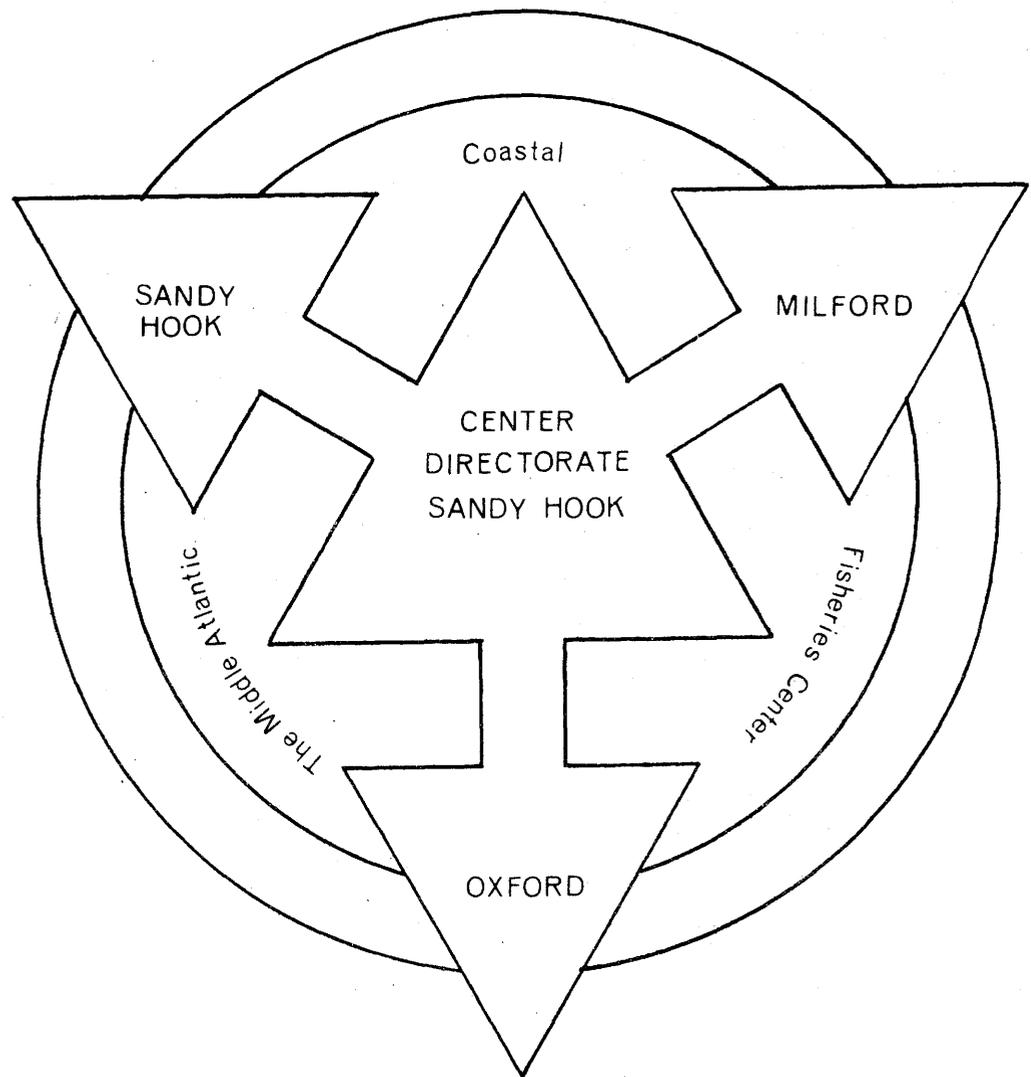


A PROPOSAL FOR REESTABLISHMENT OF AQUACULTURE RESEARCH AT THE
MIDDLE ATLANTIC COASTAL FISHERIES CENTER



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

MIDDLE ATLANTIC COASTAL FISHERIES CENTER



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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 reprogramming existing funds in the second half of FY 1975 (January to June 1975) with the expectation of additional funds in FY 1976.

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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 reoriented 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 on 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 ongoing effort into four aquaculture areas: genetics, disease control, spawning and rearing, and nutrition. We would propose to do this in FY 1975 only if there is reasonable expectation that the reprogrammed amount would be augmented by funds from NMFS anticipated FY 1976 increase for aquaculture R&D, and that 6 new positions would accompany the increase. If there is no such expectation, then we would prefer to delay any reprogramming action until the beginning of FY 1976 (July 1, 1975). Delay is not advisable, however, since we would not be responsive to immediate and expressed industry needs.

It should be noted also 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 will be reduced. It should also be noted that total Center funding for FY 1975 will be reduced approximately \$95K below FY 1974 total, which had been reduced by \$450K from the FY 1973 total.

We have submitted to NMFS Task Development Plans for FY 1975 showing reprogramming in the second half of FY 1975 of \$87.2K into Molluscan Aquaculture. This amount of reprogrammed money will be increased to \$174.4K in FY 1976, when it will augment the \$300K requested for Molluscan Aquaculture as specified in the FY 1976 Program Emphasis Document of this Center.

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

- \$16.8K from "Contaminant Effects on Algae" (MAC013) to "Nutrition of Shellfish" (MAC057)
(Total FY'74 funding for this task is \$46.5K)
- \$19.0K from "Mutagenesis" (MAC014) to "Genetics of Shellfish" (MAC056)
(Total FY'74 funding for this task is \$76.8K)
- \$21.6K from "Comparative Pathobiology" (MAC016) to "Control of Disease" (MAC058)
(Total FY'74 funding for this task is \$159.6K)
- \$29.8K from "Rearing of Indicator Organisms" (MAC012) to "Spawning and Rearing of Shellfish" (MAC059)
(Total FY'74 funding for this task is \$132K)

This would amount to a fund reprogramming for the last 6 months of FY'75 of \$87.2K -- or an annualized amount of \$174.4K.

III. RESPONSE IN FY 1976, WITH REPROGRAMMED CENTER FUNDS AUGMENTED BY NEW FUNDS AND STAFF

The proportion of reprogrammed Center funds indicated for FY 1975 would be continued in FY 1976. Total reprogrammed funds for FY 1976 would be \$174.4K.

Additionally in FY 1976, \$300K is requested as part of the proposed Aquaculture funding increase to augment the reprogrammed amount of \$174.4K in the following areas:

	<u>FY'76</u> <u>Reprogrammed</u>	<u>FY'76</u> <u>Increase</u>	<u>FY'76</u> <u>Total</u>
MAC-057 (Nutrition)	\$33.6K	\$ 45.5K	\$ 79.1K
MAC-056 (Genetics)	38.1	102.3	140.4
MAC-058 (Control of Disease)	43.2	83.2	126.4
MAC-059 (Spawning and Rearing)	<u>59.5</u>	<u>69.0</u>	<u>128.5</u>
Totals:	\$174.4	\$300.0	\$474.4

A minimum of six new positions would be expected in the new funds.

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, on mutagenesis, and on the effects of contaminants on phytoplankton.

2. Aquaculture genetics will emphasize selective breeding of oysters; Aquaculture nutrition will concentrate on 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 will continue with sea scallops, ocean quahogs, and surf clams; oysters and hard clam spawning will continue as a service function to contaminants and aquaculture.

4. Initial disease efforts in FY 1975 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 1976, contingent on new funds and positions, will concentrate on expansion of larval the larval disease group at Milford, and improved 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 1975. Based on new funding for FY 1976, 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.

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, bay scallops.

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