front position in 1979 from Georges Bank to Cape Romain. Ann. Biol. 36. (S)

Hilland, J. E.; Armstrong, R. S. Variation in the shelf water front position in 1978 from Georges Bank to Cape Romain. Ann. Biol. 35. (A)

Hughes, M. M.; Cook, S. K. Water column thermal structure across the shelf and slope southeast of Sandy Hook, New Jersey in 1979. Ann. Biol. 36. (S)

Ingham, M. C.; McLain, D. R. Sea surface temperatures in the northwestern Atlantic in 1978. Ann. Biol. 35. (A)

Ingham, M. C.; McLain, D. R. Marine environmental conditions off the Atlantic and Gulf Coasts of the United States January 1978 - March 1979. In Marine environmental conditions off the coasts of the United States January 1978 - March 1979. NOAA Tech. Memo. NMFS-OF-5;1980. (P)

McLain, D. R.; Ingham, M. C. Sea surface temperatures in the northwestern Atlantic in 1979. Ann. Biol. 36. (S)

Reports

Bisagni, J. J.; Kester, D. R. Physical variability at an East Coast United States offshore dumpsite. Proceedings of the First International Ocean Dumping Symposium;1978 October.

Fitzgerald, J. L.; Crist, R. W. Record diameter warm core eddy off Hudson Canyon. Coast. Oceanogr. Climatol. News.