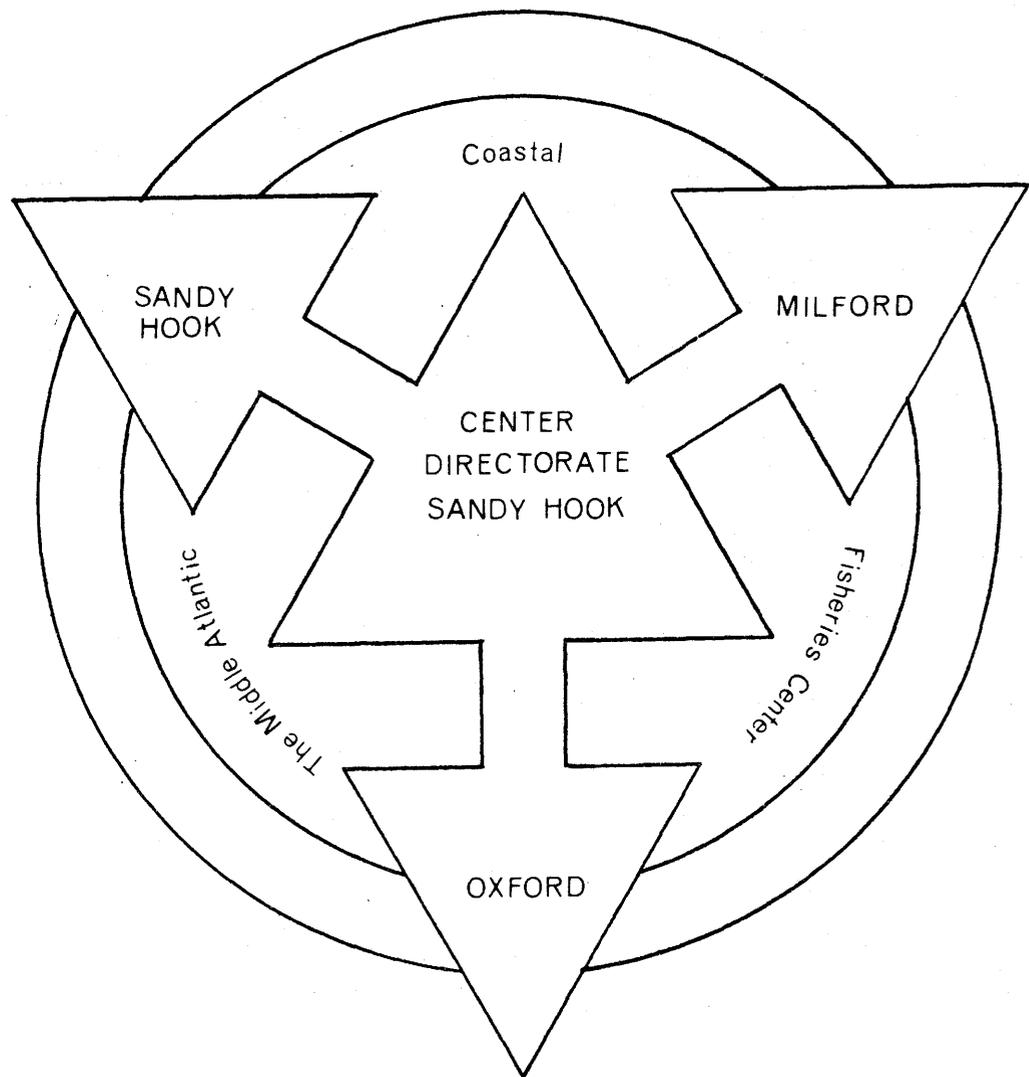


A PROPOSAL FOR REESTABLISHMENT OF AQUACULTURE RESEARCH AT THE
MIDDLE ATLANTIC COASTAL FISHERIES CENTER IN FY 1975



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

MIDDLE ATLANTIC COASTAL FISHERIES CENTER



Informal Report No. 34
August, 1974



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Middle Atlantic Coastal Fisheries Center
Highlands, New Jersey 07732

Date : August 28, 1974

Reply to Attn. of: F16

To : FNE - Russell T. Norris
Regional Director, Gloucester, Mass. 01930

From : Carl J. Sindermann
Center Director, MACFC, Highlands, New Jersey 07732

Subject: Revised proposal for Re-entry of this Center into Aquaculture R. & D.

Subject proposal (3 copies) is enclosed for your consideration. It provides, per our phone conversation of August 23, for reprogramming of an annualized rate of \$250K, beginning January 1, 1975, from our Experimental Biology funding.

The proposal is submitted with the assumption that this Center will receive base funds in FY 1975 at the same level as FY 1974, and with the expectation that new aquaculture funds may be available in FY 1976.

The reprogramming does not indicate that we consider the pollution - related experimental work now being conducted at Milford to be unimportant, but rather that re-entry into aquaculture seems most responsive to industry needs at this time, within the confines of the limited funds available.

The proposal is submitted to you with the request that the Region provide one ceiling for an added genetics position. The genetics work is the heart of our program, and we cannot do it adequately with one-half time of Dr. Longwell.

FOREWORD

This document contains a plan to reestablish molluscan aquaculture research and development as part of the activities of the Middle Atlantic Coastal Fisheries Center. It attempts to respond to a stated industry need by initial reprogramming existing funds in the second half of FY 1975 (January to June 1975) with the expectation of additional funds in FY 1976.

A PROPOSAL FOR REESTABLISHMENT OF
AQUACULTURE RESEARCH AT THE
MIDDLE ATLANTIC COASTAL FISHERIES CENTER

May, 1974

I. BACKGROUND INFORMATION RELEVANT TO THE PROPOSED REESTABLISHMENT OF
AQUACULTURE R&D AS A MAJOR PROGRAM AREA OF THE MIDDLE ATLANTIC
COASTAL FISHERIES CENTER

Two facilities of the Middle Atlantic Coastal Fisheries Center, Milford and Oxford, have a long history of involvement in molluscan aquaculture. Much of the basic biological information now used by oyster hatcheries on Long Island and elsewhere was developed at Milford over a period of three decades. The new physical plant at Milford was designed as an experimental molluscan hatchery. Raft and pond culture methods for oysters were explored at Oxford, and major oyster disease research has been centered there.

Because of an OMB policy, enunciated in 1970, of reduced programs of direct industry support, the research at Milford was drastically re-oriented at that time toward studies of the effects of marine contaminants on marine organisms. This contaminant-oriented research has been productive and is expected to continue, since problems concerned with effects of ocean pollution of resource species and on aquaculture are increasing. Much of the expertise in aquaculture research which existed at Milford and Oxford still exists, since many pollution related problems are close to those in aquaculture, and since disease problems in aquaculture are similar in many ways to those in natural populations. It should be noted too that some of the stocks of oysters isolated several years ago for genetic selection studies have been maintained and are still available.

Several recent events have suggested that greater attention should be focused by NMFS on molluscan aquaculture. A nationwide aquaculture survey by the Mardela Corporation (1972) identified disease, genetics, and nutrition as significant needs in molluscan and other aquaculture. Then in 1973 the Shellfish Institute of North America passed a resolution encouraging the reestablishment of molluscan aquaculture at the Milford

facility. A representative group from that Institute met in October 1973 and identified disease control as an immediate need, and genetic and nutrition studies as long-term needs. These events combine to indicate that this may be a propitious time to reestablish aquaculture as a major program area of the Middle Atlantic Coastal Fisheries Center. The following sections outline how this might be accomplished within realistic funding and staffing limitations. A more detailed proposal will be prepared as needed, particularly for FY 1976 efforts, but it should be possible to begin some efforts in FY 1975, as outlined below:

II. RESPONSE IN FY 1975, WITH NO NEW FUNDS OR STAFF

As a response to stated industry needs for the second half of FY 1975 (Jan. 1, 1975 to July 1, 1975) we propose to reprogram on-going effort into four aquaculture areas: genetics, disease control, spawning and rearing, and nutrition. This initial reprogramming in FY 1975 would be done with the expectation that the reprogrammed amount would be augmented by funds from NMFS anticipated FY 1976 increase for aquaculture R&D and that new positions would accompany the increase.

It should be noted that the ongoing and planned contaminant research of the Center is important, and that the reprogramming efforts indicated in this and the following sections represent the extent to which the contaminant-related work can be reduced. It should also be noted that this reprogramming proposal assumes no further reductions in base funding of the Center. If further reductions occur (below the FY 1974 level) then reprogrammed funds must also be reduced.

We have submitted to NMFS Task Development Plans for FY 1976 showing reprogramming in the second half of FY 1975 into Molluscan Aquaculture. The amount of reprogrammed money will be annualized in FY 1976, when it will augment the \$300K requested for Molluscan Aquaculture as specified in the FY 1976 Program Emphasis Document. The amount of reprogramming would be \$125K for the second half of FY 1975, annualized in FY 1976 to \$250K.

For the second half of FY 1975 reprogrammed funds for Aquaculture would be as follows:

\$30K from "Contaminant Effects on Algae" 2818P6 to
"Nutrition of Shellfish" (MAC057)
(Total FY'74 funding for this task is \$60.7K)

\$25K from "Mutagenesis" 2818P7 to
"Genetics of Shellfish" (MAC056)
(Total FY'74 funding for this task is \$64.7K)

\$70K from "Rearing of Indicator Organisms" 2818P5 to
"Spawning and Rearing of Shellfish" (MAC058)
(Total FY'74 funding for this task is \$151.4K)

This would amount to a fund reprogramming for the last 6 months of FY'75 of \$125K -- or an annualized amount of \$250K.

Since total FY 1974 funds for Experimental Biology at Milford were \$431.6K, this proposal represents a reprogramming effort of almost two thirds of available funds (exclusive of support, and assuming level funding in FY'75). Remaining contaminant-related studies would be: Physiological Effects of Contaminants, \$154.8K; Mutagenesis, \$14.7K; and Rearing Indicator Organisms, \$11.4K.

III. RESPONSE IN FY 1976, WITH REPROGRAMMED CENTER FUNDS, HOPEFULLY AUGMENTED BY NEW FUNDS AND STAFF (AS SUGGESTED BY THE FY 1976 BUDGET AT ITS PRESENT STAGE OF DEVELOPMENT).

The proportion of reprogrammed Center funds indicated for FY 1975 would be continued in FY 1976. Total reprogrammed funds for FY 1976 would be \$250K.

Additionally in FY 1976, \$300K is requested as part of the proposed Aquaculture funding increase to augment the reprogrammed amount of \$250K in the following areas:

	FY'76	FY'76	FY'76
	<u>Reprogrammed</u>	<u>Increase</u>	<u>Totals</u>
MAC-057(Nutrition)	\$60K	\$ 45.5K	\$105.5K
MAC-056(Genetics)	50	102.3	152.3
MAC-058(Control of Disease)	45	83.2	128.2
MAC-059(Spawning&Rearing)	<u>95</u>	<u>69.0</u>	<u>164.0</u>
Totals	\$250.0K	\$300.0K	\$550.0K

New positions would be expected with the new funds.

In the event that the \$300K increase does not materialize in FY'76, the program would continue at the \$250K level, with no implementation of the experimental hatchery operations.

Emphasis will initially be placed on molluscan genetics, disease control, and nutrition, and much of the program will provide for more effective utilization of the physical plants at Milford, and at Oxford as well. It should be emphasized, however, that there are other aspects of aquaculture that are included in the long-range plans of the Center. These include, but are not limited to grow-out systems for mollusks in natural waters, genetics of aquaculture animals other than mollusks (crustaceans and fishes), and disease of aquaculture animals other than mollusks, and diseases of all life history stages of marine animals.

GUIDELINES FOR PROGRAM REORIENTATION RESULTING FROM PROPOSED REPROGRAMMING
FOR AQUACULTURE

1. We do not plan to reduce contaminant related research at Milford beyond the actions outlined in previous sections. Thus a significant research effort will continue on experimental studies of contaminant effects on resource species and some work will continue on mutagenesis.

2. Aquaculture genetics will emphasize selective breeding of oysters; Aquaculture nutrition will concentrate on definition of algal nutrients for mollusks. The algology group will continue its service function of providing food for contaminants studies as well as to aquaculture studies.

3. Spawning and rearing for aquaculture will emphasize scallops with some attention to ocean quahogs and surf clams for contaminant studies; oysters and hard clam spawning will continue as a service function to contaminants and aquaculture.

4. Initial disease efforts in FY'75 will concentrate on establishment of a Reference Center and Registry of Marine Disease, preparation of a Manual on Diagnosis and Control of Marine Aquaculture Diseases, continuation of disease diagnostic services to U. S. aquaculture, establishment of a larval disease control group at Milford, and studies of water quality effects on marine animal health. Disease control efforts in FY '76, contingent on new funds and positions, will concentrate on expansion of the larval disease group at Milford, and improved preventative, diagnostic and trouble-shooting services.

5. Disease research of the Center will continue to be supervised by the Director, Pathobiology Investigations, regardless of where it is conducted. Larval disease studies will logically be conducted at Milford, by a group based there. Other aquaculture disease control efforts will remain at Oxford.

6. Existing Investigation groupings of the Center will encompass the initial reprogrammed aquaculture efforts in FY'75. Based on new funding for FY'76, a new major Investigations grouping --"Aquaculture"--may be created, or the action may be deferred until funding and staffing reach significant levels (possibly not until FY 1977).

7. Aquaculture funds will be assigned to the Director, Aquaculture Investigations, once that group is established. He will, in the case of larval disease studies, outline problems and indicate needs in discussion with Director, Pathobiology Investigations, and will reassign reasonable portions of new aquaculture funds to him for disease studies.

8. New subtask plans for January - July 1975, will be prepared as soon as this proposal is accepted.

PROBLEMS AND PRIORITIES IN MOLLUSCAN AQUACULTURE

1. Problems:

Lack of understanding of diseases and absence of methodology
for disease control

Lack of genetically selected and adapted
stocks

Lack of information on nutritional requirements and on chemically
defined artificial diets

Lack of information on the subtle influences of water quality
on growth and survival

Lack of suitable early grow-out components of culture
systems.

2. Priorities:

Species: Oysters, hard clams, scallops.

Research areas: genetics, disease control, nutrition
(natural and artificial diets), and water quality.