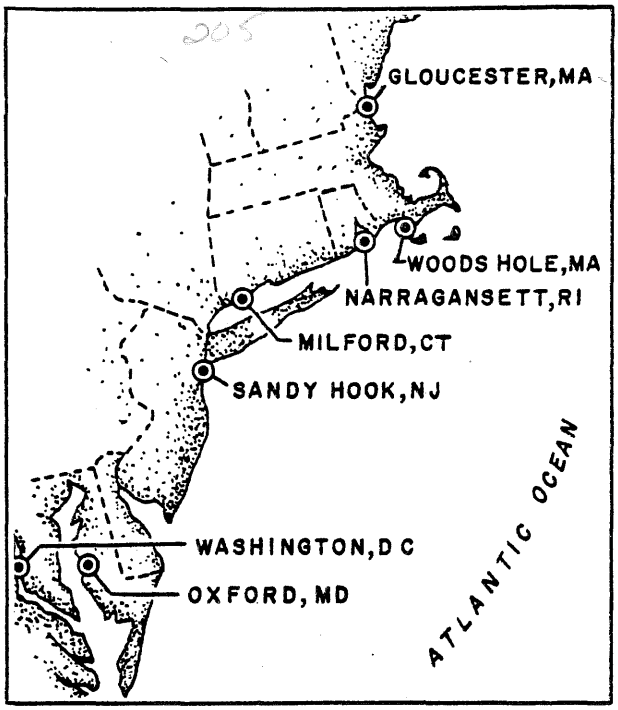
NEFC

Northeast Fisheries Center

NEWS



JANUARY 1980

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

CENTER DIRECTORATE

Environmental Management Office (December only)

Drs. Sindermann and Pearce participated in a series of NOAA interoffice (Fisheries, Research and Development, and Ocean and Atmospheric Services) working group meetings during December which resulted in completion of a prospectus and program development plan for pollution monitoring in the Northeast. The program is called the "Northeast Pollution Monitoring and Research Program" (NEPMAR). It integrates efforts of these three NOAA offices, including much of NEFC's Ocean Pulse Program.

The Interagency Aquaculture Subcommittee of the federal government recently formed a Panel on Fish Health, with Drs. Sindermann and Rosenfield as members. The first meeting of the panel was held in Washington, DC, on 4 December. Plans were made for preparation of a national inventory of fish and shellfish diseases.

Special Scientific and Technical Projects Office

Repair work was performed on the NOAA R/V Delaware II's main trawl winch. In the process, plans were made on how to improve the capabilities of the winch and hopefully work will progress in this direction soon.

The title credits and illustrations for the final version of the sea scallop gear video tape were made and taped. All video equipment on hand is completely scheduled for the next several months by various programs.

A small sea scallop trawl was constructed and will be tested next month. The 1.5-inch mesh trawl will be used to catch small scallops for age and growth studies as well as to locate scallop beds for gear trials.

A teletype print-out format was devised for the NOAA R/V Albatross IV's CAMAC (computer automated measurement and control) data logging system and forwarded to the National Ocean Survey's (NOS) Office of Fleet Operations.

Technical assistance was provided to more than a dozen constituents.

RESOURCE ASSESSMENT DIVISION

Resource Surveys Investigation

On 3 January, the Delaware II departed on a shellfish resource assessment survey directed toward surf clams and ocean quahogs. The planned area of operations is between Nantucket Shoals and Cape Hatteras and seaward out to the 100-m (60-fathom) contour. Chuck Byrne was chief scientist. The scheduled ending date was 2 February, but due to vessel breakdowns, NOS has increased the number of sea days available and the cruise is now scheduled to end on or before 14 February. Scientific personnel were exchanged at the Atlantic Marine Center in Norfolk, VA, on 30 January. Prior to the in-port period in Norfolk, 146 dredge stations were completed.

Liz Bevacqua recently joined the Survey Unit and has been working on the Bureau of Land Management (BLM) final report as have Harold Foster and Chuck Byrne. Significant progress has been made and the report is progressing well.

Henry Jensen assisted State of Rhode Island biologists in planning a cooperative yellowtail flounder bottom trawl survey. The State of Rhode Island, fishermen's associations from Point Judith, RI, and New Bedford, MA, as well as the NEFC, are cooperating in this effort. The survey is designed to investigate the distribution and relative abundance of yellowtail flounder in Southern New England waters during the winter months.

Warren Handwork spent 3 wk training some of the newer crew members of the Albatross IV in the building and repair of standard survey trawl gear. This was carried on while the Albatross IV was in a shipyard for annual maintenance. Also during January, Warren built a No. 35 Yankee trawl at the request of NOS (to be used aboard the NOAA R/V Kelez), and a 25-ft scallop trawl to be used in gear studies by Ron Smolowitz. All this was in addition to preparing three trawls for the Albatross IV (for the upcoming cruise to the Gulf of Mexico), two trawls for the Polish R/V Wieczno (yellowtail flounder survey), and making spare sections for No. 36 Yankee survey trawls.

Jim Crossen and Pat Twohig were both involved with the surf clam cruise. Jim participated both at sea and ashore, while Pat spent time ashore working with one of the survey dredge's electric motors and the primary power cable after a breakdown. After thorough examination, both the motor and cable were shipped to the respective manufacturers for repair.

Additional TV recording equipment was purchased to record scientific operations aboard the vessels during cruises of interest. NEFC TV systems were issued to record gear performance aboard the NOAA R/V Rorqual and collection procedures aboard the Albatross IV during the Gulf of Mexico cruise.

An instrumentation package (to record trawl net performance) was supplied to the Fisheries Engineering Investigation at the Gloucester Laboratory. This package will be used during the developmental stages of a new juvenile fish sampling system.

An electronic load cell was put aboard the Delaware II to be evaluated during the clam survey. It is hoped that this scale will replace the presently used beam balance.

Fishery Biology Investigation

Finfish

Brenda Fields, a new cooperative education student from South Carolina State College, began working part time with the Finfish Group. She began impressing and aging summer flounder scale samples from research cruises. A volunteer student from Miss Porters School, Amy Taft, helped to impress the summer flounder scales.

Cathy Rearden continued organizing data for the age and growth archiving project and began work with Louise Dery on a red hake otolith age validation study. She also began sectioning red hake collected during the summer 1979 bottom trawl survey.

Louise Dery continued sectioning silver hake collected during the fall 1979 bottom trawl survey and processed fall 1979 survey-collected Atlantic herring and Atlantic mackerel samples. Most effort this month, however, was directed to training personnel for new projects.

Age and Growth

Kris Andrade completed aging the third quarter 1979 commercially landed haddock samples and also all of the haddock samples from the Georges Bank area for the fall 1979 bottom trawl survey cruises (Albatross IV Cruise No. AL 79-12 and Delaware II Cruise No. DE 79-10).

Vi Gifford completed summarizing all four quarters for the 1978 commercially landed redfish samples. She then picked out all of the 1971 year-class otolith sections from the 1976-78 commercially landed and survey-collected samples which will be used for an age validation of redfish.

Judy Penttila completed aging 1605 commercially landed yellowtail flounder samples from the fourth quarter of 1979. She also participated along with Ambrose Jearld, Jr., in the final meeting at Cambridge-IMANCO in Monsey, NY, to review the software they have developed to age haddock on their Quantimet System 25.

Shellfish

The shellfish resource assessment survey (Delaware II Cruise No. DE 80-01) commenced 4 January 1980. Loretta O'Brien participated on the first leg and John Ropes participated on the last leg which extended into February. Loretta completed aging sea scallops for survey Strata 45-52 of the fall 1979 scallop survey. She also completed arrangements for a sampling trip to test a new scallop trawl designed to catch YOY's (young-of-the-year)- prerecruits for a sea scallop age, growth, and maturation project.

John Ropes supervised three Smith College student volunteers in assisting with the initial step in developing a technique for aging ocean quahogs. Most of their efforts were in cutting shells, polishing shells, and preparing acetate peels and photographs. John and Steve Murawski worked together on making measurements from, and photographing, marked ocean quahogs recovered from a planting site.

Sandy Hook Investigation

The Sandy Hook Investigation hosted the First Mid-Atlantic State/Federal Assessment Workshop in January. A total of 14 representatives from the Mid-Atlantic States, North Carolina through New York, attended along with one representative of the Mid-Atlantic Fishery Management Council (MAFMC). An additional 14 NMFS personnel from NEFC and the Northeast Regional Office's Fisheries Management Division and Statistics Division were also present. The representatives made presentations of their ongoing and proposed surveys, assessment activities, and related research. Additional workshops to emphasize standardization of inshore and estuarine sampling gear and cooperative tagging studies were tentatively scheduled for later in the year.

Darryl Christensen and John Clifford completed an informal report on Atlantic mackerel age sampling from the spring 1979 fishing season. They also finished work on determining the proportion of species caught by various methods during the 1975-77 survey of New Jersey party and charter boats.

Wally Morse revised and completed a program to apply probit analysis to maturity observations. He also verified approximately 10 000 observations of keypunched maturity data from the fall bottom trawl survey.

Fishery Assessment Investigation

Members of this investigation continued routine work on assessments of a number of species.

Ralph Mayo discussed sampling requirements with foreign fisheries observers at their annual workshop. Ralph also participated in the IYABA meeting to discuss plans for its spring research workshop.

Anne Lange prepared a reference document describing the separation of two species of Loligo squid which are taken in the bottom trawl survey. She also continued work on the age and growth of L. pealei and Illex illecebrosus, the two commercially important squid species in the Northwest Atlantic, and is developing a yield model for these stocks. Anne has continued work with the NMFS International Negotiations Division regarding US-Canadian boundary negotiations. Anne also reviewed a manuscript on squid predation resulting from the Multi-Species Fisheries Management Workshop.

Emma Henderson spent the month refereeing papers, working on manuscripts, and planning a course on assessment models.

Harold Foster completed a final draft of a NOAA Technical Report on recreational Atlantic cod catches, and prepared coastline plots for 22 species in the Middle Atlantic Bight.

Margaret McBride prepared a report on the current status of the yellowtail flounder fishery for the Northeast Regional Director.

Joan Palmer represented NMFS at the University of Maryland Eastern Shore as a member of the National Alliance of Business, Youth Motivation Task Force.

Louis Kerr prepared a package of recent assessment documents to be sent to Dr. Caddy of the United Nations Food and Agriculture Organization (FAO) in Rome. He also assisted Anne Lange in preparation of data files for squid length-frequency analyses.

Kathi Rodrigues has been collating squid length and catch data from the foreign fishery observer data logs, to be compiled into a data file for length-frequency analyses. She has also been processing 1979 frozen squid samples.

Ron Essig reviewed a manuscript which was submitted for publication in the Fishery Bulletin.

Senior Assessment Scientists

Brad Brown concentrated on organizational responsibilities to adjust to making full use of the returning talents of Vaughn Anthony. An attempt will be made to orient most of the assessment activities on a geographic basis as a second order as well as of course keeping up with our independent species responsibilities. These area designations should facilitate cooperation with the research needed for the Northeast Fishery Management Task Force. A Biostatistics Unit was established in addition, staffed by Joan Palmer, Harold Foster, and a student temporary employee.

Mike Sissenwine revised manuscripts from the multispecies fisheries management meeting held recently at St. Johns, NF. Mike was also involved with representatives from the State of Rhode Island in planning and implementing a yellowtail flounder survey of Southern New England. This survey is sponsored by NMFS, the New England Fishery Management Council (NEFMC), the State of Rhode Island, and Point Judith (RI) and New Bedford (MA) fishing industry associations. He also continued work with the Northeast Fisheries Management Task Force.

Fred Serchuk began preparation of an assessment report summarizing the status of the Georges Bank and Gulf of Maine Atlantic cod populations. He also analyzed the results of Atlantic cod catches in the autumn 1979 bottom trawl survey. Fred also continued work with the Groundfish and Sea Scallop Oversight Committees of the NEFMC. Three undergraduates from Smith College, participating in the January Internship Program, were supervised by Fred between 3 and 18 January. Fred reviewed manuscripts for Sea Grant funding and a manuscript submitted for publication in Marine Environmental Research.

Emory Anderson continued work with the MAFMC Scientific and Statistical (S&S) Committee. Emory also met with Jack Casey and John Hoey at the Narragansett Laboratory to discuss a draft paper, analyzing large shark catch data in the US Fishery Conservation Zone (FCZ). He also worked on red hake, bluefish, and large shark assessments.

Steve Clark worked with Thurston Burns and other members of the NEFMC Lobster Plan Development Team on the offshore lobster assessment. Steve and Ron Essig also worked on the 1980 haddock assessment.

Meetings, Talks, Visitors, and Publicity

Several members of the division staff participated in the January clam cruise, though problems with gear cut down the length of the first leg of this cruise. Frank Almeida, Liz Bevacqua, Steve Murawski, Louis Kerr, and Ron Essig departed on 2 January and returned on the 6th. The second leg was not able to depart until the 22nd, but the gear was functional for the remainder of that leg (22-30 January). Steve Murawski, Kathi Rodrigues, and Lou Kerr participated on this latter leg.

On 3 January, Ralph Mayo met with foreign fisheries observers at the Woods Hole Laboratory to discuss sampling requirements. Anne Lange demonstrated dissection of squid for sex and maturity indexes to several observers.

During 3-4 January, Mike Sissenwine attended a meeting of the Northeast Fisheries Management Task Force Steering Committee in Philadelphia, PA.

On 4 January, Brad Brown, Emory Anderson, and Stuart Wilk attended a meeting of the MAFMC S&S Committee in Philadelphia, PA. Brad discussed the situation relative to summer flounder research and NMFS State-Federal Program's Summer Flounder S&S Committee.

During 7-8 January, Mike Sissenwine and Stuart Wilk participated in the NMFS State-Federal Program's Summer Flounder S&S Committee meeting in Norfolk, VA.

On 7 January, Gordon Waring attended a meeting of the New England Fishery Development Program in Boston, MA.

On 10 January, Brad Brown attended the Center Promotion Committee meeting. Mike Sissenwine also attended this meeting as an Equal Employment Opportunity Program (EEO) observer.

On 11 January, Fred Serchuk attended the National Shellfisheries Association (NSA)/Shellfish Institute of North America (SINA) Program Committee meeting in Hyannis, MA.

On 14 January, Mike Sissenwine met at the Woods Hole Laboratory with scientists from the State of Rhode Island to discuss a yellowtail flounder survey.

Darryl Christensen attended a planning session of the Northeast Pollution Monitoring and Research (NEPMAR) Committee with representatives from NEFC (Ocean Pulse), NOS (Ocean Dumping), and the NOAA Environmental Research Laboratories' Marine Ecosystems Analysis Program's (MESA) New York Bight Project, at the Sandy Hook Laboratory on 15 January.

On 15 January, Mike Sissenwine presented a talk at the Woods Hole Laboratory on "A Brief History and Current Status of New England Fisheries" to students from Colgate University in Woods Hole. Fred Serchuk attended the NEFMC's Groundfish Oversight Committee meeting, in Peabody, MA. Harold Foster attended a Center EEO Committee meeting.

During 15-16 January, Ambrose Jearld participated in meetings and a site visit to a proposed study area in the Upper Appomattox River Watershed with faculty members and students from Hampton Institute, graduate students from Virginia Institute of Marine Science (VIMS) and the College of William and Mary, and scientists from the US Soil Conservation Service in Virginia. During that visit, Ambrose conferred with members of the faculty and administration of Hampton Institute concerning the development of a marine science program at that institution.

On 16 January, Fred Serchuk attended the NEFMC's Sea Scallop Oversight Committee meeting and the Council's monthly meeting in Danvers, MA. Brad Brown, Mike Sissenwine, and Ralph Mayo met with Mary Digiulian and Norris Jeffries of the NOAA team reviewing the NMFS Foreign Fisheries Observer Program.

On 17 January, Emory Anderson and Anne Lange met with Norris Jeffries to discuss the NMFS Foreign Fisheries Observer Program.

On 21 January, Fred Serchuk participated in the EEO Training and Promotion Subcommittee meeting at the Woods Hole Laboratory.

Frank Almeida and Thurston Burns participated in an experimental silver hake tagging project during 21-22 January. They worked aboard the NOAA R/V Kyma out of Sandy Hook, NJ, using hooks and line, in the vicinity of Ambrose Light. A total of 44 silver hake was tagged.

During 21-25 January, Brad Brown attended the Ocean Acoustics Research Workshop in Seattle, WA, and participated in preparation of the fisheries documentation for future research in this area.

On 22 January, Ralph Mayo attended an IYABA meeting at the Narragansett Laboratory to discuss plans for its spring research meeting to be held in Woods Hole.

During 23-24 January, Mike Sissenwine, Emory Anderson, Fred Serchuk, Stuart Wilk, Ambrose Jearld, Jr., Darryl Christensen, Wallace Morse, Frank Almeida, Gordon Waring, Henry Jensen, and Thurston Burns attended the Mid-Atlantic State-Federal Assessment Workshop in Sandy Hook, NJ.

On 25 January, Ralph Mayo attended a meeting of the Executive Board of the Southern New England Chapter of the American Fisheries Society to plan the 1980 spring meeting to be held at the New England Aquarium on 18 June.

During 27-29 January, Joan Palmer represented NMFS at the National Alliance of Business, Youth Motivation Workshop, at the University of Maryland Eastern Shore.

During 28-31 January, Brad Brown attended the NMFS-State Fishery Directors meeting in Washington, DC, and participated in discussions relevant to developing more effective generalized NOAA-State cooperative programs in fisheries management and research.

On 28 January, Mike Sissenwine met with Woody Chamberlin of the Atlantic Environmental Group (AEG) to discuss further joint work on yellowtail flounder.

On 29 January, Mike Sissenwine attended the Center EEO meeting at the Narragansett Laboratory. Emory Anderson met with Jack Casey and John Hoey at the Narragansett Laboratory to discuss a draft paper analyzing large shark catch data in the FCZ.

Publications

Wilk, S. J.; Smith, W. G.; Ralph, D. E., Sibunka, J. The population structure of summer flounder between New York and Florida based on linear discriminant analysis. Trans. Am. Fish. Soc. (A)

Reports

Clifford, W. J.; Christensen, D. J. Age composition of the 1979 spring recreational catch of Atlantic mackerel, Scomber scombrus, in the Middle Atlantic region. Sandy Hook Lab. Rep. No. SHL 80-01;1980. 7 p.

Lange, A. M. T. Yield per recruit analysis for squid, Loligo pealei and Illex illecebrosus. Woods Hole Lab. Ref. Doc. No. 80-03;1980.

Lange, A. M. T. Species separation of Loligo squid (L. pealei and L. plei) during NMFS bottom trawl surveys. Woods Hole Lab. Ref. Doc. No. 80-04; 1980.

MANNED UNDERSEA RESEARCH AND TECHNOLOGY PROGRAM

No report received. The December and January reports will be included in the February issue.

MARINE ECOSYSTEMS DIVISION

Ecosystem Dynamics Investigation

Marv Grosslein revised the paper on the Georges Bank energy budget prior to distribution to reviewers. Georges Bank appears to be more productive than the North Sea at all trophic levels except for the pelagic fish component. Given the same trophic structure in the two areas, pelagic fish production per unit area on Georges Bank would have to be increased by a factor of five to bring it in line with the North Sea. Our estimates of pelagic fish production on Georges Bank are probably conservative, but such a margin of error is very unlikely. This poses significant questions about the basic assumptions underlying our estimates of energy cycling and ecological efficiencies in a marine ecosystem, and it also raises the possibility of significant advective losses of plankton production on Georges Bank.

Mike Pennington continued his presentation of statistics lectures at both the Woods Hole and Sandy Hook Laboratories, and he also spent several days consulting on statistical problems with NEFC staff at the Sandy Hook Laboratory. Wendell Hahm attended a meeting at the Brookhaven National Laboratories in Upton, NY, with other members of the Marine Ecosystem Division to discuss carbon budgets on the continental shelf. Wendell, Marv Grosslein, and Rich Langton conferred with Ted and Ann Durbin at the University of Rhode Island (URI) on methods of estimating daily rations of fish. Wendell continued evaluation of analytical methods for GEORGE, focusing this month on flow analysis as applied to ecological systems, and he also worked on quality control of the fish food habits data base. Brian Hayden nearly brought to completion his work on the construction and editing of the zooplankton computer file for the larval Atlantic herring cruises upon which Roz Cohen is working.

Recruitment Processes

Greg Lough and Red Wright completed a detailed report on the larval Atlantic herring patch study meeting held at the Bedford Institute of Oceanography during 10-12 December 1979. Up to 15 possible papers and probable authors were identified from the US and Canadian data in three general areas. Twenty-two reports already have resulted from the patch study. Greg Lough also drafted a sailing order for Albatross IV Cruise No. AL 80-02 during 31 March-10 April to study larval fish trophodynamics, prepared a new position description for Tom Morris who has been transferred to Recruitment Processes, and wrote a proposal (with Marv Grosslein) on the possible application of ocean acoustic remote sensing (OARS) studies by the NEFC for a workshop this month in Seattle, WA.

Roz Cohen spent most of the month working on the statistical analysis of the zooplankton data from the 1974-75 and 1975-76 ICNAF (International Commission for the Northwest Atlantic Fisheries) larval Atlantic herring cruises, and completing a paper and a poster on this material for the American Society of Limnology and Oceanography (ASLO) meeting in Los Angeles. She continued working with Brian Hayden on the programming of the 0.333-mm mesh zooplankton data for the larval Atlantic herring prey selection study. Additional time was spent training Tom Morris, Bill Hess, and Victoria Massard in the identification of zooplankton. A student volunteer,

Lisa Chapman of Colgate University, assisted William Michaels with the chaetognath patch project for 1 wk. William Michaels, a University of Massachusetts co-op student, completed an analysis of the four MOCNESS (multiple opening-closing net and environmental sensing system) hauls in the chaetognath patch for his special project and returned to school on 25 January. His co-op student replacement, Ira Palmer, reported on 14 January. Ira is a biological oceanography undergraduate from the University of the District of Columbia.

We received the final 0.333-mm-mesh ichthyoplankton cruise data summary from the Narragansett Laboratory to complete our study of the ICNAF larval Atlantic herring data. George Bolz has attempted to sort out some major discrepancies between 0.333-mm and 0.505-mm-mesh ichthyoplankton data summaries. He has now completed data tabulation of all ichthyoplankton collected within the 100-m depth contour on Georges Bank and Nantucket Shoals from all the ICNAF larval Atlantic herring cruises during the 1971-76 seasons, and has started to summarize the data.

Dave Potter has completed the comparative analysis of the Albatross IV Cruise No. AL 74-13 for bongo and neuston net ichthyoplankton catches. Two more cruises still need to be analyzed before a manuscript can be completed. He wrote NEFC's "Energy Newsletter(No. 4)" on indirect solar energy collector systems and, at the request of Herb Stern, spent several days reviewing guidelines for possible NEFC participation in a US Department of Energy (USDOE) proposal. In subsequent meetings with representatives from other laboratories, it was decided that each laboratory should submit their own proposal. Dave is in charge of the Woods Hole Laboratory proposal and has spent 2 wk on it so far.

Hal Merry, electronics technician, has spent the month working on various components of the MOCNESS system to increase our real-time analytical capability. He also assisted in the preparation of the electronic clam dredge for the upcoming surveys. Roz Cohen and George Bolz attended one Center EEO Committee meeting; George Bolz, one Promotion Subcommittee meeting; and Roz Cohen, two Federal Women's Program (FWP) meetings. Robert Livingstone is working on a comparison of research versus commercial-sample fecundity estimates for Georges Bank haddock.

Fishery Oceanography Investigation

Red Wright, Steve Ramp, and Derek Sutton prepared for a cruise on the tug Whitefoot to repair lights at the N1 and N3 marker buoys on the Nantucket Shoals flux experiment line. Red and Derek will participate in the cruise. Gil Dering and Tom Laughton began post-cruise preparations on nine vector-averaging current meter (VACM) cages and rotors. They have also been designing a hydro-wire instrument system which includes wire metering with phototransistors, infrared emitters, and +/- count with a rate and wire angle display. The existing meter block system was also repaired. Timothy Cain, Sam Nickerson, and Derek Sutton began cruise preparation for an Albatross IV MARMAP (marine resources monitoring, assessment, and prediction) cruise. Timothy did a maintenance check on the 1.7-liter Niskin bottles. He also ordered six new 2.5-liter Niskins to expand the water sampling capability. Derek prepared the Winkler dissolved oxygen system while Sam prepared all hydrographic logs.

Steve has spent considerable amounts of time trying to move three outside data sets into a new format compatible with our current meters, which would allow intercomparison. The three data sets are: (1) Canadian current meter data from the patch study; (2) wind data from the NOAA "master buoy" on Georges Bank; and (3) wind data from Fleet Numerical Weather Central in Monterey, CA. He also researched potential safety hazards involving lithium batteries in oceanographic instruments. Derek was

involved with weather comparisons, Bakun-computed wind speeds versus those read from charts for the Northeast Channel. He also contoured oceanographic sections for the Nantucket Shoals flux experiment. Sam has read temperatures and made contour plots of the following cruises: Soviet R/V Belogorsk Cruise No. 79-04, Polish R/V Wieczno Cruises No's. 79-03 and 78-04, and Albatross IV Cruise No. AL 79-13. Tim began compiling data for the annual Ship of Opportunity Program (SOOP) report to be issued in late March. Dan Patanjo has been involved with collecting MARMAP data for publication from all MARMAP cruises in 1977 and 1978. He has also collected National Oceanographic Data Center (NODC) data and has stored them on the Sigma 7 system.

Red, accompanied by Wendell Hahm, went to Brookhaven National Laboratories on 8 January for discussion of current research and possible future joint work. On 23 January, he met with Tom Aldrich of US Geological Survey (USGS), Don Moller of the Woods Hole Oceanographic Institution (WHOI), and Commander David Pepple of the US Coast Guard (USCG) First District headquarters in Boston to discuss possible cooperation between USCG and the Woods Hole scientific community. On 24 January, he met with Jon Gibson and Fred Nichy to discuss NEFC participation in the Falmouth High School Science Fair.

Ron Schlitz prepared a paper for presentation to the International Decade of Ocean Exploration (IDOE) International Symposium on Coastal Upwelling. The title of the paper is, "Evidence of Upwelling at the Northern Edge of Georges Bank."

Several individuals have joined our investigation. One is Arthur Allen (master of science in oceanography from Dalhousie University in Halifax, NS) who was a member of the investigation 5 yr ago and is preparing a patch study data inventory. Another is Bruce Davis, recently with Peter Wiebe at WHOI, who is a graduate of Southhampton College, Long Island, and is in the process of drawing MARMAP sections.

Ron Kirschner has taken a 5-mo leave of absence to study biology in New York City.

Ichthyoplankton Investigation

Although this is the first month in the past year that we have not been involved in field work, there has been no relief in field-related duties. John Sibunka and Bill Brennan spent most of the month getting overused equipment ready for a full schedule of late winter and spring cruises. Laboratory work centered around yellowtail flounder, Atlantic cod, haddock, sand lance, and implications in annual variations in distribution and abundance of ichthyoplankton in shelf waters from Cape Hatteras to the Gulf of Maine. The dramatic increase in abundance of sand lance continued in 1979. Abundance estimates were 17% greater than 1978 estimates and 17 times greater than in 1974 when our series began. Larval fish representing 170 taxa occur off our Middle Atlantic and Northeast Coast. Since 1977 sand lance larvae have constituted more than 90% of the winter ichthyoplankton community. In 1978 they accounted for nearly 40% of all larvae that occurred in the 260 000 km^2 survey area.

Wally Smith is in Poland for 2 wk working with the staff at the Plankton Sorting Center in Szczecin. While there, he will work closely with Marak Baranowski to review pertinent literature and design specific methods for investigating the taxonomic status of sand lance. This work will include detailed studies of larvae, postlarvae, juveniles, and adults from shelf waters off the East Coast.

The BLM report summarizing ichthyoplankton data collected in the Middle Atlantic Bight from 1965 to 1976 has been approved by BLM. Finally, Bill Brennan resigned to join NOS as a technician on Albatross IV. We will miss him.

Plankton Ecology Investigation

Work is continuing on estimating residence times and transport of ichthyoplankton on Georges Bank on the basis of near-surface Lagrangian circulation data obtained from satellite-monitored current-drogue studies conducted by Raytheon Ocean Systems Co. and E. G. and G. Environmental Consultants for the BLM under the New England Outer Continental Shelf Physical Oceanography Program. To date, cubic-spline-fitted drogue tracks for four experiments undertaken during December 1978 and March, May, and August 1979 have been plotted and work is now directed at summarizing ichthyoplankton distributions during these time periods.

During the past month, Robert Marak, who is serving as chief scientist of a joint Gulf and Atlantic shelf survey (GAS I), made preparations for the cooperative cruise between NEFC and SEFC to sample fish and invertebrates for analysis of petroleum hydrocarbons and in fish flesh and to obtain sea-truth data for the calibration of the coastal zone color scanner. A number of discussions and meetings were held before this cruise.

Image Analysis

Activities in the Image Analysis Project of the Narragansett Laboratory during the first quarter of 1980 will focus on the timing of biological events on Georges Bank during the spring. The size frequency of the dominant species will be measured from pre-sorted, 0.333-mm-mesh bongo samples. The purpose of this study is to evaluate the performance of the image analysis system in routine zooplankton processing operations through a stepwise comparison of manual processing to electronic processing. Using the image analysis system, the size frequency of the dominant species from a total of 170 samples taken on spring cruises from Georges Bank in 1977, 1978, and 1979 will be measured. Bill Feltch of Suffolk University and Bryan Shelly of Colgate University have been assigned responsibilities and have begun to process 1977 and 1978 samples which were pre-sorted by Ruth Byron's group at the Narragansett Laboratory. Renata Lipska has been asked to time steps in the manual analysis of 10 samples from Albatross IV Cruise No. AL 79-03. The same samples will be processed with the image analysis system. This study will provide sufficient information for a publication documenting the image analysis methodology as applied to a research question.

Biostatistics

The imaging printer for receiving Global Orbiting Environmental Satellite (GOES) images, is now in the hands of the procurement office. This printer should be installed in an AEG trailer sometime in April and will allow reception of visible and infrared images produced by the National Environmental Satellite Service. Images such as seen on TV weather reports will be received, but the primary reception will be of infrared images enhanced to show ocean features such as eddies and fronts.

Data tapes, containing potentially sensitive data, have been received from the NEFMC. Password protection and other aspects of data management will be provided by the Biostatistics Unit. A revised data tracking file has been generated. It is now undergoing editing and updating. A report-writer module has been written and is being tested. The name parameter of the JOB CARD for job submittals under the EXQ1 account has been modified. The name parameter now contains fixed field information so that monthly billing reports can be sorted by cost center (AEG, IOCS, or BIO), by system component (EDITING, DATA BASE LOAD, DATA BASE ACCESS,

UTILITY, etc.), by individual user library, by individual run module, by data file accessed, by user initials, etc.

The URI Academic Computer Center is in the process of converting to a MVS system. When the conversion has stabilized, larger jobs will be handled at lower cost, turnaround time will decrease, system information will be more readily available, and a host of software improvements will be available. However, 2 wk of excessive down time, lost jobs, incorrect information, lack of disk space, etc., have wreaked havoc on our data processing capabilities. The outlook is for two-to-four more weeks of computer instability.

Revisions to URUNICHT, a program module which extracts ichthyoplankton information from the MARMAP Information System (MIS) master files and formats them ready for input to the Statistical Analysis System (SAS), have been implemented and documented. URUNICHT has been submitted to Input-Output Computer Services, Inc. (IOCS), for incorporation into the Data Base Management System (i.e., MIS).

Revisions to URUNFAGR, a program module which outputs Fager's Index of Affinity, is being revised to accommodate a greater number of stations and a greater number of taxa. We received a program from Scripps Institute of Oceanography for calculating recurrent group analysis. Statistics on relative efficiency of Georges Bank for fish production on an acre basis and rangeland for beef production (also on an acre basis) were examined. The information published in a Boston Globe article was found to be in error by many orders of magnitude. Data sets received included a tape of NODC-formatted hydrographic data for Albatross IV Cruise No. AL 78-07 from George Heimerdinger of the NODC in Woods Hole, and zooplankton data logs for West German R/V Anton Dohrn Cruise No. 78-03.

Data sets processed included station activity summaries of all cruises from September 1977 to present prepared for Jay O'Reilly. Tape of ichthyoplankton data extracted from the MIS was sent to Brian Hayden. Ichthyoplankton summaries (FISHSUM) and station activity summaries were produced by Chris Powell after a short training session. A master file for Delaware II Cruise No. DE 79-03 was generated. Zooplankton sampling logs (bongo and neuston net samples) for Delaware II Cruise No. DE 79-05 were edited, and zooplankton data for Soviet R/V Argus Cruise No. 78-04 were merged into the master file.

Marie Carter began a student appointment for 1040 hr. She is on a semester's leave from school and will be working full-time on program modification and documentation.

Donna Busch continued coordination efforts for joint work between the NEFC and the Polish Sea Fisheries Institute (MIR) in Gdynia. She spent considerable time locating chlorophyll-a, nutrient, primary productivity, temperature, and salinity data sets (1975-76) to be sent to the USSR as part of the US-USSR joint research program. She (with Jay O'Reilly) compared ^{14}C techniques with Paul Falkowski of Brookhaven National Laboratories in preparation of an International Council for the Exploration of the Sea (ICES) working group meeting on ^{14}C primary productivity methods to be held in summer 1980, and worked on ^{14}C print-outs for a data report to be issued in the spring. Donna also assisted the Narragansett Laboratory Director with preparations for a workshop on underway water sampling to be held in February.

During the month, Carolyn Griswold helped to prepare briefing materials for Ken Sherman's "day in court" as a NOAA witness at the US Environmental Protection Agency's (USEPA) administrative hearing on the application of the Pittston Company of New York, Inc., to site an oil refinery at Eastport, ME. She attended Vaughn Anthony's testimony on 25 January and also attended Ken Sherman's on 31 January. On 23 January, Carolyn Griswold, Ruth Rehfus, and Allen Peterson--the Georges Bank Biological Task Force representative--met with Dick Cooper and his staff at the Woods Hole Laboratory to discuss Dick's work on Georges Bank and additional work

he would like to do which would provide more baseline (pre-exploration) information for that area. Subsequent to that meeting, Carolyn Griswold and Ruth Rehfus discussed coordination of NEFC activities to provide additional baseline information for the lease areas. On 25 January, Carolyn Griswold, past President, and Ralph Mayo, Secretary-Treasurer; met with other officers of the Southern New England Chapter of the American Fisheries Society at the New England Aquarium in Boston to discuss activities and committee assignments for the year.

Larval Physiology and Biochemistry Investigation

A study of the effect of temperature on growth and chemical composition of larval summer flounder was completed. Work on a nitrogen budget for summer flounder larvae continued. A new initiative involved measuring ammonia and primary amine excretion over 24-hr cycles. Adult winter flounder were collected and are undergoing hormone induction treatments to produce eggs. The feasibility of different light sources and spectra for use with the video tape "bugwatcher" system for quantifying and analyzing larval swimming and feeding behavior is being explored. Cooperation with Hunt Howell of URI was initiated. His work on embryological development of yellowtail flounder will be integrated with our work in a joint manuscript on temperature-salinity effects on survival rates.

Geoff Laurence attended meetings at the Brookhaven National Laboratories to discuss joint NEFC-Brookhaven research and at the Sandy Hook Laboratory to discuss process-oriented larval dynamic research and planning with Marine Ecosystem Division personnel. Geoff and Larry Buckley attended a meeting with USEPA managers and scientists to discuss joint research related to Ocean Pulse initiatives.

Benthic Dynamics Investigation

Dr. Roland Wigley retired from federal service on 31 January. A good deal of time this month was taken up in preparing for Wigley's retirement to ensure continuity within the investigation.

A manuscript describing the distribution of bivalve mollusks is currently in the final phase of being typed. A group of distribution charts are now in a camera-ready state and another group of figures is being prepared. Roger Theroux submitted an abstract of a paper on "Photographic Systems Utilized in the Study of Sea-Bottom Populations," to be presented at the Symposium on the Scientific and Engineering Applications of Underwater Photography to be held in Woods Hole in April.

Aquarium studies on the digestion rate of winter flounder were initiated and the initial results are quite variable but encouraging. Problems were encountered in controlling the temperature of the incoming seawater, but this is being rectified. It appears that winter flounder do not eat when the temperature drops below 4°C, but are quite active feeders at slightly higher (5°-6°C) temperatures. Preparations have also been made for collecting live yellowtail flounder during Wieczno Cruise No. 80-01. If the collection is successful, experiments on these animals will be initiated in February and March.

Progress has been made on investigations of various aspects of the food of a number of different fish species. Ray Bowman has prepared a report on "Silver Hake (Merluccius bilinearis) Regulatory Influences on the Fishes of the Northwest Atlanti to be presented at the upcoming IYABA meeting. Ray is also revising a paper on the food of 10 juvenile fish to be submitted for publication, and he and Ed Bowman are revising a manuscript on the feeding chronology and catchability of silver hake. Progress is also being made on coding the data in the 1977-80 data base and on the

analyses of stomachs collected on a joint US-Canadian cruise as part of the 1978 larval Atlantic herring patch study.

Apex Predators Investigation

January was spent preparing our newsletter, The Shark Tagger. This winter's edition is our annual report to cooperative taggers. We have been using this newsletter as a progress report and to distribute educational material on sharks for several years. Three thousand newsletters will be completed and mailed in late March or early April. Preparations are underway for our spring research cruise aboard the Wieczno. We hope to concentrate on reproduction and food habits of large pelagic sharks south of Cape Hatteras. This cruise also allows us to conduct tagging studies during a time when several species of sharks and other apex predators begin their northward migration. Repairs to much of our "at-sea" hardware are being made by Wes Pratt and Chuck Stillwell with help from the Woods Hole Laboratory maintenance crew.

Several interesting tag recaptures were received in January. A swordfish tagged 76 mi NNE of Cape Hatteras was caught off Ft. Lauderdale, FL, (743 mi in 15 mo). This is the first direct evidence of southerly movements of swordfish between the Mid-Atlantic Bight and the Straits of Florida. A mako shark tagged in August, 25 mi off Atlantic City, NJ, was recaptured by a Japanese longliner in the edge of the Gulf Stream, 619 mi E of the tagging site after 57 days. Two sandbar sharks and one sandtiger shark tagged during the same week at Corpus Christi, TX, were all recaptured 494 mi S off Veracruz, Mexico. Chuck Stillwell and Nancy Kohler have prepared the first draft of a paper on "Food and Feeding Habits of the Shortfin Mako (Isurus oxyrinchus) in the Northwest Atlantic."

Jack Casey appeared on ABC-TV's "Good Morning America" show on 31 January with underwater cinematographer Stan Waterman to discuss the sonic tracking experiment on a white shark conducted with Frank Carey of WHOI. That experiment was filmed by ABC-TV to be shown on the "American Sportsman" series on 2 February. We have begun cooperative food studies on sharks with the staff of the New England Aquarium (NEA). Initially, an attempt will be made to measure evacuation rates of sandbar sharks by observing the passage of squid beaks through selected sharks. Greg Early, an NEA biologist, ceased feeding squid in the large aquarium tank on 15 January. The first feeding trials with squid will begin next month.

Meetings, Talks, Visitors, and Publicity

On 8 January, Ken Sherman, Jack Green, Donna Busch, Geoff Laurence, Wally Smith, Red Wright, and Wendell Hahm met with John Walsh and staff at the Brookhaven National Laboratories to review work in progress at both Brookhaven and NEFC.

On 17 January, Jay O'Reilly, Donna Busch, Ron Schlitz, Steve Ramp, Jack Colton, and Jack Green met with Ken Sherman to review progress on nutrient, chlorophyll, primary productivity, and current meter studies within the Marine Ecosystems and Environmental Assessment Divisions.

On 21 January, Bob Marak, Peggy Lamoureux, Tom Halavik, Jack Green, Ray Maurer, Donna Busch, Reed Armstrong, Tom Caldwell, and Bill Cheesman met with Ann Moffitt from White Fuel Co. to discuss plans for a proposal for solar modifications at the Narragansett Laboratory. The proposal will be submitted to the USDOE in February. Plans include the installation of solar collectors for heating hot water as well as the addition of a solar greenhouse.

On 22 January, Donna Busch and Reed Armstrong hosted an IYABA meeting at Narragansett.

Publications

Griswold, C. A.; Prezioso, J. In situ observations on reproductive behavior of the long-finned squid, Loligo pealei. Fish. Bull., US. (A)

Schlitz, R. Evidence of upwelling at the northern edge of Georges Bank. Paper for presentation to the International Symposium on Coastal Upwelling. International Decade of Ocean Exploration Program. (S)

Reports

Nickerson, S. R.; Wright, W. R. Spring and fall bottom temperatures on the continental shelf, Cape Hatteras to Cape Sable, 1972 to 1979 with surface temperature and salinity for 1978 and 1979. Woods Hole Lab. Ref. Doc. No. 80-01;1980.

RESOURCE UTILIZATION DIVISION

Fisheries Engineering Investigation

John Kenney has been conducting hydrodynamic studies of an Isaacs-Kidd midwater trawl aboard the Rorqual. Some instrumentation modifications are being performed, and onboard work will continue as weather permits. Instrumentation includes underwater TV, warp tension meters, warp angle indicators at both the boat and the gear, and bridle and depressor inclinometers.

Vern Nulk participated in the first part of the clam cruise. He instructed the crew in the proper procedures for handling gear.

Work is continuing on the design of a more selective scallop drag and on the redesign of the upper ramp for the clam dredge handling system.

Jack Moakley is developing a routine maintenance program for the Rorqual.

Al Blott is preparing a gear and safety lecture for the New England Fisheries Steering Committee Safety Seminar in Gloucester. Cost estimates for Danish beam trawls have been requested from Apeldoorn net works, and illustrations and text were provided for the NEFC's annual report.

Facilities Engineering

A preliminary layout for the proposed chemical waste storage building at the Gloucester Laboratory was completed, and the energy survey is continuing with emphasis on heat loss and how wall insulation would influence energy use. Repairs and improvements on the main heating system have been completed, and an air filtering device for the air control system has been added.

A solar heating and wind generating proposal is being prepared for the USDOE's Solar in Federal Buildings Demonstration Program.

Resource Development and Improvement Investigation

Blue Crab

After 1 mo of frozen storage followed by 1 mo of refrigerated storage, roller-extracted meats were of good quality and showed no significant differences from similarly treated commercially picked meats.

After 2 mo of storage at 33°-35°F (1°-2°C), the quality of pasteurized steam- and alginate-formed lumpmeats made from roller-extracted blue crab meat was good and not significantly different from the pasteurized control sample.

The results of research on blue crab during 1979 will be presented to the National Blue Crab Industry Association on 2 February 1980.

New Product Development

After 4 mo, samples of frozen Atlantic cod fillets stored at +5°, 0°, -5°, and -20°F were judged as Grade A in the raw state. However, upon cooking, the sample stored at +5°F was judged as borderline to fair. The color measurements changed very little, but the texture stress values increased somewhat. It was most noticeable in the sample stored at +5°F.

The fish sticks made from washed minced fish collected from frames, with added soy isolate, were given to the US Army's Natick (MA) Laboratory for evaluation. Preliminary results show that their evaluation of the sticks is in agreement with the results found at the Gloucester Laboratory, that the sticks are barely acceptable.

Seafood Composition

Work continues on evaluation of the lipid fractions of cod liver oil using thin-layer and gas chromatography.

Proximate compositions of fish block samples for the Product Quality, Safety, and Standards Investigation were completed.

Surf clams that were stored at the Marine Science Institute in Nahant, MA, for depurating were picked up for sensory testing and proximate analyses. Preference sensory testing was used to compare surf clams against commercial cherrystones (steamed) and soft-shell clams (fried). Samples were frozen in the shell for a long-term storage study.

Product Quality, Safety, and Standards Investigation

Product Quality

Frozen bluefish fillets were rated good in flavor and texture after 70 wk of storage at 0°F. Although chemical tests (TBA number and peroxide value) indicated the vacuum-packed samples to be less rancid than air-packed samples, the taste panel did not make this differentiation. Some dehydration was evident on the air-packed (polyethylene) sample, but not on the vacuum-packed (nylon) sample.

The time-temperature tolerance study for frozen red hake fillets (blocks) has passed the seventh week. The major quality change occurring is a textural toughening, and this is showing up dramatically in samples stored at +10°F. At the other storage temperatures (+5° to -80°F), the textural change has been to a lesser degree and commensurate with the temperature. The organoleptic texture scores are correlating with values of dimethylamine content, formaldehyde content, percent extractable protein nitrogen, and shear force measured by the Instron apparatus.

Mike Allsup has been separating mixtures of chemical waste collected in the lab over a period of time and is cataloging the different fractions in preparation for pickup and disposal by a reputable organization.

A statistical evaluation was performed on the data from the study in which the Torrymeter was tested for its use in measuring quality of salted Atlantic herring stored in seawater. A report will be written and submitted to the Maine Sardine Council because of its interest in the study.

Mr. Todd DeGarmo, a senior biology major at Colgate University, spent 3 wk at the Gloucester Laboratory under Ron Lundstrom's supervision as part of Colgate's Career Exploration Program. As part of Todd's project, he learned three techniques for biochemical species identification and used them to compare sarcoplasmic protein variations in goosefish. As we expected, the Association of Official Analytical Chemists (AOAC) methods for fish species identification based on cellulose acetate and "disc" electrophoresis also show variable sarcoplasmic protein patterns for goosefish. The variations were not as extensive as seen with isoelectric focusing, but were very distinctive. The reproduction of the variant patterns was not, however, nearly as good as with isoelectric focusing. The run-to-run variation was on the same order of magnitude as the goosefish protein variants.

Kurt Wilhelm spent a great deal of time entering data files on the computer from our completed work on "Addi-Fro," lysine, and tripolyphosphate treatments of minced whiting (silver hake), and with the data analysis.

We identified an unknown fillet of fish by AOAC-isoelectric focusing method as not being redfish for US Customs in San Francisco. The fish originated from Singapore, so it is something we have no standard pattern for, as yet.

Ron Lundstrom and Kate Wiggins visited Bruce Poole, President of Sea Plantations, Inc., to discuss algae utilization.

Two research proposals were reviewed at the request of the New England Fishery Development Program and the head of the Food Science Department at the University of Massachusetts.

Product Safety

A sample of striped bass edible tissue was fortified at the 0.1-ppm level with Aroclor 1254--a polychlorinated biphenyl (PCB). This spiked sample was replicated three times. It was worked up by the AOAC procedure with additional silica gel cleanup. Percent recoveries were as follows: Sample #1 - 84.1%, Sample #2 - 83.2%, and Sample #3 - 86.2%. Another sample of striped bass has been fortified at the 0.1-ppm level with Aroclor 1242. The samples have been worked up and will be analyzed next week.

Samples of juvenile striped bass received from the SWFC's Tiburon Laboratory were analyzed. Results on the total PCB content in edible tissues, liver, and gonads were reported to Dr. Whipple. A large shipment of samples will be arriving in February from the Tiburon Laboratory.

A request was sent to Dr. Uthe for our participation in an ICES intercalibration exercise on PCB's.

We forwarded a report on PCB analysis of 10 samples to John G. Reutter Associates, to whom we have contracted certain PCB analysis. Six of these 10 samples were worked up by the AOAC procedure at the Gloucester Laboratory. Additional cleanup of the extract was made by silica gel chromatography. Results of PCB analyses were compared. Our results were slightly lower than John G. Reutter Associates. This was based on our additional cleanup of the extract by silica gel chromatography to remove the analogues of DDT. Since the analogues of DDT elute at the same time as some of the PCB peaks, their total peak areas would be higher. Also, the computation by John G. Reutter Associates was based on Aroclor 1254. Our computation was based on a mixture of Aroclors 1242, 1254, and 1260. Every sample of fish tissue analyzed has been a mixture of two or more Aroclors.

Inquiries are being made to expand our Sigma Basic computer to a Sigma Basic 2. A RS-232C printed circuitry board with associated modem will permit us to connect to a large computer. A matrix algebra program may be necessary to process the large

amount of PCB data more accurately. Mixture of Aroclors in our first samples will necessitate writing more sophisticated programs to process post-run analyses.

Product Standardization

The proposed unified shrimp standard covering all forms of shrimp except breaded has been cleared by the NOAA General Counsel and will be published shortly in the Federal Register. Demonstrations on the use of the standard will be arranged at principal shrimp processing locations.

A draft of a proposed "Statement of Federal Food Standardization Document Management Policies and Abridged Procedures" was reviewed and comments submitted to the NMFS Seafood Quality and Inspection Division.

John Ryan attended the 10 January meeting of the Armed Forces Product Evaluation Committee at the US Army's Natick (MA) laboratory. He proposed the acceptance of rockfish species as suitable for procurement by the military. The committee accepted this recommendation and should be buying rockfish shortly.

A grading survey of products covered by the Codex proposed draft standards for fish blocks and for fish sticks and fish portions has been started. Six major producers of sticks and portions are participating in this examination of products.

A draft revision of the US standards for grades of frozen precooked fish portions was prepared and circulated. The purpose of this revision is to include puff batter and large-size breading granules as additional styles of product. We were fortunate to be able to use the Northeast Regional Officer's NBI word processor to prepare this draft.

We received an offer to supply shark (spiny dogfish) flesh and flesh from other underused species to the US Army's Natick (MA) laboratory as part of their study of comparative edibility of finfishes.

Proximate analysis by the analytical group was completed on raw and baked portions of Atlantic mackerel, pollock, and pollock with tripolyphosphate. The results were statistically analyzed. The work was done to determine if protein is lost as a result of cooking. As expected, there was no loss of protein.

Technical Assistance

Resource Utilization Division personnel provided information and technical assistance in the following areas: preparation of fillet blocks; history of fishing in Gloucester; eels; commercial lobster licenses; eel pout; aquaculture; how to apply for inclusion of locust bean gum and guar gum in the Codex proposed draft standard for fish blocks; fish net mesh size regulations in regard to obtaining larger, more valuable, fish; how to make kamaboko on a laboratory scale to study several aspects of New England fish for their suitability for export as surimi; condensed phosphates in fish emulsions such as "frankfurters;" AOAC protocol related to a proposed methodology to determine "net weight" of frozen shrimp; a parasite called Nybolineus surmenicola in Alaska pollock flesh; tolerances for parasites in flounder fillets; preparation of salt fish and its potential as an export item; vacuum and controlled-atmosphere packaging of fish for retail sale; suppliers of Maine shrimp (Pandalus borealis); US processors of fish blocks; squid harvesting, handling, and exporting from two different sources; design of a vessel heating system; design of chilled (CSW) and refrigerated seawater (RSW) holding systems; longline and tub-trawl; interaction of doors, drags, and dredges with the bottom; mid-water doors; net webbing measurement; kort nozzle, polyvalent, and MIT doors; fish traps and weirs; dragging and pair trawling; hold design for CSW; recipes for products made from minced fish; minced fish yields and

products from minced fish; equipment used in the mincing operation and ways to use minced fish; use of the ocean quahog in clam products; and seafood packages and packaging machines.

Meetings, Talks, Visitors, and Publicity

Judi Krzynowek attended the IYABA meeting in Narragansett, RI.

Judi and Kate Wiggin attended a Hewlett-Packard sponsored course on the 5880A gas chromatograph.

Joe Mendelsohn, Joe Licciardello, Fred King, and Mike Corbett participated in a review of Sea Grant projects at Cornell University. A preview and discussion of some of the proposed Sea Grant studies were also given. In some cases, especially in the marketing of minced fish products, the Cornell group is market testing products similar to the products we were trying to commercialize several years ago.

Don Gadbois attended a 1-day course at the Perkin-Elmer Corporation in Wellesley, MA, on programming the Sigma Basic computer. The course was designed to acquaint us with Sigma Basic interaction statements, language statements, directives, and system functions. It also consisted of hands-on lab work with heavy emphasis on writing Sigma Basic programs.

Perry Lane attended the monthly meeting of the New England Fisheries Steering Committee and a conference on fisheries investment sponsored by the committee. He also attended a meeting of the New England Marine Advisory Service's (NEMAS) Long-Range Planning Committee.

Publications

Licciardello, J. J.; Ravesi, E. M.; Allsup, M. G.; Brooker, J. R.; King, F. J. Frozen storage characteristics of mixed fillet-mince cod blocks. Lebensmittel-Wissenschaft und Technologie. 12:290-292;1979. (P)

DIVISION OF ENVIRONMENTAL ASSESSMENT (December and January)

Behavior of Marine Fishes and Invertebrates Investigation

December

Work, supported in part by USEPA funding, is continuing on the study of the behavior and ecological requirements of both post-larval and juvenile hakes (i.e., red hake, spotted hake, and white hake). Currently we are analyzing video tapes for day and night activity rhythms and feeding behavior recorded during the fishes' planktonic stage. Lab specimens were collected by means of a Haedrich net and immediately returned to the lab where they were held in specially designed aquaria and provided primarily with a natural copepod diet. Video recordings were made continually while the fish remained planktonic. Although the analysis is not yet completed, the post-larvae appear to be more active during the day than at night. Analysis of video tapes for behaviors associated with hakes' settlement from the plankton has just been initiated. Results from these analyses will be compared with those from studies currently in progress on the post-settlement behavior of juveniles.

January

Recent activities have centered on the design of a specialized testing facility for studying the effect of anoxic conditions on the behavior of various marine fish

species (e.g., juvenile bluefish, hake, tautog, cunner, winter flounder). Studies will concentrate at first on the comparative capabilities of these species to avoid potentially lethal conditions and thereby mitigate such effects.

The design of the facility incorporates individual component systems to control and/or monitor light intensity, photoperiod, temperature, water quality, and dissolved oxygen levels in a 1.5-kl experimental aquarium. While the use of component systems will provide the flexibility for modifying the facility to accommodate the different ecological requirements of each species, their integration will allow precise control of experimental variables. Materials and supplies have been ordered, and upon their receipt construction will begin.

Environmental Chemistry Investigation

December

Several members of this investigation participated in the December Ocean Pulse survey aboard the Delaware II (Cruise No. DE 79-11). Susan Barker and Barbara Lump, both volunteers, and Susan Craig measured netphytoplankton and nannophytoplankton chlorophyll-a concentrations at 51 Ocean Pulse stations. Chlorophyll data from Belogorsk Cruise No. 79-05 primary/secondary production survey were computerized and edited.

Jim Duggan examined 22 phytoplankton samples collected immediately off the seabed (using a bottom-trip Niskin bottle), and matching samples collected 3-4 m above the seabed during the fall Ocean Pulse survey (Albatross IV Cruise No. AL 79-10). We have noted particularly high chlorophyll concentrations adjacent to the seabed during summer and fall Ocean Pulse and MARMAP surveys of coastal water off New Jersey. Jim's special study so far has demonstrated that total phytoplankton cell densities were considerably higher adjacent to the seabed than densities observed 3-4 m above the seabed. Jim is preparing a paper on his findings to be presented at IYABA's 1980 NEFC research meeting at Woods Hole.

We made considerable progress in December in computerization and calculations of rates of primary production from several Ocean Pulse and MARMAP surveys. Some time was spent overhauling, repairing, and calibrating field equipment.

Al Matte, Ruth Waldhauer, and Andy Draxler prepared a data report on "Nutrient Data from the Cruise of the Whiting." The report presents distributional data in nutrient concentrations along transects near the Nantucket current-meter array.

January

In January, Chris Evans, Jim Duggan, and Sue Barker computerized, reduced, and contoured chlorophyll measurements made during recent fall and winter Ocean Pulse and MARMAP surveys (Belogorsk Cruise No. 79-05, Albatross IV Cruise No. AL 79-13, and Delaware II Cruise No. DE 79-11). All chlorophyll field equipment was overhauled for the upcoming spring MARMAP survey.

The distribution of chlorophyll-a in November-December 1979 on the shelf was similar to distributional patterns measured during these months in 1978 and 1977. The highest chlorophyll concentrations were observed at the center of Georges Bank (3.4 - 4.5 mg/m^3). Chlorophyll concentrations progressively decreased from the center to the periphery of Georges Bank. Chlorophyll-a concentrations in the Gulf of Maine ranged between 0.2 and 1.2 mg/m^3) and were slightly higher in 1979 than biomass values measured in 1977 and 1978.

Jay O'Reilly and Ralph Bruno spent a large portion of January computerizing and calculating rates of primary productivity measured during three Ocean Pulse and four MARMAP surveys made in 1979. We made considerable progress in editing primary productivity data from 1976 and 1977 so that all primary productivity data collected at the Sandy Hook Laboratory from 1973 to present can be archived in the Ocean Pulse information system. An improved $^{14}CO_2$ sparging apparatus was constructed and tested for use in shipboard measurements of rates of dissolved organic carbon release by phytoplankton during photosynthesis.

Vincent Zdanowicz assisted with preparations and sampling protocol for the extensive shelf-wide survey (GAS I) of hydrocarbons in fish and sediments which will take place aboard the Albatross IV in February. Vincent Zdanowicz and Jay O'Reilly continued to work closely with the maintenance department at the Sandy Hook Laboratory in the final stages of the construction of a clean heavy metals lab there.

Ruth Waldhauer and Al Matte completed analysis of inorganic nutrients in 550 seawater samples collected during recent Ocean Pulse and MARMAP surveys.

In January, we acquired surplus Auto Technician equipment (worth about $18 000) from the Veterans Administration (Lyons, NJ). Al Matte reconditioned this surplus equipment. We will use it as a backup for our existing automated nutrient analyzer. With this acquisition we will be able to automate our ammonium analyses.

Andy Draxler revised drafts of manuscripts dealing with distributions of nutrients in Lower Bay and sulfide distributions and impacts during the 1976 anoxia off the coast of New Jersey. Organic carbon analyses were completed for samples collected during an Ocean Pulse survey on Cape Fear Research Institute's R/V Advance II (Cruise No. 79-01). Experiments were also initiated to determine the efficiency of our methods for digesting and recovering dissolved organic carbon in seawater.

Al Matte, Ruth Waldhauer, and Chris Evans worked with members of the New Jersey Marine Sciences Consortium instructing them in NEFC's methods for collecting samples for nutrient and chlorophyll analyses. Assistance was also given in the design and acquisition of equipment to be used in the field for these collections.

Physiological Effects of Pollutant Stress Investigation

Anaerobic Bacteriology/Metabolism

December

Ocean Pulse activities during the month included the analysis of the top layer of bottom sediments from 22 stations (both legs) obtained from a recent Delaware II cruise. Total bacterial counts were observed to be lower than those obtained from an earlier cruise, showing perhaps among other things the influence of ambient temperature on the counts. Isolates have been obtained for characterization to determine any differences in species type during the colder months. Some differences were noted previously.

Two bacterial isolates, tentatively identified as NON-01 Vibrio cholerae (i.e., not the classic V. cholerae-01 which is most prevalent in India), were obtained from the top water from our Ocean Pulse stations on Long Island Sound. It should be noted that this organism was recently identified as the cause of food-poisoning outbreaks through the consumption of raw oysters in Florida.

January

Ocean Pulse activities during this month were directed to the biochemical characterizations of isolates obtained from samples on the Ocean Pulse (OP) Delaware II cruise. Species differences were noted from winter samples as compared to spring and summer samples.

In our last monthly report we reported on the isolation of two NON-01 Vibrio cholerae organisms from top waters of our Long Island Sound OP stations. Because of the significance of these results, 12 market oysters were also analyzed for the Vibrio group. Two additional NON-01 V. cholerae were obtained from two individual oysters plus one belonging to the Vibrio parahaeomolyticus group. In addition to biochemical characterization of the isolates, other physiological characters are being determined for further identification. The biochemical and antibiotic sensitivity of the four isolates are similar; however, the tolerance to sodium chloride for growth at temperature differs between the isolates depending upon their source, i.e., water or oyster.

After some additional studies we will send the organisms to the Public Health Service's Center for Disease Control for serological identification.

Biochemical Effects

December

Sea scallops exposed to 10 ppb cadmium (as the chloride) for 45 and for 60 days, or to 10 ppb silver (as the nitrate) for 30 days, were sampled for adductor muscle and gill tissue. The gill samples were homogenized after excision, and the preparations frozen-stored (-80°C) with the muscle samples to await testing.

Live sea scallops supplied by the Resource Surveys Investigation were variously treated (i.e., either exercised via 32±7 claps for 1 min, made hypoxic for 1.5 hr, or starved for 3 wk so that we could measure the effects of such natural stresses on our selected suite of energy-related enzymes in the adductor muscle. The muscle samples are stored at -80°C, and will be tested within the next month or two.

Analysis continued this month on our backlog of sea scallop adductor muscle from the July Ocean Pulse cruise (Albatross IV Cruise No. AL 79-07). Gill preparation from the silver exposure experiment was also analyzed. Work continued with octopine dehydrogenase (ODH); half of a scallop muscle preparation was put through a Sephadex column to remove small endogenous metabolites, and the "LDH" and ODH activities compared with the untreated preparation. Removal of the endogenous arginine also removed all "LDH" activity, confirming that what heretofore was regarded as "LDH" activity in scallop adductor muscle (pyruvate + NADH = lactate + NAD) is actually ODH [arginine + pyruvate + NADH = propionyl-arginine (or octopine) + NAD]. Fine-tuning of the pH optimum is under way.

The biochemistry group also participated in the December Ocean Pulse cruise (Delaware II Cruise No. DE 79-11).

January

Last of the current scallop-exposure experiments, the 60-day, 10-ppb silver exposure, was taken down this month, and all remaining animals were sampled for biochemical analysis (i.e., gills and adductor muscle), as well as for physiological testing and tissue metal-uptake analyses. We are focusing on this animal because of its importance as a monitoring species for Ocean Pulse, and because there has been

no similar experimentation, which is necessary for interpreting field observations, performed as yet with the sea scallop.

Gill-tissue preparations (made with the fresh gills, then frozen-stored at -80°C) for 30-, 45-, and 60-day cadmium exposures (also 10 ppb), as well as for the recently completed 60-day silver exposure, were completed and are presently being calculated. Data for gills from 30-day silver exposure, analyses completed last month, show no significant differences in glycolytic rates between control and exposed animals, an observation not necessarily at odds with the respiratory data for the 30-day animals, but one that stimulates further study.

Also analyzed were adductor muscle samples from scallops sampled during last summer's Ocean Pulse cruise. These show that the animals are back to normal from last fall's abnormally high glycolytic rates in specimens taken from the Baltimore Canyon site.

Physiological Effects

December

The Physiology Group was involved in both legs of the December Ocean Pulse cruise on the Delaware II. Although bad weather hampered operations on the first leg, many blood samples from both finfish and shellfish were taken. A considerable amount of lab time was spent analyzing blood samples collected from that cruise and from an earlier NOAA R/V Kelez Ocean Pulse cruise.

Sea scallops exposed to either cadmium or silver for up to 45 days were examined this month. Consistent with earlier findings on other bivalve mollusks, we found that cadmium depressed metabolic activity while silver greatly increased it.

We are in the process of winterizing the Brett Respirometer lab which will make working conditions in that are much more comfortable during the cold months ahead.

January

This month hematology data on windowpane (flounder) from three stations in Long Island Sound were analyzed for differences between stations and differences due to season. Several trends are apparent, including hematological differences between "clean" and "polluted" areas in the sound. These data indicate that an additional year of sampling is desirable to fill in gaps and add to the present data base.

A study designed to evaluate the use of the scanning electron microscope (SEM) as a biological monitoring tool in the Ocean Pulse Program was initiated this month. Recent reports have indicated that pollutant-induced changes in gill surfaces are detectable by SEM, and we will be studying selected mollusk, crustacean, and finfish gills over the next 6 mo in this program.

Our results from a cooperative study with the Biochemistry Subtask show that silver-exposed sea scallops exhibit a highly significant elevation in gill-tissue oxygen consumption as compared to controls. This is consistent with earlier data on effects of silver on marine animals.

Physioecology

December

Studies with slipper limpets exposed to silver continuously for the last 18 mo are continuing. Reproductive activity has subsided due to decreasing seawater temperatures in the test tanks.

A mini-diluter for exposing larval shellfish to heavy-metal pollutants was assembled. This diluter is now being debugged in anticipation of experimental exposures.

Work continued on the development of methodologies for PCB analysis. Tissue samples of certain selected fish are being analyzed for levels of PCB (as Aroclor 1254).

Several breakdowns in plumbing and equipment reduced the level of effort spent on heavy-metal analyses this month.

January

Work continued with the slipper limpet this reporting period. Egg sac production has ceased because of dropping seawater temperatures. Those egg masses produced before winter temperatures set in are maturing very slowly. Two F_1 control specimens released larvae which survived for only 2 wk. Some F_2 control larvae and F_3 10-ppb-exposed larvae have metamorphosed and are being readied for transfer to the diluter system.

The remainder of the month was spent working out problems with a mini-diluter and rebuilding a diluter with modifications that were observed while visiting the USEPA laboratory in Duluth, MN.

Studies with juvenile mussels exposed to silver and copper individually for the last 7 mo are continuing.

Adult mussels are now being conditioned for spawning experiments next month. Mussel embryos will be exposed to seven different metals individually for LC_{50} determinations.

Some developmental work was performed this month on the use of solvent-extraction techniques for the concentration of heavy metals from seawater to allow lower detection limits than currently attainable. The procedures available in the literature gave very poor recoveries in our hands and contrary to the reported values given in the literature. Further work is planned for next month.

Seawater samples from our heavy-metal exposure systems were monitored weekly.

Biological Oceanography of Stressed Ecosystems Investigation

December

Bill Phoel participated in the first leg of the December Ocean Pulse monitoring cruise aboard the Delaware II in the capacity of chief scientist. Stations were occupied by the Delaware II in the Gulf of Maine, on Georges Bank, and on the Long Island continental shelf.

Bill also refined his calculations of the amount of subsurface oil entering the Laguna Madre, TX, during the IXTOC I oil spill in the Gulf of Mexico. These calculations and associated data and observations were forwarded to the Hazardous Materials Response Project in Boulder, CO, for presentation at the project's January training session.

The algal bioassay/phytoplankton growth potential sampling scheme for the December Ocean Pulse cruise was expanded to 26 sites from the 14 for the September cruise. One or two more stations are under consideration and then it is expected that the sampling regime will be adequate for at least the first year. Samples on the December cruise were collected with the cooperation of Bill Phoel and Frank Steimle. The use of a 0.5-µm membrane filter in combination with a fiberglass prefilter for on-board sample filtration has apparently solved the filtration difficulty encountered on the September cruise. The labor-saving filter rig which has the filtrate flow

directly into the acid-cleaned plastic storage bottles is workable, although some partial bottle collapse has been experienced.

A paper was reviewed for the Journal of Phycology.

A recent paper by Paul Olsen and Myra Cohn (1979) is now out and reprints should be available from Myra in February. The paper, which deals with a year-round phytoplankton survey from 1975 through 1978 at estuarine and coastal locations in the New Jersey northern shore and Lower New York Bay, revealed 332 species representing nine classes of algae. Bacillariophyceae comprised 51% of this total; Dinophyceae, 28%; six other classes of phytoflagellates, 18%; and Chlorophyceae, 3%. Overall, seven species were considered seasonal dominants, while 63 others were relatively numerous. Of the 332 listed species, 208 are newly recorded from the plankton of this area.

Several quick scans were accomplished by Myra Cohn and Dr. Harold Marshall this past month on selected stations from cruises during September to December 1979. Note from the September cruise were elevated counts of the large diatom Coscinodiscus wailesii off Narragansett Bay and elevated counts of Ceratium spp. (e.g., C. lineatum and Prorocentrum micans at stations in the New York Bight. Surface stations in the eastern area of Georges Bank showed rather normal flora for that time of the year and no significant numbers of Coscinodiscus. For example, Dr. Harold Marshall of Old Dominion University reported to Mrs. Myra Cohn his findings of Guinardia flaccida, Prorocentrum micans, and Rhizosolenia spp. which corresponded with Mrs. Cohn's findings at these stations. A quick scan of some stations sampled in late November revealed slightly elevated counts of C. wailesii, Ceratium lineatum, and C. massiliense for stations off Montauk at the surface, and elevated counts of Prorocentrum micans and Ceratium spp. for stations off Cape Cod at the surface. These latter stations also had significantly elevated numbers (bloom concentrations) of Ceratium spp., Dinophysis spp., and P. micans.

During December, as well, normal activity of dissemination of samples to Dr. Harold Marshall and examination of routine samples for phytoplankton community composition continued.

A meeting was held at the facilities of the SWFC in La Jolla, CA, during 3-6 December 1979 to discuss special funding for the coastal zone color scanner (CZCS) program to conduct critical research prior to the inevitable failure of the CZCS now on the Nimbus-7. The rationale was to determine what research was necessary to: (1) protect our present investment in the CZCS data; (2) provide sea truth now so tha archived data can be reduced in the future; (3) provide "type" experience to the NMFS so that when CZCS data become more generally available the NMFS will be better equipp to handle data; (4) provide groups working the CZCS data added experience for advisin the National Oceanic Satellite System (NOSS) by fully testing and utilizing present systems including data processing capabilities; and (5) demonstrate CZCS data utilit Present at the meeting were: Jack Sherman [National Environmental Satellite Service (NESS)], Tom Leming (SEFC), Dennis Clark (NESS), Mike Laurs (SWFC), George Maul (Environmental Research Laboratories' Atlantic Oceanographic and Meteorological Laboratory), and Jim Thomas (NEFC).

January

In January, a standardized methodology for the sampling of total suspended matter as part of the sea truth for the Large Area Marine Productivity-Pollution Experiments (LAMPEX) was developed by Craig Robertson. The document on LAMPEX has been reviewed and approved by authorities on both the East and West Coasts. The LAMPEX III data report for the November-December 1979 Ocean Pulse cruise is nearing completion and will be distributed shortly. Negotiations were completed between

Dr. James Thomas of the Sandy Hook Laboratory and Richard Anderson of the Naval Ocean Systems Center at San Diego, CA, to have an operator and RSI Underwater Radiometer on board the 4-25 February Albatross IV cruise between Chesapeake Bay and the Mississippi Delta to obtain downwelling and upwelling light measurements as part of the sea truth required for the CZCS. Additionally, an agreement was established with Exxon Production Research Company of Houston, TX, to analyze sediments collected from this same area for heavy (C_{15+}) hydrocarbons.

The algal bioassay diatom, Thalassiosira pseudonana, was grown in natural and synthetic seawater media to determine typical growth characteristics under the incubation regime in our lab. Galley sheets were reviewed for two papers, "Bloom Decomposition", Chapter 9, Part 2, of the NOAA Professional Paper on the 1976 anoxia event in the New York Bight, and, "Possible Association of Fishing Gear Clogging with a Diatom Bloom in the Middle Atlantic Bight," which will be printed in the spring issue of The Bulletin of the New Jersey Academy of Sciences.

A proposal to Sea Grant for the study of factors which promote abundance of specific phytoplankton grazed by juvenile anchovy in California coastal waters was reviewed by John Mahoney.

Myra Cohn continued examination of whole-water, unconcentrated samples collected during March and May 1979 for phytoplankton species identification and counts as part of the MARMAP and Ocean Pulse Programs. Samples from the October and November 1978 cruises have been examined and are being entered into the Automatic Data Processing Unit (ADP) files at the Sandy Hook Laboratory. The most recent collections from the November-December Ocean Pulse cruise have been divided between Myra Cohn and Dr. Harold Marshall at Old Dominion University and the latter set has been sent to Dr. Marshall. Taxonomic keys and references for papers dealing with phytoplankton were sent to Donna Busch of the Narragansett Laboratory upon her request.

Coastal Ecosystems Investigation

December

Most of our efforts this month revolved around final planning and implementation of the eighth Ocean Pulse monitoring cruise, which took place aboard the Delaware II between 3 and 18 December. Frank Steimle was chief scientist on the second leg, and Dave Radosh handled the sediment and benthic macrofauna sampling for both legs. Willie Krencik and Keith Vinal, students who spent 3 mo at the Sandy Hook Laboratory under Southampton (Long Island) College's internship program, also participated on the cruise, primarily to process nutrient samples.

Fifty-two stations were sampled on the continental shelf between Canada and Cape Hatteras. The sampling pattern was somewhat revised and expanded from that of prior cruises. We also changed from our traditional 1.0-mm-mesh sieves to 0.5-mm ones for screening macrofauna -- this followed a recommendation of the Ocean Pulse Benthic Ecology Review Committee.

Jan Caracciolo Ward completed a revision of the atlas on distribution and abundance of dominant benthic macrofauna species in the New York Bight apex, and continued to develop her file on life histories of Middle Atlantic benthos. Russ Terranova worked on calorimetric measurements of sharks and their prey items such as tuna and porpoise; these samples were supplied by Charles Stillwell of the Narragansett Laboratory/Apex Predators Investigation. Bob Reid and Ann Frame were involved with manuscripts involving macrofaunal impacts of anoxia and spoil disposal, respectively.

January

Bob Reid chaired, and Frank Steimle participated in, a working group to form a technical development plan for NEPMAR (See "CENTER DIRECTORATE/Environmental Management Office" section). There is presently some overlap in the studies of the three involved NOAA offices, and one of the working group's major objectives is to increase integration and reduce redundancy between programs. Integration of FY 1980 may consist mainly of piggybacking on NOS cruises to take additional Ocean Pulse measurements at several ocean dumpsites, and cooperation with MESA in summer water column and benthic sampling in the New York Bight.

Frank Steimle also began the overall planning for the spring Ocean Pulse cruise aboard the Kelez; worked on the "Ocean Pulse Newsletter;" and worked on manuscripts concerning the benthos of Block Island Sound, caloric contents of some Middle Atlantic apex predators and their prey, impacts of dumping on New York Bight apex benthos, a nuisance diatom bloom in the Middle Atlantic, and a hydrographic atlas of 1978 MARMAP data. Jan Ward continued to develop life history summary files for dominant New York Bight apex benthic invertebrates, and to revise a draft benthic atlas concerning these dominant species. Russ Terranova ran calorimetric measurements on Ocean Pulse and other specimens, and plotted bottom salinity, temperature, and dissolved oxygen data collected by MARMAP in 1978 for input to a hydrographic atlas based on those data. Sukwoo Chang again worked with the Ocean Pulse group, planning for management and statistical analyses of Ocean Pulse data. Sukwoo also aided Arlene Longwell with statistical analysis of data. Dave Radosh and Bob Reid continued work on a manuscript describing benthic impacts and recovery after the 1976 anoxia.

Meetings, Talks, Visitors, and Publicity

Dr. F. Thurberg and R. Greig attended a MESA meeting on 4 December 1979 in New York City with the committee concerned with evaluation of organic pollutants in the New York Bight.

On 10 and 11 December and 7 and 8 January, Drs. Carl Sindermann and John Pearce met with representatives from the NOAA Offices of Oceanic and Atmospheric Services and of Research and Development to further the integration of monitoring activities ongoing within these two offices and the NMFS into a single unified monitoring program. The December meeting resulted in a final plan so that joint monitoring activities could be initiated in FY 1980. Moreover, the document will be important in the FY 1982 budgetary process.

On 14 December, Dr. Pearce met with other NOAA personnel, including people from the NOAA Manned Undersea Science and Technology Office, to discuss the feasibility of using various undersea technologies in the study of pollution. Following this meeting, Dr. Pearce worked with Dr. Richard Grigg of the Hawaii Institute of Marine Biology to develop a prospectus on this subject.

On 18 December, Dr. Pearce met with Drs. Brad Brown and Ambrose Jearld to discuss the possibility of awarding Ocean Pulse contracts to minority schools. It was decided at this meeting that there would be a special meeting held in the Washington, DC, area to which faculty members from various minority colleges would be invited. The principal purpose would be to review the Ocean Pulse monitoring program and to determine if there is interest, within the capabilities of the numerous minority academic institutions, to participate in the Ocean Pulse Program.

On 20 December, Drs. John Pearce and Merton Ingham met at the Milford Laboratory with Mr. Robert Marak to discuss the upcoming Ocean Pulse cruise designed to conduct remote-sensing, sea-surface-truth measurements in concert with NASA remote-sensing overflights, and to collect samples for petroleum hydrocarbon analyses.

Jim Thomas and Craig Robertson attended a MESA/SINC (synoptic investigation of nutrient cycling) workshop at Lamont-Doherty Geophysical Observatory on 20 December to respond to outside review of a final report on SINC activities. The final draft, to be written in early January, will be produced as a NOAA Technical Report.

Dr. F. Thurberg hosted a meeting of IYABA on 26 December 1979 at the Milford Laboratory.

Dr. M. Freadman, a Yale Postdoctoral Fellow, working with the Physiology Group on the Brett Respirometers, presented a paper at the American Society of Zoologists meeting in Tampa, FL, during 26-31 December 1979 on energetics of locomotion in cunners and tautogs.

Dr. Anthony Calabrese participated in a MESA Editorial Board meeting in New York on 7 January.

Clyde MacKenzie spoke at the Second Annual Oyster Culture Conference in Annapolis, MD, on 7 and 8 January.

On 8 January, Jay O'Reilly met with Ken Sherman, Geoff Laurence, Donna Busch, Jack Green, and John Walsh and colleagues at the Brookhaven National Laboratories in Upton, NY, to discuss several shelf ecosystem processes and report on progress to date on productivity-chlorophyll distributional studies.

On 10 January, Drs. Carl Sindermann and John Pearce participated in the Center Promotion Review Board meeting held at the Woods Hole Laboratory. Drs. Pearce and Sindermann also met at Rockville, MD, on 16 January to discuss further the NOAA tri-office cooperation in regard to marine pollution monitoring.

Jay O'Reilly met with Ken Sherman, Ron Schlitz, Donna Busch, Jack Green, and Jack Colton on 17 January at the Narragansett Laboratory to discuss progress in studies of nutrient flux across the Nantucket current-meter transect.

On 18 January, Robert Reid, Frank Steimle, Jim Thomas, and Darryl Christensen from the Sandy Hook Laboratory met with Dave Goodrich and Neal Millett from MESA and Mike Devine from NOS to initiate the preparation of a joint monitoring technical development plan (TDP) for NEPMAR.

On 21 January, Jay O'Reilly and Vincent Zdanowicz met with Tony Calabrese, Fred Thurberg, and Dusty Gould at the Milford Laboratory to discuss priorities for heavy metal analyses of Ocean Pulse samples.

During 21-25 January, Dr. James Thomas and Mr. William Phoel participated in the NOAA Hazardous Materials Response Project Training Session held at Santa Barbara, CA. Presentations were made by both individuals concerning offshore biology and the use of divers, submersibles, or underwater cameras as part of NOAA's response to an oil spill. This is the second year that NEFC personnel have had a significant role in this training activity.

Jay O'Reilly attended a meeting of IYABA at Narragansett, RI, on 22 January.

On Thursday, 24 January, Dr. John Pearce participated in a NOAA meeting concerned with the organization of regional workshops to be concerned with developing national marine pollution monitoring programs. This meeting was held in Boulder, CO.

Dr. Anthony Calabrese participated in a project advisory group meeting of the NMFS National Microconstituent Program on 25 January in New Orleans.

Jan Ward attended a technical writing course in New York City on 29 January - 1 February.

Frank Steimle, Bob Reid, Ruth Waldhauer, Andy Draxler, and several other people from the Sandy Hook Laboratory attended a statistics course at Sandy Hook given by Mike Pennington of the Woods Hole Laboratory on 30 January-1 February.

Dr. J. Graikoski participated in a Master of Science Review Committee for Ms. Christine Karvolis at the University of Bridgeport.

Mr. Richard Greig and Dr. John Graikoski visited the New England Aquarium to discuss with aquarium staff the sampling protocols for collecting tissues and blood from dying harbor seals. The tissues will be analyzed for heavy metals and the blood samples will be cultured for bacteriological characterization.

Al Matte and Ruth Waldhauer visited Dr. George Luther of the Chemistry-Physics Department of Kean College to learn the operation of new electrodes used in polarographic analysis of dissolved metals in water.

Bori Olla met with co-investigators in Battelle, Pacific Northwest Laboratories in Sequim, WA, to discuss ongoing research. From there he traveled to the Tiburon Laboratory to confer with Ted Hobson and Janet Whipple on aspects of research of common interest.

Bori Olla and Bill Steiner attended a symposium on "Research on Environmental Fate and Effects of Drilling Fluids and Cuttings" at Lake Buena Vista, FL.

Bill Phoel attended the ASLO meetings at Los Angeles, CA. He met and had productive discussion with Drs. Ken Smith and Mario Pamatmat concerning benthic metabolism and regeneration of nutrients from the seabed.

Anne Studholme attended the American Association for the Advancement of Science (AAAS) meeting in San Francisco, CA.

Publications

Cohn, M. Phytoplankton "hot spots". Coast. Oceanogr. Climat. News. (S)

MacInnes, J. Response of embryos of the American oyster, Crassostrea virginica to heavy metal mixtures. Mar. Environ. Res. J. (A)

Mahoney, J. B. Bloom decomposition. Sindermann, C. J.; Swanson, R. L. eds. Oxygen depletion and associated mass mortalities in the New York Bight, 1976. NOAA Prof. Pap. (A)

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Olla, B. L.; Studholme, A. L.; Bejda, A. J.; Samet. C. The role of temperature in triggering migratory behavior of the adult tautog, Tautoga onitis, under laboratory conditions. Mar. Biol. (A)

Olsen, P.; Cohn, M. S. Phytoplankton in Lower New York Bay and adjacent New Jersey estuarine and coastal areas. Bull. N. J. Acad. Sci. 24(2):59-70; 1979. (P)

Radosh, D. J.; Reid, R. N. Impacts to benthic macrofauna and recolonization following 1976 hypoxia off New Jersey. (Abstract). Bull. N. J. Acad. Sci. 24(2):98;1979. (P)

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Reid, R. N.; Frame, A. B.; Wilhelm, T. E.; Radosh, D. J. Sediments and benthic macrofauna of the Baltimore Canyon Trough off New Jersey. (Abstract). Bull. N. J. Acad. Sci. 24(2):98;1979. (P)

Steimle, F. W. Chronically depressed zone of dissolved oxygen identified along northern New Jersey coast during 1977-1979. Coast. Oceanogr. Climat. News;1979. (P)

Steimle, F.; Ward, J.; Pearce, J. Impacts of dumping on New York Bight apex benthos. Ecological stress and the New York Bight: science and management: proceedings of a MESA symposium; 1979 June; New York, NY. (S)

Wilhelm, T. E.; Steimle, F. Effectiveness of three aliquot samples in splitting benthic macrofauna: a preliminary report. (Abstract). Bull. N. J. Acad. Sci. 24(2):98;1979. (P)

Reports

Matte, A.; Waldhauer, R.; Draxler, A. Nutrient data from the cruise of the Whiting. Sandy Hook Lab. Rep. No. 79-39;1979.

AQUACULTURE DIVISION

Aquacultural Genetics Investigation

Selective Breeding of Oysters

A study examining realized selection gain when selection is practiced on 4-yr-old brood stock versus 2-yr-old brood stock is being initiated. Two hundred twenty-seven 4-yr-old oysters and 144, 2-yr-old oysters are being conditioned out of season for spawning for this purpose. Attempts will be made in the ensuing months to spawn these brook stocks simultaneously and set up contemporary controls in both groups.

Measurements of the 1978 year-class stocks are continuing. Excess cultch material is being sorted from the 1979 year-class set. The 1979 year class is also being counted and sampled for growth data.

The F_2 generation in the larval selection experiment, now approximately 9 mo old, is being measured to determine if a growth differential between days and/or lines is discernible.

Experimental Hybridization and Inbreeding of Oysters

Our first conditioned group of commercial American oysters (Crassostrea virginica) for the season spawned quite well, producing several million gametes for use in geographic hybridization studies. Early larval survival was high.

Preliminary data on juvenile growth rates of the American oyster and Japanese oyster (C. gigas) in a recirculating seawater system, seem to indicate a faster growth rate in the C. gigas juveniles.

Aspects of the Aquacultural Genetics Investigation were described by Sheila Stiles in a short, popular-type article on "Oyster Genetics: Conventional and Experimental Breeding Research," published in Karyogram, a newsletter for cytogenetic technologists.

Spawning and Rearing of Mollusks Investigation

An experiment with juvenile surf clams has explored the acclimation necessary for clams, held at ambient winter temperatures, to resume active growth in a lab culture. Clams maintained at temperatures under 5°C were acclimated to 19°C over a 36-hr period. Groups were fed one of six concentrations of cultured algae. After 1 wk, several clams in the two highest algal concentrations had died. After 2 wk, all clams in the two highest concentrations and several clams in the next highest level had died. No mortality was observed in the three lower food concentrations. The surviving clams were redistributed to the original six algal levels without mortality after a week. Growth of clams then began at a level comparable to that previously recorded for clams reared when ambient temperatures were above 15°C. These results are interpreted as illustrating the need for acclimation of nutritional metabolism, as well as thermal acclimation. It is speculated that the sudden temperature rise and abundance of algae created a physiological imbalance. The imbalance appears to have come to equilibrium by gradual acclimation to higher food levels. The results of this experiment suggest that under these conditions, a gradual acclimation to elevated algal levels should be effected.

Visitors

Visitors to the Milford Laboratory during January were Mark Leslie of Southeastern Massachusetts University in South Dartmouth, MA; Karen Middleton of Wellfleet, MA; and Wally Festa of the Little Harbor Laboratory in Guilford, CT.

Publications

Goldberg, R. Biological and technological studies on the aquaculture of yearling surf clams. Part 1. Aquacultural production. Nat. Shellfish. Assoc. Proc. 70. (A)

Stiles, S. Oyster genetics: conventional and experimental breeding research. Karyogram 5(2):11,16;1979. (P)

PATHOBIOLOGY DIVISION

Comparative Invertebrate Pathology Investigation

A service sample of queen conchs (Strombus gigas) from the British West Indies was examined at the request of PRIDE, the Society for the Protection of Reefs and Islands from Degradation and Exploitation. Problems in the water system were suspected as the cause of mortalities observed in the conch culture trays. Conch tissues were examined for parasites and pathology to determine if the cause of the mortality was due to an infectious agent. No parasites were detected. The histologic presentation of these tissues (tissue degeneration and bacterial necrosis) is consistent with mortalities due to environmental stress.

Protocols and material for the sampling of certain shellfish for Ocean Pulse studies were prepared and presented to members of the Resource Assessment Division (RAD). Samples obtained from the January RAD cruise have been collected and will be examined and the data compared with information collected during other regular Ocean Pulse cruises.

Glen L. Evans, an undergraduate student from Colgate University, spent a 3-wk training period at the Oxford Laboratory studying various aspects of lab activities. As part of the teaching expertise during this time, he collected, processed, cut, and stained his own sections of oyster tissues. Using these sections, he was able to study the microanatomy and normal histology of the oyster. He was also instructed in photomicrography, taking his own pictures, developing them, and printing them for use in his school report.

Mr. Farley spent most of the month participating as instructor in the Comparative Pathology of Marine Invertebrates course at the Marine Biological Laboratory in Woods Hole, MA, given by Dr. F. Bang, Chairman of the Department of Pathobiology at Johns Hopkins School of Public Health and Hygiene. Five lectures presented on molluscan pathology and laboratory sessions included demonstrations of molluscan lesions and parasites, and instruction on comparative hematology methods. Forty percent of the class chose research projects using oysters as experimental models. Clams from Falmouth Harbor were examined hematologically and 2 of 14 had leukemialike diseases.

Ocean Pulse transit sampling logistics were developed for the collection of blue mussels from two sites in Maine, two sites in Massachusetts, three sites in New Jersey, and two sites in Delaware. Samples from Maine were received and processed.

Computer program formats developed by Dr. Jack Foreman of the Environmental Data and Information Service in Washington, DC, for management of data collected on deepwater dumpsite cruises were reviewed and considered for modification. Fish pathology codes and formats developed for MESA and the Outer Continental Shelf Environmental Assessment Program (OCSEAP) are being modified to accept information relative to diseases of planktonic crustaceans. When completed, data entered and combined with other data collected on the cruises should provide a significant archived data base of ocean dumping information.

In planning other Ocean Pulse sampling strategies, expert advice was solicited from Mrs. Ann Frame of the Environmental Assessment Division at the Sandy Hook Laboratory. Species of benthic amphipods to be surveyed and tentative choices of Ocean Pulse stations have been made. A relatively firm commitment has been made to sample at five Ocean Pulse stations where fair to large amphipod populations may be expected. Data are lacking on other stations, but several will be investigated to determine whether amphipods occur in sufficient numbers to make their inclusion worthwhile. Preparation of a manuscript on histopathology of gaffkemia in lobsters is progressing, and has been the major activity undertaken this month by the crustacean pathology project.

Fish Pathology Investigation

The remainder of the sand lances collected during fall Ocean Pulse and bottom trawl surveys have been x-rayed and examined. Over 900 individuals were examined this year. Anomalies of the axial skeleton were found in over 20% of the individuals collected at some stations. The overall prevalence for all stations exceeds 12%. No analysis of differences between stations will be made until the sample size becomes much larger. A preliminary examination of the data does not reveal any correlation of the prevalence of anomalies with the length of the fish. This should be the case with nonlethal defects which would probably originate during embryonic or larval development. Most anomalies consist of dysplasias, usually compressed vertebrae or paired neural spines. Aplastic vertebrae are the second largest class of anomaly.

In other Ocean Pulse-related studies, difficulties were encountered in holding specimens for experimental lab studies in that the remaining supply of juvenile striped bass to be used in experiments on the effects of heavy metals on sensory tissues died because of fungal and other parasitic infections. In other laboratory studies, light

and electron microscopic examination of olfactory tissues in summer flounder larvae exposed to 0.1 ppm Cu++ for 24 hr are continuing and the results of this work should be available in the near future.

Several other activities in January involved preparation of manuscripts. A manuscript on "An Erythrophoroma of Ornamental Carp, Cyprinus carpio" was revised for Oxford Laboratory internal review. A manuscript titled "Some Pollution-Associated Diseases and Abnormalities of Marine Fish and Shellfish: a Perspective for the New York Bight" was received from the reviewers. The manuscript was revised and photographs for figures prepared. The manuscript will be published in the book, Ecological Stress and the New York Bight: Science and Management. Another manuscript, "A Comparison of Fin Rot Disease in Flounder from Ecologically Degraded Coastal Areas in California, New York, and Washington," is being drafted. The manuscript will be submitted to the Journal of Fish Diseases and is coauthored by Marjorie Sherwood of the Southern California Coastal Water Research Project and Bruce McCain of the NWAFC's Environmental Conservation Division. A manuscript on cooperative Ocean Pulse-related work has been completed concerning the fine structure of the fouling community (microbial) and protozoans found on the gills of rock crabs collected in the New York Bight, Sandy Hook Bay, and Philadelphia-Wilmington dumpsite. The report describes the morphology and relationships of 10 structurally distinct types of bacteria, a naviculoidlike diatom, and several protozoans. The potential trophic interactions between the various organisms are considered as well as their possible use in monitoring marine pollution.

Microbial Ecology and Parasitology Investigation

Sediment samples were collected at stations located near the mouth of Chesapeake Bay and running northward along the 55-m line to the New York shipping lanes near Ambrose Light. The work unit was accomplished as part of a NOAA-USEPA cruise with the Kelez to obtain data on coliforms, heavy metals, sediment sizes, etc., distributed in the offshore environment. Twenty-one sediment samples were used for preparing six replicate cultures (for a total of 126 cultures) to estimate the distribution of potentially pathogenic amoebae (Acanthamoebidae) as related to the distribution of bacteria. In agreement with data from current research, the amoebae were present only in sediments from stations known to be impacted by sewage dumping practices. At present, data from this study indicate that the amoebae may be recovered from 75% of the sewage stations in the New York Bight apex, 25% of the Philadelphia-Camden dumpsites, and 2-3% of the non-impacted or control stations. Arrangements have been made to initiate studies to count the numbers of amoebae present per gram of sediment since nothing is known about their numerical abundance in ocean sediments.

Histological studies have been completed on 100 rock crabs (eastern species) collected from the New York Bight apex. Gills and digestive gland from each animal were frozen for heavy metals studies (i.e., Cu, Pb, Cd, and Ag) by Richard Greig at the Milford Laboratory, who now has completed his analyses on 50 of these samples. The crabs have been divided into three groups on the basis of microscopic findings and gross observations: (1) abnormal gills, (2) normal gills with moderate-to-heavy external fouling, and (3) normal gills with minor fouling. Thirty of the 100 crabs fell into category (1) and 10 had abnormal gill conditions which could be attributed to protozoan infection (microsporidians), hemocyte destruction following probable bacterial phagocytosis, or hemocyte destruction following hemocyte encapsulation and nodule formation with melanization. The remaining 20 animals had gills which showed hemolymph coagulation, swollen lamellae, or tissue death with lamellar necrosis and melanization. The disease conditions in gills in 67% of the abnormal group did not appear to have a specific etiology and will be studied further with regard to forth-

coming heavy metals data. Plans have been made to initiate a follow-up study with rock crabs collected from the Philadelphia-Camden dumpsites and from sites which do not receive barge-delivered wastes.

Diseases of Larval Mollusks Investigation

A series of comparative antibiotic sensitivity tests was completed against a Vibrio sp. isolated from a Maine and a California shellfish hatchery. A strong similarity in test results was obtained in which the organisms showed increasing resistance to the following antibiotics: penicillin, streptomycin, neomycin, nitrofurantoin, tetracycline, and novobiocin. Eleven other biochemical tests suggest similarity of characteristics in these two isolates found in hatcheries which exchange brood stock. Additional tests are underway to confirm or refute this apparent resemblance.

In bacterial inactivation studies, data from ultraviolet radiation sensitivity tests show that one of two isolates cultured from a Long Island hatchery is inhibited by exposure to ultraviolet (UV) light, but is not killed by it. Information gathered from these tests also suggests that growth of this isolate can be arrested by the presence of the other isolate. Data showed that the latter isolate, when tested alone, is sensitive to the UV dosage used throughout the study. Further investigation, however, indicates that this isolate can survive UV exposure when the two isolates are tested together. A definitive statement must await the results of biochemical and physiological tests being performed on suspect colonies.

To date, no one has been able to determine the mechanism by which molluscan blood cells move toward and engulf foreign particles. Hints from work done in mammalian systems have spurred the investigation of the phenomenon in oyster cells. Current experiments have shown that the ability of oyster blood cells to engulf bacteria in vitro was greatly enhanced if the bacteria were treated with a weak Formalin solution. Engulfment was also enhanced, but to a lesser degree, if the bacteria were first coated (opsonized) with oyster hemolymph. Bacteria that were both Formalinized and opsonized were engulfed at the same rate as opsonized bacteria. Testing of bacteria by partitioning in a two-phase system of phosphate buffer and butanol showed that Formalin treatment increased surface hydrophobicity (or negative charge). Further refinement and use of two-phase systems should indicate to what extent oyster hemolymph may change the hydorphobicity of foreign particles.

Meetings, Talks, Visitors, and Publicity

Dr. Rosenfield attended a Large Area Marine Productivity-Pollution Experiments/ Superflux meeting at Langley, VA, on 4 and 5 January; Drs. Rosenfield and Murchelano attended a Center Promotion Committee meeting at the Woods Hole Laboratory on 10 and 11 January; and Dr. Rosenfield and Ms. Hines, the Oxford Laboratory Librarian, visited the University of Maryland Eastern Shore campus and discussed implementation of the Cooperative Work-Study Program and minority employment programs at the Oxford Laboratory.

Mr. Farley participated in a course, Comparative Pathology of Marine Invertebrates, at the Marine Biological Laboratory in Woods Hole, MA, during 5-22 January, and presented lectures in molluscan pathology.

Dr. Sawyer and Mr. Galasso collected crabs for heavy metal analyses at Sandy Hook, NJ, on 10 January.

An interagency conference with staff members of the Fish and Wildlife Service National Fisheries Center-Leetown was held at the Oxford Laboratory on 14 January to discuss cooperative research on diseases of fishery resources.

Ms. MacLean attended an IYABA meeting at Narragansett, RI, on 22 January, and has taken on the role of Program Coordinator for the NEFC Research Meeting to be held 1-3 April in Woods Hole.

Dr. Johnson presented lectures to invertebrate pathology students at the Marine Biological Laboratory in Woods Hole, MA, on 25 and 26 January.

Mr. Kern attended a Center EEO Committee meeting at Narragansett, RI, on 29 and 30 January.

Dr. Blogoslawski met with Dr. John Buck of the Noank Marine Laboratory of the University of Connecticut, to discuss cooperative yeast infection-depuration experiments on oyster spat and adults.

Members of the Maryland Department of Natural Resources met with Drs. Rosenfield and Bodammer on 31 January to discuss plans for the stocking of Oxford Laboratory ponds with fish for the forthcoming fishing rodeo to be held at the Laboratory.

In ceremonies held at the Oxford Laboratory on 16 January, Mr. Barney Brooks was awarded a 20-yr length of service pin; and Ms. Ceil Smith and Ms. Dorothy Howard were honored with sustained superior performance awards.

Ms. Lisa Petti completed her work-study assignment with the Pathobiology Division at the Milford Laboratory on 28 December; her replacement is Barry Nawoichik who began a work-study assignment on 2 January. Mr. Stephen Tettelbach entered on duty on 21 December on a 1040-hr appointment.

Publications

Blogoslawski, W. J. Use of chlorination in the molluscan shellfish industry. Proc. Third Conf. Water Chlorin. (S)

Daggett, P. M.; Nerad, T. A.; Sawyer, T. K.; Lewis, E. J. Preliminary observations on the possible use of starch-gel electrophoresis as an effective method for separation of Acanthamoeba species. Trans. Am. Microsc. Soc. (A)

Murchelano, R. A. Environmental quality as a factor in the diseases of fish and shellfish. Maritimes. (A)

Murchelano, R. A., Rosenfield, A.; Swann, B. J. A National Registry of Marine Pathology. (Abstract). Proc. Int. Assoc. Aquat. Anim. Med. (S)

Visvesvara, G. A.; Sawyer, T. K. Antigenic analysis of pathogenic, euryhaline, and eurythermal Acanthamoeba hatchetti (Amoebida: Acanthamoebidae). (Abstract) Trans. Am. Microsc. Soc. (A)

NATIONAL SYSTEMATICS LABORATORY

Penaeoid Shrimp Investigation

A draft of a manuscript was completed describing a new species of rock shrimp (Sicyonia) from the tropical western Atlantic. Work continued on a revision of all the American rock shrimp species.

Crustacea Investigation

A manuscript was completed, which describes a new family, genus, and species of brachyuran crab from 2500 m on the Galapagos Rift in the eastern Pacific. This crab is of particular interest as it lives in and around thermal vents and is an important member of the unique biota associated with this ecosystem.

Preparation continued of a handbook of decapods of the temperate waters of the eastern US.

Benthic Fishes Investigation

Compiled were data taken during submersible dives to the Galapagos Rift thermal vents.

Work was done on the description of a new species of deepwater ophidiid (Enchelybrotula) from the eastern Pacific.

Completed was the section on Argentinidae for the United Nations Educational, Scientific, and Cultural Organization (UNESCO) publication on "Fishes of the Northeast Atlantic and Mediterranean."

Pelagic Fishes Investigation

Completed was the compilation of synonymies for the 18 known species of Spanish mackerels (Scomberomorus).

Intern

Miss Susan Poisson of Colgate University worked with Drs. Collette and Canet.

Visitors

Visitors during January were Dr. Adam Ben-Tuvia of Hebrew University of Jerusalem, Mr. Hubert E. Wood of the Trinidad Division of Fisheries, Harlan Dean of the University of Delaware, and Darryl Felder of Southwestern Louisiana State University.

Publications

Collette, B. B. Families Scombridae, Belonidae, and Hemiramphidae. In FAO Species Identification Sheets for the Western Indian Ocean. Rome, Italy:FAO. (S)

Williams, A. B. A new crab family from the vicinity of submarine thermal vents on the Galapagos Rift (Crustacea: Decapoda: Brachyura). Proc. Biol. Soc. Washington. (S)

ATLANTIC ENVIRONMENTAL GROUP

Ocean Monitoring and Climatology Task

A series of daily solar radiation measurements from 1952 to 1976 have been acquired from the National Climatic Center (NCC). The measurements were made at Newport, RI, by the Eppley Corporation, about 3 mi from the open coast (Lands End). The 1952-76 data were available on magnetic tape and have been incorporated into the MARMAP Information System. Also, manuscript data are available at NCC from 1930 to 1951 and from 1977 to date, but they have not yet been keypunched for addition to the base. Anyone wanting a list-out or derived portrayal of the 1952-76 data for correlative studies should contact Jack Jossi of AEG.

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

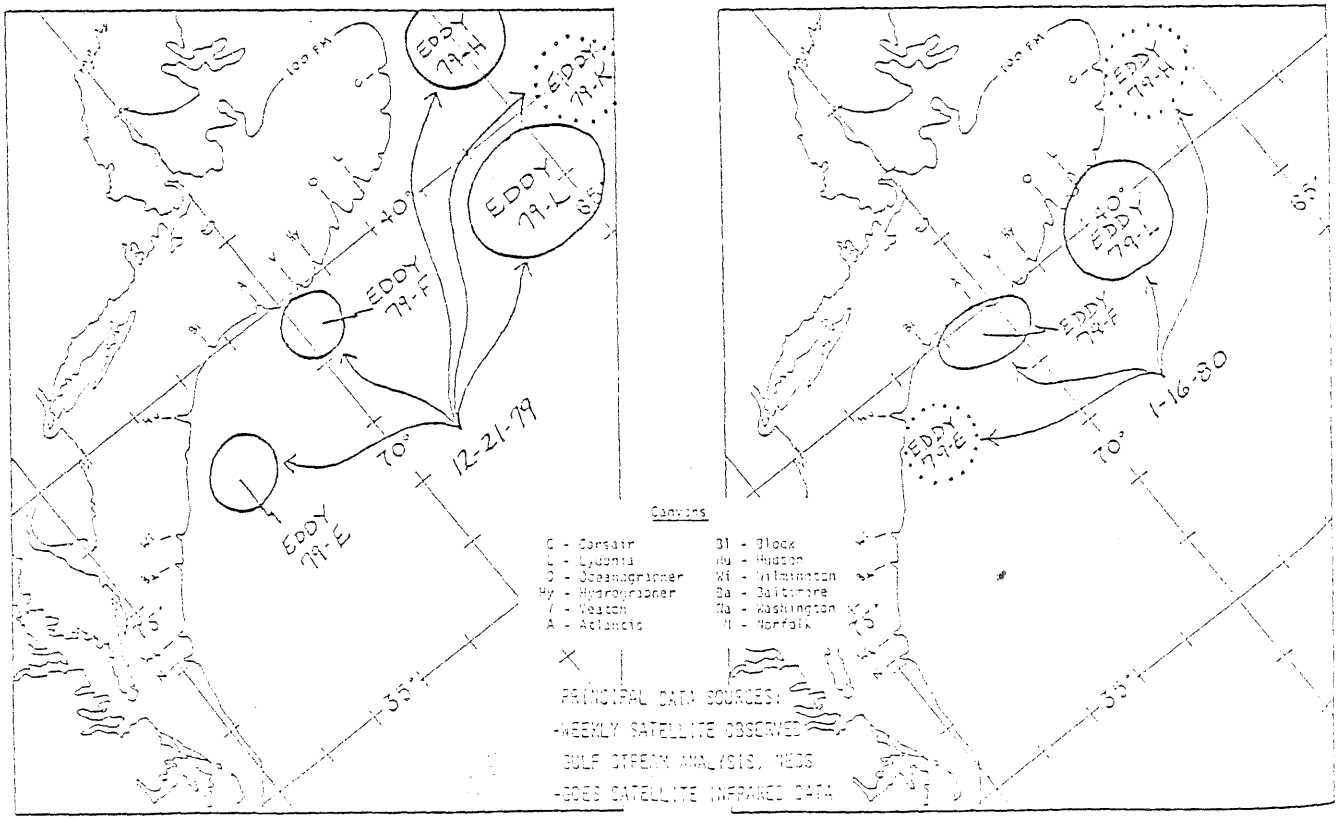
GULF STREAM EDDY LOCATIONS

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-January.

Eddy 79-E moved northeast and then west from mid-December to mid-January, resulting in a net northward shift of about 20 nm (37 km) to a location centered at about 39.0°N, 72.1°W, south of Hudson Canyon. Eddy 79-F moved west about 35 nm (65 km) to a location centered at about 39.7°N, 70.4°W, south of Atlantis Canyon. Eddy 79-L moved WNW from its place of origin about 105 nm (195 km) to a location centered at about 39.8°N, 67.6°W, to the south of Lydonia Canyon. Recent analysis indicates that eddy 79-K was resorbed by a Gulf Stream meander at the beginning of December, when centered at about 39.2°N, 65.9°W. Eddy 79-H moved west about 35 nm (65 km) to a location centered at about 41.0°N, 65.6°W, off Corsair Canyon.

During the next 30 days, eddy 79-E may move southwest past Wilmington Canyon; 79-F to the west to near Hudson Canyon; 79-L west southwest to the vicinity of Veatch Canyon; and 79-H southwest toward Lydonia 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, RI 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 cooperative Ship of Opportunity Program obtained six expendable bathythermograph (XBT) and three continuous plankton recorder (CPR) transects in January: two XBT and one CPR transect in the Gulf of Maine, two XBT and one CPR transect across the shelf and slope off New York, and two XBT and one CPR transect in the Gulf of Mexico.

Ocean Dumping Studies Task

Preparations for analysis of wind and wind-stress data have been made with the URI Data Projects Group. Wind and wind-stress rose diagrams, continuous vector diagrams and average daily wind vectors will be produced for each of the three radio-direction-finding (RDF) buoy experiments conducted during 1979.

Oceanographic equipment consisting of a Plessey 9040 STD (salinity-temperature-depth) unit, General Oceanics rosette sampler, and 12 Niskin bottles were shipped to the NOS Atlantic Marine Center (AMC) in Norfolk, VA. This equipment will be used aboard the Kelez during February and March.

Information concerning the COSRAMS data buoy and the TIROS-N data acquisition system is being assembled. Jim Bisagni and John Hartley traveled to Raytheon Environmental Systems in Newport, RI, and the USCG Research and Development Center in Groton, CT, to inquire about these satellite systems and their application to ocean dumping problems.

Meetings, Talks, Visitors, and Publicity

Mert Ingham traveled to Sandy Hook, NJ, on 3 and 4 January to confer with personnel on the Ocean Pulse Program.

On 7 and 8 January, Mert Ingham returned to Sandy Hook, NJ, to attend a meeting of the NEPMAR Program Development Plan Working Group.

A meeting of the Center Promotion Committee was held at Woods Hole, MA, on 9 and 10 January and was attended by Mert Ingham.

Talbot Murray, accompanied by Mert Ingham, went to Columbia, MO, during 21-25 January to confer with the Environmental Data and Information Service's Climatic Impact Assessment Division's scientists on joint fishery climatology studies.

Woody Chamberlin traveled to Woods Hole, MA, on 28 January to discuss the ecology of yellowtail flounder with Drs. Sissenwine and Brown.

On 29 January to 1 February, Mert Ingham was in Sandy Hook, NJ, working with Ocean Pulse Program members.

Publications

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. (A)

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

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

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

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

Langone, H. K.; Hilland, J. E. Unusual spring conditions at the 106 mile dumpsite. Gulfstream 5(9):6-7;1979. (P)

Leming, T. D.; Jossi, J. W. Observation of temperature and currents in the coastal waters near Cape Canaveral, Florida during 1970 and 1971. NOAA Tech. Rep. NMFS SSRF. (S)

Reports

Bisagni, J. J. July 1977 physical oceanographic studies at Deepwater Dumpsite 106. In Deepwater Dumpsite 106 assessment report. NOS.

Jossi, J. W.; Marak, R. R. MARMAP survey manual. 43 p. Contribution to NOAA fisheries technology shipboard manual.

Mizenko, D.; Chamberlin, J. L. Gulf Stream anticyclonic eddies and shelf water at Deepwater Dumpsite 106 during 1977. In Deepwater Dumpsite 106 assessment report. NOS.

Murray, T. E. A summary of waste inputs to Deepwater Dumpsite 106 during 1976 and 1977. Deepwater Dumpsite 106 assessment report. NOS.