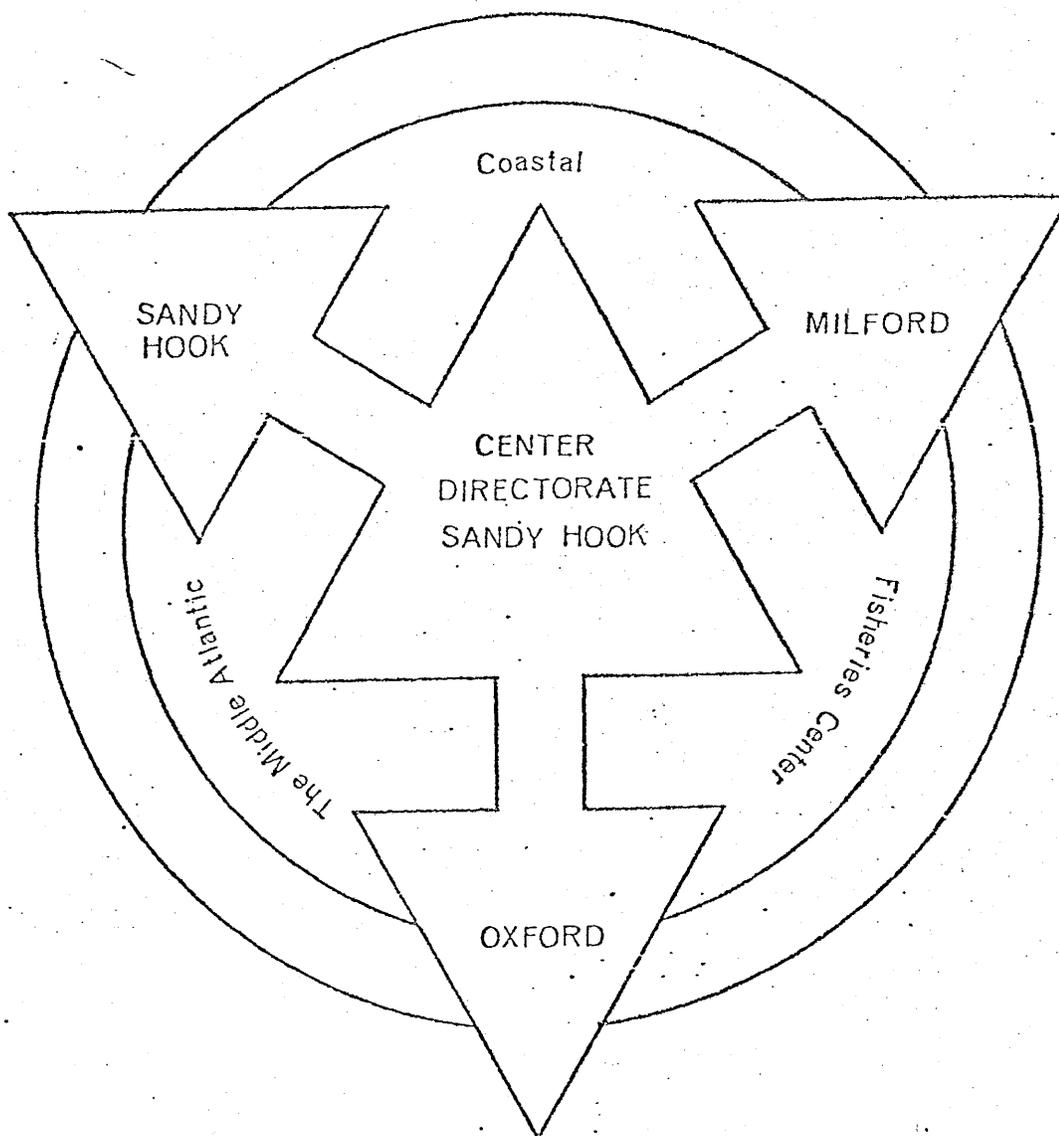




PROPOSAL FOR FY 1976 MESA-NYB FUNDING:
"ABNORMALITIES IN FISH AND SHELLFISH WHICH MAY BE
ASSOCIATED WITH OCEAN DUMPING"

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Region

MIDDLE ATLANTIC COASTAL FISHERIES CENTER



Informal Report No. 71

July 14, 1975

Research Proposal

Submitted by

Middle Atlantic Coastal Fisheries Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration

to

MESA-New York Bight Program Manager
Marine Ecosystems Analysis Program
Environmental Research Laboratories
National Oceanic and Atmospheric Administration

for support of studies on:

ABNORMALITIES IN FISH AND SHELLFISH WHICH MAY BE
ASSOCIATED WITH OCEAN DUMPING

Total Amount Requested: \$95,000.00

Date: July 14, 1975

Approved by: _____
Principal Investigator
(301) 226-5193

Carl J. Sindermann
Director, Middle Atlantic Coastal Fisheries Center

WORK UNIT TITLE:

ABNORMALITIES IN FISH AND SHELLFISH WHICH MAY BE
ASSOCIATED WITH OCEAN DUMPING

A PROPOSAL TO MESA-NEW YORK BIGHT PROJECT OFFICE

Recent studies by the Middle Atlantic Coastal Fisheries Center have disclosed significantly higher incidences and prevalences of "fin-rot" disease conditions in winter flounder from the apex of the New York Bight than from areas outside of the apex. These observations, although important in themselves, pose additional questions for which we propose to find answers. In addition, we have consistently observed so-called "black gill" disease in crustaceans from the apex. This observation also suggests further investigation.

A. Fin-rot Disease

Induction

Background:

Based on the higher prevalence of fin rot disease in winter flounder (Pseudopleuronectes americanus) from the New York Bight apex, it has been hypothesized that some biologic or abiotic factors within the apex initiate the disease. We propose to conduct field and laboratory studies to determine whether the degraded areas of the apex can induce fin rot disease in winter and summer flounder (Paralichthys dentatus).

Research Plan for FY 1976:

1. Entrapment studies with winter flounder in sewage sludge area
 - a. Holding traps of appropriate size (5 x 4 x 2 feet) will be constructed for placement within the sewage sludge area of the New York Bight apex (coordinates provided by NOAA-AOML; 40°26.0'N, 73°47.5'W) and a control area on the south shore of eastern Long Island.
 - b. Buoys provided by the MESA project office to locate submerged fish traps will be rigged for placement in the Bight apex and the control area.
 - c. Long lines containing 2-3 cages with 5-10 winter flounder in each cage measuring no greater than 20 cm (2+ years) will be placed in the designated sludge area and control area for from 1-4 weeks during the summer, fall, and winter of FY 76.

- d. At the time of retrieval of the traps, the winter flounder will be examined for the presence of fin rot. Tissues from diseased fish will be fixed for histopathologic examination. The traps will be replenished with additional fish and returned to the selected sewage sludge site.
 - e. Water temperature, salinity, and a bottom sediment sample will be obtained each time the traps are placed at the sewage sludge site.
2. Fin rot incidence in summer flounder from Sandy Hook Bay and Great Bay, N. J.
 - a. Monthly trawl cruises to Sandy Hook Bay utilizing R/V Delaware II, R/V Xiphias, and R/V Rorqual will be conducted from July-November of FY 76 to determine the incidence of fin rot disease in summer flounder.
 - b. Monthly trawl cruises to Great Bay, N. J., utilizing charter vessels will be conducted from July-November of FY 76 to determine the incidence of fin rot disease in summer flounder.
 - c. Data will be examined statistically to determine if the incidence of fin rot disease in summer flounder (from July-November) is higher in Sandy Hook Bay than Great Bay.
 - d. A trawl cruise utilizing the R/V Delaware II will be conducted during November offshore at 60 fathoms to determine fin rot disease prevalence in summer flounder which have summered in the New York Bight apex.

Specific Products:

1. Trimester reports (3) will be submitted during the 12-month course of the study.
2. Results of observations will be prepared for scientific publication within six months following completion of the study.

Progression and Contagion

Background:

It presently is not known conclusively whether lesions of flounder with fin rot disease ultimately resolve or progress causing the death of the animal, or whether disease can be transmitted from fish to fish. We propose to conduct laboratory studies to determine disease progression and contagion.

Research Plan for FY 1976:

1. Histologic and cytologic studies of normal and fin rot flounder epidermis

- a. Fin and somatic epidermis of two flounder species in which fin rot disease is prevalent (winter, summer flounder) and one in which the disease is very rarely observed (windowpane flounder, Scophthalmus aquosus) will be examined cytologically and histologically.
 - b. Five-ten fish of each species of flounder will be sacrificed and tissues removed for histologic and cytologic study.
 - c. The thickness and structure of the epidermis and the number of mucus cells will be determined employing stains such as H & E, PAS, and Mallory trichrome.
 - d. Selected epidermal tissues will be examined with transmission and electron microscopy. The normal epidermis and the epidermis of fish with fin rot will be described.
2. Fin rot disease progression in laboratory-held winter and summer flounder
- a. Four large, 4 x 4 foot, fibreglassed plywood aquaria will be constructed for holding winter and summer flounder in the laboratory.
 - b. Periodic collections of winter and summer flounder with acute fin rot disease will be made in Sandy Hook/Raritan Bay during the summer of FY 76.
 - c. Diseased fish (one fish/aquarium) will be placed in aquaria containing sand bottom and provided with running seawater.
 - d. All fish will be examined daily for disease progression and/or mortality and periodically photographed.
 - e. Selected fish tissues will be removed and fixed for histopathologic examination.
3. Contagion in laboratory-held winter and summer flounder
- a. Four apparently healthy and one fin rot diseased winter or summer flounders will be placed in a 4 x 4 aquarium with a sand bottom and provided with running seawater. Three other similar aquaria will contain 3 and 2, 2 and 3, and 1 and 4 healthy and disease (respectively) flounders.
 - b. All fish will be examined daily to determine if previously healthy flounders contract fin rot disease.
 - c. Selected fish tissues will be removed and fixed for histopathologic examination.

4. Fin rot disease in pelagic fish from pound and Fyke nets in Sandy Hook/Raritan Bay
 - a. Commercial landings of pelagic fishes will be examined for fin rot disease dockside at the Belfort, N. J., Fisherman's Cooperative.
 - b. Appropriate subsamples of the commercial catch will be examined during the spring, summer, and fall fishing season.
 - c. Fin rot disease prevalence will be collated by season, species, and trap location.

Specific Products:

1. Trimester reports (3) will be submitted during the 12-month course of the study.
2. Results of observations will be prepared for scientific publication within six months following completion of the study.

B. Invertebrate Disease

Background:

In addition to fin rot in demersal finfish, a number of abnormalities have been observed in crustaceans of the New York Bight. Exoskeletal erosion in lobsters and shrimps has been observed and reported. More recently a syndrome known as "black gill disease" has been observed in crabs of the Bight apex. Because this may prove to be an important factor in crab mortalities, a study of the syndrome is warranted.

Research Plan for FY 1976:

1. Periodic cruises (to augment collections made to date) to obtain crabs (*C. irroratus*) will be made to predetermined sample locations in the New York Bight. Prevalences of black gill disease will be determined and histology of normal and diseased animals will be described. These observations should last for a period of at least one year.
2. Parasites and epibionts associated with black gill disease in selected crustacean species will be examined. Prevalence data and descriptions of fauna associated with black gill disease will be made.

Specific Products:

1. Trimester reports (3) will be submitted during the 12-month course of the study.
2. Results of observations will be prepared for scientific publication within six months following completion of the study.

BUDGET SUMMARY

PATHOBIOLOGY INVESTIGATIONS

Fiscal Year 1976; MESA: Abnormalities in Fish and Shellfish Associated with Coastal Pollution

A. Fish Abnormalities: Etiology, Contraction time and survival periods of fin rot infected fishes

<u>Name & Position</u>	<u>Grade</u>	<u>% of Time</u>	<u>Man-months</u>	<u>MESA Funds</u>
Dr. A. Rosenfield, Dir. of Invest.	GS-14	5	0.6	1.8
Dr. R. Murchelano, Invest. Chief	-13	25	3.8	7.3
Dr. J. Bodammer, Electron Micros.	-11	15	1.8	2.8
Ms. J. Wade, Electron Microsc. Tech.	-07	10	1.2	1.3
Mr. J. Ziskowski, Fish. Biol.	-09	100	12.0	12.8
Ms. S. MacLean, Fish. Biol.	-07	40	4.8	4.3
Student Trainees (2)	-03	75	16.0	12.0
Total Personal Services: Fin rot studies:				<u>42.3</u>

B. Shellfish Abnormalities: Prevalence, symptoms, and etiology of "black gill" disease in crustaceans

Dr. R. Murchelano	-13	10	1.6	2.9
Dr. J. Bodammer, Electron Micros.	-11	10	1.6	1.9
Dr. T. Sawyer, Parasitologist	-13	25	3.0	7.8
Ms. D. Wright, Histological Tech.	-05	20	2.4	2.2
Student Trainee	-03	25	4.0	2.0
Total Personal Services: "Black Gill" Studies:				<u>16.8</u>

Overtime: Scientific field parties				<u>3.5</u>
Total All Personal Services:				<u>62.6</u>
Travel				2.0
Transportation of Things				1.0
Printing and Reproduction				0.3
Computer Services				2.0
Contracts				---
Technical Services				---
Capital Equipment				---
Supplies and Expendables				4.1
Total Direct Costs:				<u>72.0</u>
Support (33.3% of total direct cost):				<u>23.0</u>
Total of all costs				<u>95.0</u>