

Internship Report

by

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School of Oceanography
Oregon State University

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in partial fulfillment of
the requirements for the
degree of

Master of Science

Internship: National Oceanic and Atmospheric Administration
Marine Ecosystems Analysis Program (MESA)
Boulder, Colorado & Seattle, Washington

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Marine Resource Management Master's Degree Program

INTERNSHIP

Oceanographer intern with the Marine Ecosystems Analysis (MESA) Program Office in Boulder, Colorado and the MESA Puget Sound Project Office in Seattle, Washington; National Oceanic and Atmospheric Administration (NOAA)/ Environmental Research Laboratories (ERL)/ Department of Commerce (DOC).

MARINE STUDIES

Descriptive Physical Oceanography
Biological Oceanography
Chemical Oceanography
Physical Processes in Estuaries
Marine Resources
Special Topic Study on the Coquille Estuary; Bandon, Oregon
Navigation

COASTAL ZONE MANAGEMENT

Coastal Zone Management
Natural Resources Policy
Land-Use Planning
Regional Economics
Outdoor Recreation Policy

LAW AND POLITICS

Environmental Law/Water
Environmental Politics
Ocean Politics

FISHERIES

Fishery Biology
Research Perspectives
Statistical Methods
Biochemistry (audit)

November 1, 1976

Dr. W. R. Hess
Environmental Research Laboratory
National Oceanic & Atmospheric
Administration
Boulder, Colorado 80302

Dear Dr. Hess:

It was a pleasure to meet you at the Joint Oceanographic Assembly and I surely appreciate the time you spent with me discussing the possibility of an internship in your office. From your descriptions, working on one of the projects at the Environmental Research Laboratory would satisfy my internship requirement while providing a very valuable learning experience.

My career goal is to focus on some aspect of seabed assessment and development of ocean resources, working on projects for national or international organizations, or private business. An internship in your office will certainly help me begin to achieve my goal, and I believe I am qualified to supply the assistance you might need.

Please find my Standard Form 171, resumé, and graduate class list enclosed. I will be happy to send any additional information you may need.

Many thanks for your suggestions and help. I look forward to hearing from you.

Sincerely,

Katherine S. Baker

2515 N.W. Millmore Avenue
Corvallis, Oregon 97330



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
ENVIRONMENTAL RESEARCH LABORATORIES
Boulder, Colorado 80302

DEC 10 1976

Ms. Katherine S. Baker
2515 NW Fillmore Avenue
Corvallis, Oregon 97330

Dear Kathy:

It is with pleasure that I confirm your selection to serve as an intern of the Marine Ecosystems Analysis Program Office of the Environmental Research Laboratories. You will be employed full-time with us as an Oceanographer, GS-07, at a pay rate of \$5.54 an hour. Your appointment will commence on January 3, 1977, and will expire on May 31, 1977. Please notify me if you encounter problems getting a flight to Denver on January 2 due to the holiday traffic. If necessary, we can delay your entrance on duty a few days.

Your assignment will involve working with the MESA staff in the development of the Puget Sound Project Development Plan (PDP), which is the basic planning document for the Puget Sound Project and will contain the technical and management guidelines for the life of the project. ~~I have enclosed a copy of your position description for further information.~~

While employed with us, you will earn sick and annual leave but will not be entitled to health benefits or government life insurance. Initial travel costs to Boulder prior to your appointment and those incurred on your return trip home at the end of your appointment must be at your expense.

I look forward to meeting you personally. Please do not hesitate to call me at the office or at home when your travel plans are firm and I can be of assistance to you.

Sincerely,

Carolyn S. Straight

Carolyn S. Straight
Area Personnel Officer

cc: J. Frank Hebard, MESA Program Director
Victor T. Neal, Director of Curriculum, Oregon State University



DESCRIPTION OF DUTIES, RESPONSIBILITIES, AND ACCOMPLISHMENTS

Oceanographer intern (full time) in the National Oceanic and Atmospheric Administration's Marine Ecosystem Analysis (MESA) Program Office in Boulder, Colorado and MESA Puget Sound Project Office in Seattle, Washington.

As a member of the NOAA Oil Response team in Falmouth, Massachusetts, assisted in arranging ongoing research and long-term effect studies of the ARGO MERCHANT and Buzzard's Bay oil spills; coordinated agencies in organizing oil tracking overflights; participated in field testing and evaluation of Coast Guard oil skimmers; and attended strategy planning meetings for the control of oil spills with representatives from other government agencies, universities, research institutions, and the general public.

Provided a synthesis/coordination/liaison function for MESA in developing the Project Development Plan, the basic long-range planning document for the MESA Puget Sound Project. This function included establishing project goals and objectives, research priorities, schedules and milestones, and tentative resource allocations.

Assisted staff in developing research priorities and plans, preparing requests for proposals, and reviewing proposals received. Assisted in administering contract research and participated in project reviews and briefings. Collected, interpreted, and integrated biological, ecological, and oceanographic data from published and unpublished sources and presented the results in oral or written form.

Participated in a phytoplankton baseline data cruise in the Strait of Juan de Fuca, and beach seined (bottom and surface tows) for intertidal organisms in Burrow's Bay and off Whidbey Island, Washington.

Coordinated and organized a project development workshop.

Assisted in the research and writing of a background summary of the Puget Sound region.

INTRODUCTION

MESA, the Marine Ecosystems Analysis Program, was established in 1972 within the National Oceanic and Atmospheric Administration (NOAA) to focus the research capabilities of NOAA and of federal, state, local, and private agencies upon specific environmental problems within well-defined geographical areas. The goals of MESA were established as:

- * Describing, understanding, and monitoring physical, geological, chemical, and biological processes of marine environmental systems;
- * Providing information and specialized support for the effective management of marine areas and for the rational use of their associated resources; and
- * Analyzing impacts of natural phenomena or man-made alterations on marine environments.

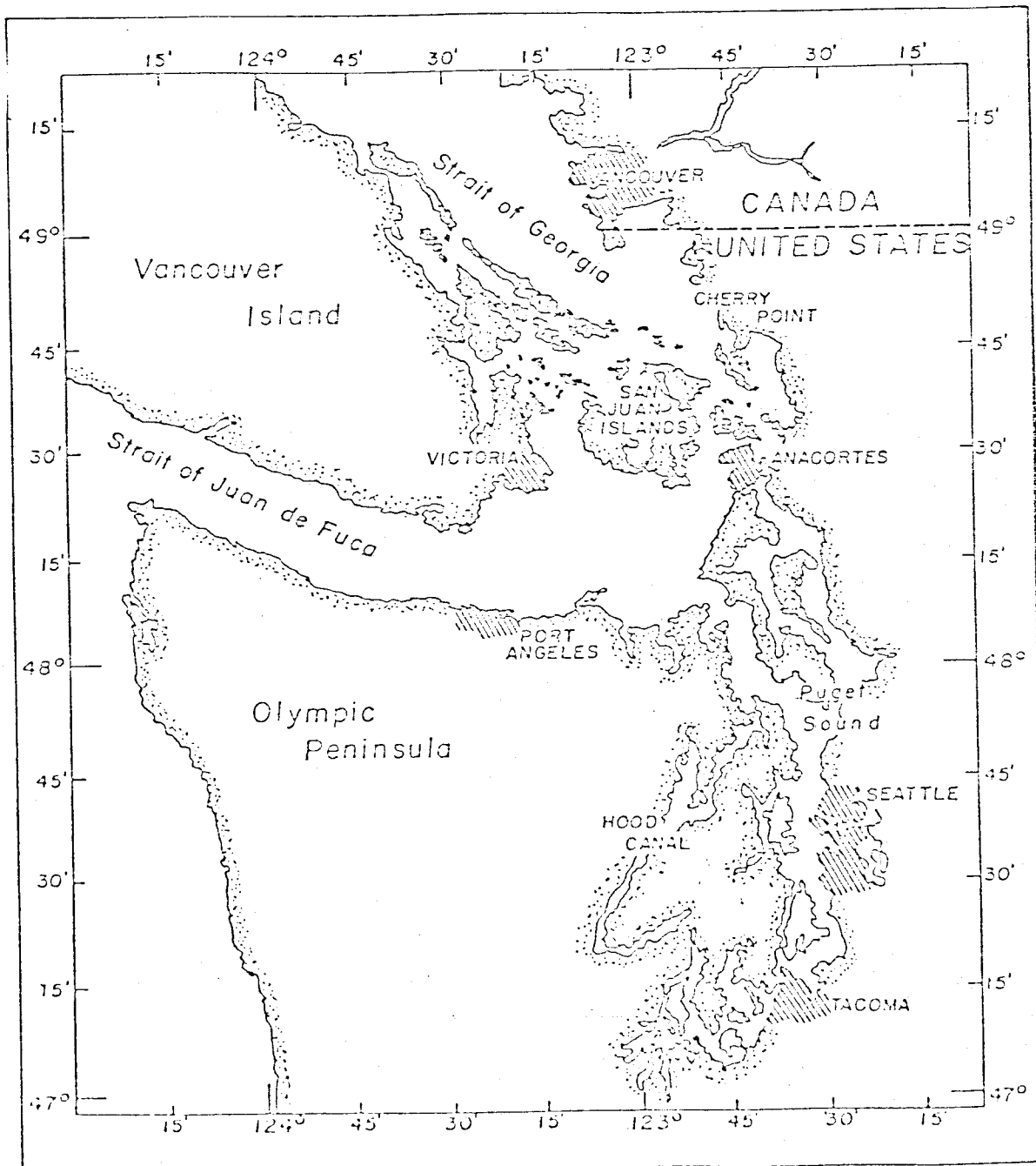
By working through relatively short-term projects (5-8 years) two advantages accrued. First, the basic understandings of ecosystem dynamics could be expanded and transferred to later projects, and second, project management and technical approach strategies could be continuously refined. The first MESA project was initiated in the New York Bight in 1972, with the purpose of minimizing and ameliorating environmental impacts in a heavily polluted region. Puget Sound, in contrast, was perceived as being in a transitional stage. No large scale environmental problems were evident, but isolated water quality problems which often presage extensive environmental degradation did exist. Thus, the MESA Puget Sound Project was initiated in Fiscal Year 1976 to address the fundamental issue of maintaining a high quality marine environment in the face of ever-increasing marine development. The Deep Ocean Mining Environmental Study (DOMES),

another MESA project, was organized in 1975 in order to answer the innumerable environmental questions which exist concerning the potential effects of large scale manganese nodule mining on the little understood abyssal plains of the ocean and the living resources of oceanic surface waters.

My internship with MESA resulted in a variety of learning experiences. The first six weeks were spent in Falmouth, Massachusetts working with the NOAA/MESA long-term effects group on the ARGO MERCHANT oil spill. The next ten weeks were spent at the Program Office in Boulder, Colorado working on overall Program development, planning, organization, management, and coordination. While in the Program Office, I focused on the development of the MESA Puget Sound Project Development Plan (PDP).

The PDP was designed to present a formal rationale and management plan for the environmental research necessary to implement specifically identified project goals. For the Puget Sound Project, the effects of petroleum transport/refining activities and large scale industrial and municipal wastewater disposal were identified as the major environmental problems confronting resource managers and planners. An ancillary objective of the Project was to interpret the data bases from the wastewater and petroleum studies with other more general information to develop a basic understanding of the complex ecosystem of Puget Sound and the Strait of Juan de Fuca.

Work on the Puget Sound PDP continued after transferring to the Puget Sound Project Office for the final four months of my internship. Although the PDP did not take up all of my time, it was a major area of emphasis.



THE PUGET SOUND REGION

WEEK OF JANUARY 3 - 7

I began my internship in the MESA Program Office (NOAA/ERL) in Boulder, Colorado on Monday, 3 January 1977. After going through the standard personnel processing procedure, I met the MESA staff (Appendix A) and was immediately included in Program Office activities and meetings.

A six membered Source Evaluation Board, chaired by Dr. Howard Harris (MESA Puget Sound Project Manager), met several times to discuss proposals received in response to MESA's Request for Proposals (RFP) for three different biological research projects in the Puget Sound region. As an educational exercise, I too read and evaluated the proposals and compared my results to those of the board. It was a valuable experience to sit in on and participate in these discussions in order to learn how contracts were let, what factors were considered, how factors were weighed and compared to each other, what points for negotiation might be, what was considered important by professionals with different backgrounds and why, etc.

The ARGO MERCHANT oil spill off Nantucket Island, Massachusetts was a pressing issue and several staff meetings and meetings with ERL Director, Dr. Wilmot N. Hess, were held to discuss what MESA's role should be in the follow-up studies. It was decided that this would be a golden opportunity for me to experience, first hand, government response to an environmental crisis situation. Therefore, I was made part of MESA's long-term effects team.

WEEK OF JANUARY 9 - 14

Sunday, I flew to Boston with other members of the MESA long-term effects group headed by Mr. John Robinson. Only one runway was open due to very strong winds, snow and ice condition, and extremely cold temperatures. Thus, we had to circle the airport several times before landing. We stayed in Boston Sunday night and left Monday morning to set up headquarters in Falmouth, Massachusetts at the Sheraton Inn. We stopped in Hyannis, Massachusetts where the NOAA/Coast Guard (CG) Spilled Oil Response (SOR) team were closing down their operation. That night we were joined by Mr. Garry Mayer and Mr. Stanley Chanesman of the MESA New York Bight Project, and Lieutenant Commander Barry Chambers, Commander of the CG Atlantic Strike Team.

Tuesday, John Robinson and I accompanied LCDR Barry Chambers to Boston for the Regional Response Team (RRT) meeting. The RRT was made up of twenty representatives from the United States Air Force, Army, Coast Guard, Corps of Engineers, Environmental Protection Agency, U.S. Geological Survey, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and Massachusetts Water Pollution Response Team, with Captain Lynn Hein, USCG designated as the Federal On-Scene Coordinator. The subject for discussion was what to do about the ARGO MERCHANT's lost sunken bow section which was believed to still contain an unknown quantity of oil. Four alternatives were presented for action after the bow was relocated: (1) bomb the bow in a way chosen by the Department of Defense, (2) use selective spot demolition, (3) hot-tap the oil, or (4) let nature take its course. After lengthy discussion and consideration of available environmental information, the RRT's recommendation to the

National Response Team was to bomb the bow section. A target date of 1 February was established. John Robinson volunteered to attempt obtaining a NOAA C-130 for a long overflight before the event.

Once the bow section was found, examination by the Atlantic Strike Team divers revealed that weather conditions had been so rough the previously intact tanks had been torn apart and the oil was released naturally.

Wednesday we had an organizational meeting that lasted much of the day. Basic strategy had to be laid out in such a way that areas of responsibility could be assigned and objectives could be reached. I was put in charge of the overflight program. This duty consisted of insuring continued overflights of the ARGO MERCHANT wreck site and tracking of the oil slick (it appeared the overflight program was being phased out) and keeping records of who went up, type aircraft utilized, flight path followed, when they went up, weather conditions, type of observations made (photographs, visual mapping, etc.), and results.

Thursday, I went on a 6½ hour NOAA C-130 overflight. NOAA pilot Howard Ticknor flew the "Albatross" between 700 and 850 feet over the wreck site. No part of the wreck was visible and only a few small oil "pancakes" were sighted.

Friday we flew back to Colorado and briefed the rest of the MESA Program Office on the state of ARGO affairs. Conflicting opinions on questions of jurisdiction and authority during the phase down of the SOR team operations and the commencement of the MESA long-term effects program caused communication problems, hard feelings, and, in some cases, conflicting requests and duplication of efforts.

WEEK OF JANUARY 16 - 21

Sunday, a smaller group went to Falmouth to continue MESA's long-term effects work. On Monday, after an organizational meeting, we received a call from the Office of the Governor of the State of Massachusetts requesting continuation of the overflight program. I called Captain Hein who assured me that the CG was planning to continue flying, weather permitting, until no more oil was spotted. Every other day a helicopter would fly ten miles seaward toward Nantucket over the ARGO wreck site, and every fourth day they would map the northwest portion of the oil forecast area. I set up an overflight reporting form (Appendix B) and began compiling data from previous overflights. I also started recording the daily position updates of the NOAA oil slick drifting buoy transmitted via satellite.

Wednesday, John Robinson, Larry Gratt (Science Applications, Inc., LaJolla), and I met with Dr. Robert Frosch on the Woods Hole Oceanographic Institution Quisett campus. We discussed Woods Hole's involvement in long-term oil effects studies. In the afternoon, the fate of the ARGO MERCHANT bow section was the subject of a public hearing conducted by Captain Hein, USCG, in conjunction with the office of Senator Edward W. Brooke at the Lawrence School in Falmouth. After short informative talks by Captain Hein, LCDR Barry Chambers, Commander Morgan, Mr. John Robinson, and Captain Folger, and the reading of statements from Senators Brooke and Kennedy, the floor was open to the public. About seventeen persons representing various interest groups made statements. A short question and answer period followed.

Thursday and Friday I attended meetings at the University of Rhode Island in Narragansett. Thursday was the first meeting of the "Interagency Coordination Group". This group, composed of representatives from NOAA/ERL/MESA, National Marine Fisheries Service, Bureau of Land Management, U.S. Coast Guard, Environmental Protection Agency, and the Executive Office of Massachusetts Environmental Affairs, established a set of action items in reference to the ARGO MERCHANT. On Friday, a group of sixteen reviewed Dr. Eva Hoffman's R/V ENDEAVOR cruise plan and sampling scheme, and alternate strategies were discussed.

WEEK OF JANUARY 24 - 28

Monday morning, John Robinson and I met with a small group of scientists in Dr. Dean Horn's office at Massachusetts Institute of Technology. We discussed the status of their oil trajectory models and weathering studies and encouraged continuation of the work under varied conditions. Possible topics for future studies and plans for workshops on these subjects were also considered.

Tuesday morning I contacted the Oceanographic Unit of the Coast Guard for flight maps, oil tracking charts, and Buoy Transmit Terminal (BTT) buoy positions. In the afternoon I accompanied Ms. Barbara Morson (Science Applications, Inc., Boulder) to the Sandwich Fish Hatchery to check the number and species of the dead oiled birds turned in.

Wednesday I flew to Washington, D.C. to organize a National Aeronautics and Space Administration (NASA) overflight and attend some NOAA/Coast Guard meetings on cooperation and coordination during oil spill response. Thursday morning eighteen representatives from NOAA Public Affairs, the Coast Guard Research and Development Center, and various factions

of NOAA's Environmental Research Laboratories and Environmental Data Service (EDS) met to organize NOAA's response to other oil spills. This meeting was valuable in smoothing out problems that had been of concern in the ARGO MERCHANT follow-up.

The afternoon meeting included several NASA and Coast Guard representatives in addition to those from NOAA. We went over the ARGO progress to date and planned the strategy for a NASA C-54 overflight: (1) fly over the wreck site, (2) pass over Eddy J (the trajectory model showed there was a possibility of oil being in Eddy J of the Gulf Stream), and (3) continue northeast as far as fuel and weather permitted toward the area of the last satellite positioning of the NOAA drifting buoy. I was to coordinate the agencies in preparation of this overflight and my major contacts were Peter Gross (NOAA/EDS/CEEDA) (Center for Experiment Design and Data Analysis), Mr. Robert Mairs (NOAA/NESS) (National Environmental Satellite Service), Commander Morgan (USCG), Dr. John Mugler (NASA-Langley) and Dr. Roger Navarro (NASA-Wallops). I delivered a letter requesting the NASA overflight to Dr. Jerome Rosenber, (NASA), at Federal Office Building 10. The request was granted late Friday evening.

Friday morning a NOAA/Coast Guard SOR team meeting was held. Slides of the ARGO rescue and break-up were shown, and NOAA/Coast Guard interaction was discussed. After the meeting, I went to Commander Morgan's office in the Navy Yard for oil slick maps, navigation charts, and buoy headings.

WEEK OF JANUARY 31 - FEBRUARY 4

Monday I finalized plans for the NASA overflight scheduled for Tuesday. Rough weather conditions and heavy cloud cover postponed the flight. Rather than waiting for the overflight in Washington, D.C., I flew back to Massachusetts to help out on the BEAUCHARD oil spill which had occurred in Buzzard's Bay over the weekend.

My major concern and responsibility remained making certain that everything went smoothly with the NASA overflight. Therefore, my first week of work on the Buzzard's Bay spill was supplying logistical support including renting a Winnebago trailer to serve as our field operations headquarters at Wing's Neck, Massachusetts.

I kept in touch with all my contacts in Washington and the overflight left Wallops NASA flight facility at 0700 Thursday. They followed the planned flight path, took seventy photographs at the wreck site, and proceeded to Eddy J. The infrared scanner was run over the eddy, but no oil was sighted. Surface conditions deteriorated as they flew east and the mission was aborted before getting within range of the NOAA drifting buoy.

WEEK-END OF FEBRUARY 5 - 6

Work continued through the weekend. On Saturday Herald Huber (ARCTEC, Bethesda) and I joined Rusty Johnson (USCG, Pacific Strike Team) and Don Smith (USCG, Atlantic Strike Team) in testing and evaluating the Pacific Strike Team's oil skimmer on the Cape Cod canal under rough weather conditions and heavy ice coverage. A tug pulled us against a very strong current as we worked during a bitter cold and windy snow storm.

Everything seemed to be in order so we headed in. Plans were made for me to take water samples the next day as they took the skimmer up the canal. The next day, to avoid running against the current, Rusty Johnson took the skimmer up the canal ahead of schedule. Since I had missed the skimmer, Don Smith arranged for a Coast Guard 44' cutter to take me out to sample. Using a Niskin butterfly sampler, I took surface and water column samples at 4 stations. Some evidence of oil was present on the surface of the canal almost as far as the ocean.

WEEK OF FEBRUARY 7 - 13

Response to the Buzzard's Bay spill was more organized and, therefore, more efficiently handled than the ARGO MERCHANT, but the need for a definite and outlined action plan was very evident. Briefing meetings for all involved were held each evening. The days events were reported and plans for the following day's activities were finalized. This provided a mechanism for flexibility. However, lack of an organized plan still allowed some unnecessary spending of money and wasted sampling efforts due to improper handling of samples. Also, since no funds were earmarked for oil effects research, difficulties arose concerning contracting out necessary work.

We began closing down Falmouth headquarters and only a few more sampling operations were planned. Benjamin Baxter (Science Applications, Boulder), Barbara Morson, Jack Carlile (NOAA/EDS/CEDDA), and I went aboard a Corps of Engineers tug to take water column samples along the canal.

A warming spell made the ice thin and sampling dangerous. Thursday, Benjamin Baxter, Paul Deslauriers (ARTEC, Bethesda), and I started a

sampling trip using an agency helicopter. Equipment problems made sampling at only the first station, Buttermilk Bay, possible and the rest of the trip had to be aborted. Later in the afternoon, when I got back to Wing's Neck, I accompanied Peter Kosterich (ARCTEC, Bethesda) out on the ice to take core samples from the largest oil pool.

Saturday, I made an overflight of the Buzzard's Bay area, the canal, and out over the ocean shore. A warm spell had caused large portions of the oiled ice and snow to break off the big masses and head out to the ocean via the canal. Enroute the ice chunks had begun melting and the canal showed about 80% oil slick coverage. Oil was also slightly visible in some of the small estuaries. On Sunday, I flew back to Boulder.

WEEK OF FEBRUARY 14 - 18

February 14th marked the beginning of the second phase of my internship - that of working with the Program Office staff by providing a synthesis/coordination/liaison function for MESA in developing the Puget Sound Project Development Plan (PDP), the basic long-range planning document for the MESA Puget Sound Project. This function included establishing project goals and objectives, research priorities, schedules and milestones, and tentative resource allocations.

Duty commenced with a trip to LaJolla, California with Dr. Edward P. Myers (Program Office liaison to the Puget Sound Project) to meet with Mr. Edward R. Long, Mr. Ronald P. Kopenski, and LCDR Raymond W. Reilly of the Project Office and Science Applications, Inc. (SAI), a firm under contract to MESA, to help finalize the PDP. We spent most of the week at the SAI facility working on Project goals and objectives, work units, and technical questions.

Friday, Edward Myers and I drove to Redondo Beach for a day of meetings and discussions at TRW, another contractor. Dr. Lee L. Peterson gave a presentation of the work TRW was doing at the San Onofre Nuclear Generating Station (SONGS), Dr. W. Vincent Neisius presented the Data Base Management System being developed and used at TRW, and Dennis B. Townsend demonstrated this system. In the afternoon we discussed the SALSIM (Systems Analysis Language for Simulation) approach to modeling, met with Mr. Robert Douglass to talk about areas of future possible MESA-TRW interaction, and had a brief tour of the ocean science laboratory.

WEEK OF FEBRUARY 21 - 25

Monday, Washington's Birthday, was a federal holiday and Edward Myers and I returned to Boulder, Colorado. On Tuesday we debriefed the staff on the California trip and plans were made for a short trip to the Puget Sound Project Office in Seattle, Washington to continue work on the PDP.

Before leaving, I compared the MESA New York Bight PDP to the MESA Management PDP. In order to avoid repetition in these documents, sections in the New York Bight PDP that made reference to Program Office responsibilities were deleted because they were covered in the MESA Management PDP.

Early Wednesday morning Dr. Herbert C. Curl, Jr., and I flew to Seattle and met with Edward Long from the Puget Sound staff and Ms. Monica Dussman of SAI for two days. We were concerned primarily with the PDP format and the work units.

On Friday I returned to the Oregon State University campus in Corvallis, Oregon to confer with my major professor, Dr. Victor T. Neal, on the progress of my internship and to take care of some graduate school business.

WEEK OF FEBRUARY 28 - MARCH 4

Upon returning to Boulder, travel was restricted and much of the week was utilized to get Travel Vouchers for my oil spill follow-up trips, and La Jolla, California and Seattle, Washington trips in order. Good experience was gained in itemization and accounting for time and travel during this period. I also spent some time during the week going through the New York Bight PDP for consistency - charts, tables, milestones and schedules, products and text.

WEEK OF MARCH 7 - 11

This week was devoted almost entirely to the New York Bight PDP. I continued reviewing for consistency and also developed a flow chart for research priorities. Although I was to be involved primarily with the development of the Puget Sound PDP, working on the one for the New York Bight gave me background experience for the Puget Sound work. On Thursday, I went to an Oceanography class at the University of Colorado to hear Herbert Curl's lecture on "Productivity in the Oceans".

WEEK OF MARCH 14 - 18

Monday morning we had a staff meeting to discuss the NOAA "freeze" and RIF (Reduction-in-Force) situation, to revise the MESA Program Office Events/Milestone calendar, and to make plans for the Puget Sound Task Development Workshop to be held in Seattle.

The rest of the week was devoted to Critical Review Team (CRT) meetings for the three MESA Projects: New York Bight Project; Puget Sound Project; and Deep Ocean Mining Environmental Study (DOMES). A CRT is made up of in-house (i.e., NOAA) technical representatives for review of the PDP. The New York Bight CRT met Monday afternoon and

all day Tuesday, the Puget Sound CRT (Appendix C) met all Wednesday and Thursday morning, and the DOMES CRT met Thursday afternoon and Friday. During each session, the various PDP's were reviewed, page by page, for problem areas: information gaps, inconsistencies, rationale errors, wording and definition problems, conceptual errors, etc. On the whole, I feel that these meetings went very smoothly and constructive comments were made.

After the Puget Sound CRT adjourned, a smaller group of CRT members got together and totally revised the goal strategy. This was not the first time the strategy had changed and during my internship with MESA it was not the last. These very real problems come up time and time again during the formulation of a working document for a project.

WEEK OF MARCH 21 - 25

Annual leave Monday and Tuesday.

Wednesday I began planning for the Puget Sound PDP Workshop. This was a workshop where outside technical consultants from different fields reviewed the PDP. I called several conference facilities in the Seattle area for dates available, costs, and amenities offered. Several factors were considered in deciding which place to hold the workshop: cost, the ability of the desired participants to attend on the dates available, accessibility to out-of-town participants, and the facilities available. The Battelle Conference Center near the University of Washington was chosen for May 26 and 27.

Friday, I was back in the oil business and participated in discussions with members of the MESA Program Office Staff and Dr. Wilmot N. Hess in reference to a proposed \$1.2 million for ARGO MERCHANT oil spill studies.

WEEK OF MARCH 28 - APRIL 1

This week was one of several staff meetings. The biggest issue of concern was Ocean dumping at Dumpsite 106. Since the National Ocean Survey (NOS) was doing a baseline study of Dumpsite 106, it was decided several more ERL/NOS meetings were necessary in order to enable the New York Bight Project to design an improved research strategy for the continuation of ocean dumping studies. It was determined that NOAA should address questions such as, "If ocean dumping is to occur, what is the best way to do it (single source, spreading, etc)" and that decisions as to whether or not ocean dumping should occur should be left to the Environmental Protection Agency. As for Dumpsite 106, NOAA's position was not to dump at 106 until additional baseline information showed the site to be feasible for dumping. If dumping was necessary, it could continue at the present site in the New York Bight.

I drafted a memo to Dr. Donald Martineau, Deputy Associate Administrator for Marine Resources, on the subject for the minutes of the January 20 first meeting of the "Interagency Coordination Group" at the University of Rhode Island in Narragansett. I also worked with Elwyn "Bud" Rolofson, a co-op student from METRO in Denver, on strategy for choosing MESA Project areas.

WEEK OF APRIL 4 - 8

Annual leave Monday through Thursday.

Since several of the technical consultants for the PDP Workshop were involved in research outside the Puget Sound area, a background paper of the region was to be provided to give the participants some familiarity with the vicinity before they reviewed the PDP. Therefore, Friday I devoted to reading available literature to enable me to write

a draft of this summary.

WEEK OF APRIL 11 - 15

The Puget Sound summary paper kept me busy this week. I set up a rough outline and started compiling essential information, figures, tables, and graphs from several sources. By the end of the week I had almost completed the first draft.

Budgeting was a major activity in the Program Office this week. I helped gather information and develop the rationale for MESA's Fiscal Year 1979 Zero-Base Budgeting initiative for submission to the Director of the Environmental Research Laboratories, Dr. Wilmot N. Hess. This initiative was then routed to the Office of Management and Budget (OMB) through NOAA and the Department of Commerce budget documents.

WEEK OF APRIL 18 - 22

I finished the first draft of the Puget Sound summary paper and had it typed. After making a few corrections, I gave it to Edward Myers for editorial review and the writing of the Executive Summary. The rest of the week I worked with him in revising the draft.

WEEK OF APRIL 25 - 29

The first three days of this week were spent taking care of loose ends in the office and getting ready to transfer. Wednesday was my last day in the Program Office and Thursday morning I left Boulder for a change of duty station to Seattle, Washington with the MESA Puget Sound Project Office.

WEEK OF MAY 2 - 6

Monday morning I reported to the MESA Puget Sound Project Office (Appendix A) at the Sand Point Naval Base Tower Building. I talked with the Project Manager, Dr. Howard S. Harris, about my internship, we set up a list of action items for me to work on, and he gave me a "Cook's Tour" of the building. After meeting Ms. Billie Barb and Ms. Barbara Olsen, and renewing my acquaintance with the rest of the Project staff, I organized my desk and got down to work.

We had a staff meeting to organize a management strategy for beginning a Monograph Series of the Puget Sound region. Points to be included and cost figures were decided for a draft Request for Proposals (RFP).

I continued to function as the MESA coordinator for the Puget Sound PDP Workshop setting up the conditions for the contract with Battelle, and sending out a letter, tentative schedule, and conference area map to the participants.

During an informal staff discussion on public relations for the MESA Puget Sound Project, the general consensus was that although local knowledge of the Project's activities would be both valuable and supportive, the Project Office, as now staffed, could not afford the time necessary to make such a program effective. Concern for the finalization of the PDP took precedence. Perhaps later a "PR" drive would be feasible.

WEEK OF MAY 9 -13

The Project staff spent a majority of the week preparing comments on the latest draft of the PDP for the upcoming technical workshop. Pre-workshop comments on the PDP were received from Dr. Grant Gross, Director, Chesapeake Bay Institute, The John Hopkins University.

The Puget Sound background paper arrived from Boulder for final

editing. All of the Project staff reviewed and made comments on the paper and I sent it back to Edward Myers in the Program Office for distribution.

I wrote a memorandum to Mr. Joseph Krieg in the Program Office with suggestions for the MESA Publications Policy.

Thursday, Dr. Seelye Martin showed me some of the oceanographic laboratory research facilities at the University of Washington. After listening to a seminar on the "Circulation of the Deep Water in the North Atlantic" by Dr. Val Wellington, Woods Hole Oceanographic Institute, I went aboard the University's R/V THOMPSON to look around. Crew members were preparing for a long cruise scheduled to leave in a few days.

One lunchtime, Howard Harris, Edward Long, and I talked about possible job opportunities after my internship. They made several suggestions and offered to help in any way they could.

WEEK OF MAY 16 - 20

This week I verified addresses, telephone numbers, and costs and availability of information from organizations for a NOAA Products and Services Catalog for the Puget Sound area. This Catalog, sponsored by the MESA Puget Sound Project, was part of the Project's environmental information dissemination effort.

I sent a memorandum to Mr. Birger Andersen of Science Applications, Inc., LaJolla, California, with a list of the Puget Sound PDP Workshop participants so copies of the PDP could be sent to them directly.

Tuesday and Wednesday I went out in the field with Edward Long and Raymond Reilly to help Charles Simenstad conduct his quarterly beach seining sampling for nearshore fish. The first day we took two surface tows

at Burrow's Bay sampling station and the next day, at the West Beach sampling station, we took two surface and two bottom tows. This was a part of a research project funded by the MESA Puget Sound Project to document the seasonal structure and prey resources of nearshore fish communities occurring in different distinct habitats in order to provide a measure of annual variability in nearshore fish community and food web relationships.

Thursday afternoon I took the bus to Corvallis, Oregon so I could be on the Oregon State University campus Friday to meet with some of my graduate professors and set up my Master's orals.

WEEK OF MAY 23 - 27

Monday morning I gave a seminar to the OSU Agriculture Economics graduate level Natural Resources Policy class on "Oil in Puget Sound". This was my first formal seminar and it proved a valuable experience. The class was very responsive, thus good questions and comments were made following the talk.

Back in the office on Tuesday, I completed my Travel Voucher and made certain that all the arrangements for the PDP Workshop were in order. A few last minute cancellations made only minor changes necessary.

Wednesday, Herbert Curl and Edward Myers met with the Project Office staff to plan how the Workshop would be conducted. Because there were only five outside technical consultants attending, it was decided to keep them in one working group. Also, the Program and Project participants, after initial brief introductions, were to serve primarily as sources of information, letting the consultants lead the discussion and comments. (Appendix D).

The Battelle Conference Center was conducive to idea formulation for the PDP Workshop, chaired by Dr. Grant Gross, on Thursday and Friday. It ran fairly smoothly and on time. Unfortunately, considering the time, effort, and money expended, the output was not as productive and constructive as it could and should have been.

WEEK OF MAY 30 - JUNE 3

Monday, May 30, was a federal holiday.

Tuesday, I edited and reviewed a technical report of an intertidal/subtidal benthos baseline study. A staff meeting was held to discuss the previous week's Workshop PDP recommendations and what course of action the Project Office should follow. It was decided that each of us would write up our comments and submit them to Raymond Reilly for compilation. Howard Harris and Edward Long went to Boulder the next week to work with the Program Office staff to incorporate the recommendations in the "final" draft of the PDP.

June 1-3 were spent on board the M/V SNOW GOOSE as an observer and part of the scientific crew for a MESA funded plankton baseline study. Jerry D. Larrance, Alexander J. Chester, and Patricia A. Ruffio of the Pacific Marine Environmental Laboratory (PMEL) led the sampling at nine stations to assess the seasonal distribution of zooplankton and phytoplankton in the Strait of Juan de Fuca. Heavy seas precluded sampling on the first day. However, all work was completed the second day and the SNOW GOOSE returned to Seattle on schedule Friday.

Week of June 6 - 10

Out on sick leave part of Monday, and all of Tuesday and Thursday.

Illness interrupted my activities at the office this week, but I did review and compile other's comments on the "United States - Canadian Cooperative Marine Research, Northern Puget Sound, Straits of Juan de Fuca and Georgia Development Plan." I also proofed the final typing of the intertidal/subtidal benthos report.

Week of June 13 - 17

Monday I was out on sick leave.

Tuesday I was briefed on the events in Boulder during the previous week's work on the finalization of the PDP. I reviewed the interim report on "Trophic Relationships of Nearshore Fish at Selected Sites along the Strait of Juan de Fuca" for Edward Long. On Wednesday, some of the Project staff met with the principal investigators for that research program to discuss problems encountered in and comments made on the report.

The Project staff also met with several PMEL principal investigators, (Baker, Cline, Damkaer, and Larrance), to discuss the status of ongoing studies, ideas of continuing and/or changing present projects, and new interest areas. The meeting was productive with a good exchange of thoughts.

Later, we had a group discussion on the subject of bringing oil into the Puget Sound. Assuming the decision had been made, we discussed what type of oil related research we would want to fund and where this research should occur.

Week of June 20 - 24

Some time was devoted to working on my Position Description, Standard Form-171, and Federal Register application. I met with Howard Harris several times to go over these forms.

I saw the movie, "DOMES: Phase 1, Environmental Baseline," in the office of Dr. Robert Burns, DOMES Project Manager.

A status report on various Project activities underway and planned was presented during a staff meeting. Also, deadline dates for certain action items were set or modified.

Thursday, Dr. Glenn Cannon (PMEL) presented a seminar to representatives from agencies concerned with wastewater disposal in the Puget Sound central basin. Dr. Cannon's analysis of current and water property data collected through September 1976 seemed to suggest that the flushing of the central basin may be much faster than the flushing suggested by classical estuarine dynamics. Additional research is presently being conducted to further elucidate the major factors governing flushing.

Week of June 27 - July 1

Monday, Lieutenant Commander Jimmy Lyons, NOAA, joined our staff for a three month sojourn during recess from full-time assignment at the Institute for Marine Studies, University of Washington. A staff meeting was held to brief him on the MESA Puget Sound Project and designate responsibility for various Project milestone activities.

Since the draft galley of the NOAA Products and Services Catalog was ready for review, I went through it making some minor corrections.

The "final" draft of the Puget Sound PDP arrived from Science Applications, Inc. The staff reexamined the document and found the basic philosophy of

the Project again changed. It was evident that the ideas of the Program and Project Offices were still in conflict and the PDP was not acceptable to either.

Week of July 4 - 8

The Fourth of July was a federal holiday.

The Project was bustling with activity as the staff rewrote numerous sections of the final PDP. I worked principally on rewriting the rationale for Goal B: Determine the effects of critical environmental stress within the Puget Sound ecological systems. Printing deadlines made time of the essence. Problems with the telecopier machine made it necessary to have the twenty-one pages of revisions sent to the Program Office by plane Wednesday afternoon.

Thursday was Howard Harris' last day before taking annual leave, so the staff went over a MESA Puget Sound Project Action Items schedule. Priorities, completion dates, and lead responsibilities were determined for nineteen items. Additionally, I determined how to have the Project's mailing lists computerized and the compilation of names and addresses was begun.

Week of July 11 - 15

This week was spent writing "fact sheets" for the various MESA Puget Sound Project sponsored research programs: intertidal/subtidal work, nearshore fish baseline, hydrocarbon baseline, physical oceanography, plankton baselines, suspended sediment and petroleum distribution, water quality, modelling, and microbial degradation studies. Each sheet was two to four pages long and included: the purpose of the study, the principal investigators, the history of the work done to date and scheduled, a

description of the methods and equipment employed, a map showing the sampling sites, and where the preliminary and/or final results could be obtained. These "fact sheets" were used as a part of the MESA Puget Sound Project's information dissemination effort.

Week of July 18 - 22

I worked on the "fact sheets" this week. The final galley of the NOAA Products and Services Catalog for Puget Sound came in. Final corrections were made and the OK for printing was given.

Week of July 25 - 29

Monday and Tuesday I wrote more of the "fact sheets." Tuesday afternoon I took the bus to Corvallis to make final preparations for my Master's oral examination on Thursday.

COMMENTS

Comments will be included at the expiration of my internship

APPENDIX A
MESA PROGRAM OFFICE

Dr. J. Frank Hebard, Director
Dr. Louis W. Butler
Dr. Herbert C. Curl, Jr.
Dr. John C. Emerick
Mr. Joseph J. Krieg
Dr. Edward P. Myers
Ms. Joan D. Myers
Dr. George Peter
Mr. John H. Robinson

Lieutenant Chris Carty, NOAA

Ms. Isabel C. Baros
Ms. Colleen H. McAvoy

Ms. Joan Foster, CO-OP Student
Mr. Kevin M. O'Donnell, CO-OP Student
Mr. Elwyn "Bud" Rolofson, CO-OP Student

MESA PUGET SOUND PROJECT OFFICE

Dr. Howard S. Harris, Project Manager
Mr. Ronald P. Kopenski
Mr. Edward R. Long

Lieutenant Commander Jimmy A. Lyons, NOAA
Lieutenant Commander Raymond W. Reilly, NOAA

Ms. Billie C. Barb
Ms. Barbara R. Olsen

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APPENDIX C

PUGET SOUND PROJECT CRITICAL REVIEW TEAM

Birger Andersen	Science Applications, Inc. (SAI), LaJolla
Joseph Angelovic	NOAA/Marine Resources, Rockville
Katherine S. Baker	NOAA/ERL/MESA
Louis Butler	NOAA/ERL/MESA, Boulder
Chris Carty	NOAA/ERL/MESA, Boulder
Herbert Curl	NOAA/ERL/MESA, Boulder
Monica Dussman	SAI, LaJolla
Howard Harris	NOAA/ERL/MESA Puget Sound, Seattle
Frank Hebard	NOAA/ERL/MESA, Boulder
Kent Hughes	NOAA/EDS, Georgetown
Neva Karrick	NOAA/Northwest and Alaska Fisheries Center
Edward R. Long	NOAA/ERL/MESA Puget Sound, Seattle
Edward P. Myers	NOAA/ERL/MESA, Boulder
Charles R. Muirhead	NOAA/National Ocean Survey, Rockville
Fred Rigby	SAI, LaJolla
Herald Stanford	
Catherine Warsh	NOAA/National Ocean Survey, Rockville

APPENDIX D

PUGET SOUND PROJECT DEVELOPMENT PLAN WORKSHOP PARTICIPANTS

OUTSIDE PARTICIPANTS

Dr. Joseph Angelovic, Director
Marine Environmental Protection Office
National Oceanic and Atmospheric Administration

Dr. Norman Brooks, Director
Environmental Quality Laboratory
California Institute of Technology

Dr. Thomas Church
College of Marine Studies
University of Delaware

Dr. Grant Gross, Director
Chesapeake Bay Institute
The Johns Hopkins University

Dr. Allen P. Michael
University of Massachusetts

Dr. Michael Waldichuk
Pacific Environment Institute
West Vancouver, B.C.

SCIENCE APPLICATIONS, INC. PARTICIPANTS

Mr. Birger Andersen

Mrs. Monica Dussman

MESA PROGRAM OFFICE

Dr. Herbert C. Curl, Jr.

Dr. Edward P. Myers

MESA PUGET SOUND PROJECT

Dr. Howard S. Harris

Miss Katherine S. Baker

Mr. Ronald P. Kopenski

Mr. Edward R. Long

LCDR Raymond W. Reilly