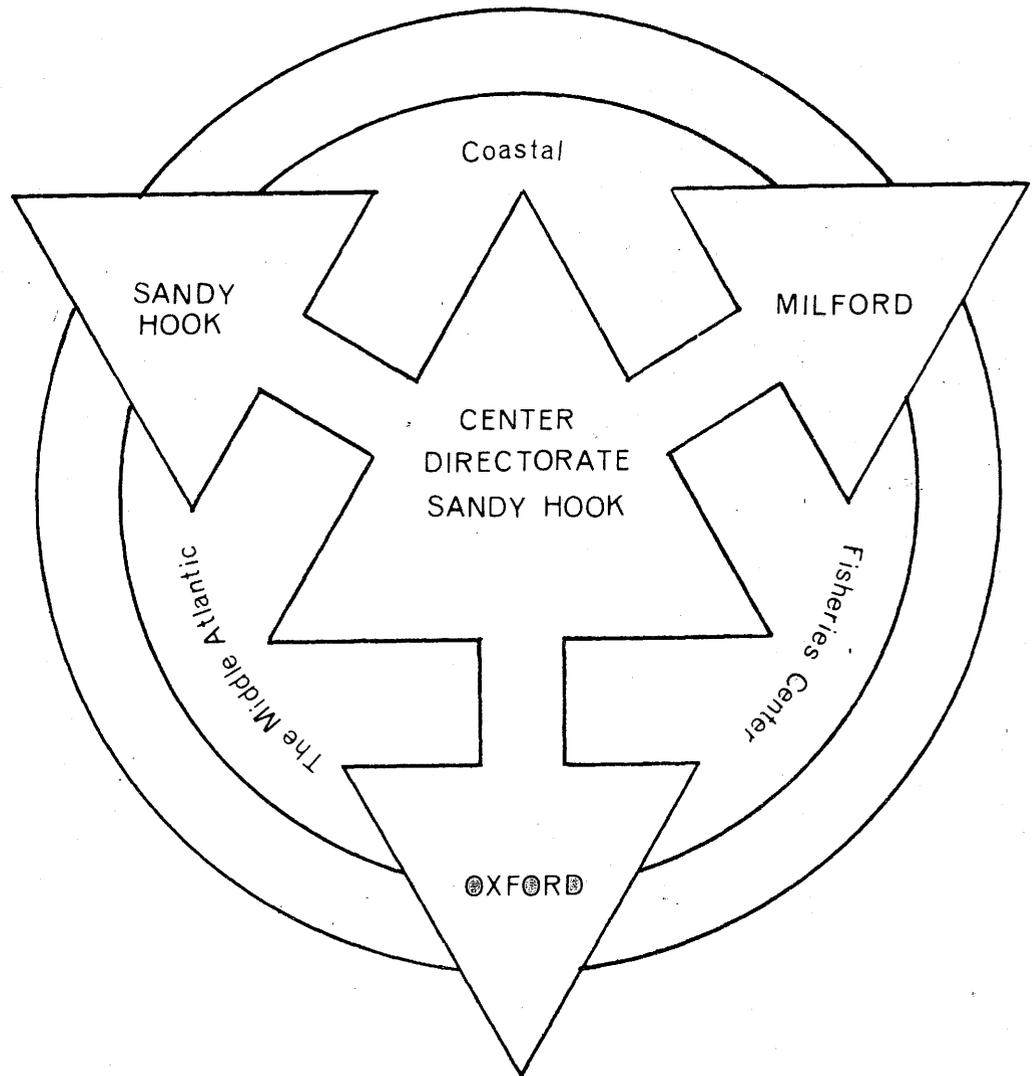




U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Northeast Region

MIDDLE ATLANTIC COASTAL FISHERIES CENTER



SUB-TASK PROGRESS REPORT - FY 1975

Informal Report No. 47

January 20, 1975

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3. REPORTING PERIOD  
First half 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-002-75-S2-A-1(01)

5. SUBTASK TITLE  
Groundfish Assessment: Autumn Cruise FY 75

NO. OF A/E	7. %	8. STATUS
1	100	Cruise planning and coordination completed on schedule.
2	95	Cruises completed on schedule. Some strata incompletely sampled.
3	80	Data processing on schedule.
4	20	Cooperative report on schedule.
5	05	Preliminary assessments begun; some delays encountered.

RESULTS 1. Planning and coordination included expanded coverage of Middle Atlantic off-shore (15-200 fm) areas. Expansion greatly increased workload. 2. Cruises completed on schedule. 166 stations occupied in Middle Atlantic area between 5 and 200 fms. on batross IV and Delaware II. Special samples and collections distributed. Vessel schedule constraints prevented total sampling in all coastal strata. Cruise report completed with some delays due to format reorganization. 3. Hand processing completed, cards punched and first initial audit corrected. Some auditing problems expected due to OP personnel changes which may cause delay in completion of final tape. 4. Cooperative ICFC-NEFC report based on fall survey data will be in MESA Atlas of New York Bight. Biomass estimates for Sciaenids caught on cruise now being calculated for report purposes.

OFFICIAL PREPARING REPORT (Signature) *Thomas H. Garovito*

FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) *Carl J. Sunde*

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4. TDP NO. PLUS STP SUFFIX  
MAC-002-75-S2-A-1(02)

5. SUBTASK TITLE  
Groundfish Assessment: Spring Cruise FY 75

NO. OF A/E	7. %	8. STATUS
1	50	Planning and coordination of cruise on schedule.
2	0	Cruise scheduled for 2nd half FY.
3	0	Data processing scheduled for 2nd half FY.
4	0	Cruise report scheduled for 2nd half FY.
5	0	Data analysis scheduled for 2nd half FY.

**RESULTS**  
Continued coverage of inshore and offshore Mid-Atlantic areas anticipated. Because of scheduled acoustic survey Sandy Hook will expand survey coverage to Georges Bank relieving NEFC personnel. Mid-Atlantic and Georges Bank survey scheduled on Albatross IV from March 4-28.  
Scheduled for 2nd half FY.  
Scheduled for 2nd half FY.  
Scheduled for 2nd half FY.  
Scheduled for 2nd half FY.

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*Thomas A. Garwood*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. [Signature]*

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4. TDP NO. PLUS STP SUFFIX

MAC-002-75-S2-A-1(03)

5. SUBTASK TITLE

Resource Assessment - Invertebrates

6. NO. OF A/E	7. %	8. STATUS
1	90	Distribution and abundance of surf clams Ms on schedule.
2	90	Distribution and abundance of ocean quahogs Ms on schedule.
3	75	Burrowing of <u>Spisula</u> Ms on schedule.
4	95	Atlantic coast surf clam fishery Ms on schedule.
5	75	Atlantic coast surf clam fishery Ms behind schedule.
6	25	Analysis of 5 years survey data on schedule.
7	10	Analysis of data tabulation of gametogenesis of surf clams on schedule.
8	60	Monthly hard clam cruises on schedule.
9	0	Raritan Bay hard clam report scheduled 2nd half FY.
0	60	Hard clam gametogenesis sample collection and preparation on schedule.
1	0	Analysis of hard clam gametogenesis scheduled for 2nd half FY.
2	100	Surf clam assessment cruise completed on schedule.
3	100	Surf clam cruise report completed on schedule.
4	50	State-Federal surf clam management continuing on schedule.
5	0	Sea scallop assessment cruise scheduled 2nd half FY.
6	0	Sea scallop cruise report scheduled 2nd half FY.
7	90	Sea anemone on oyster Ms on schedule.
8	60	Ecological significance of rock crab Ms on schedule.
9	50	Effects of quicklime on oyster seed Ms on schedule.

9. RESULTS

- 1-5. All clam manuscripts in various stages of review and revision.
- 6-11. Collection and analysis of surf clam and hard clam data for gametogenesis studies as well as historical surf clam survey data is on schedule as indicated above.
- 12-13. Surf clam cruises and reports were completed.
- 14. State-Federal surf clam management continuing.
- 15-16. See above.
- 17-19. Manuscripts in various stages of review.

10. OFFICIAL PREPARING REPORT (Signature)

*Samuel J. Christensen for John Popes*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Sunderman*

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3. REPORTING PERIOD  
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5. SUBTASK TITLE  
Historical Cruise Data - 18 Cruises (1968-1972) Between  
Florida and New York

NO. OF A/E	%	8. STATUS
1	100	Data analysis of summer trawl survey in Sandy Hook Bay, New Jersey completed on schedule.
2	100	Ms pertinent to Sandy Hook Bay data completed on schedule.
3	0	Feasibility studies of the application of recurrent group analysis of coastal cruise data not begun due to lack of ADP capability.
4	0	Recurrent group analysis will begin during fourth quarter if ADP capability is available.

**RESULTS**

- Final data analysis and graphics pertinent to trawl data collected in Sandy Hook Bay were completed during first quarter of FY 75.
- A Ms "Summer Benthic Fish Fauna of Sandy Hook Bay, N. J." has been completed and will be sent to NMFS editor as soon as final typing is completed.
- Recurrent group analysis feasibility studies have not been initiated due to the lack of ADP expertise at this time.
- Recurrent group analysis will begin during fourth quarter if ADP capabilities can be realized.

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MAC-002-75-S2-A-1 (05)

Status of Stocks (Species Briefing Books)

NO. OF A/E	7. %	8. STATUS
1	95	Data, including catch statistics and literature search completed for most briefing books.
2	90	Rough drafts of most briefing books submitted on schedule.
3	50	Updating of books continuing.
4	25	Editing of books on schedule.

**RESULTS**

- Work on some books delayed because of workload, cruise commitments. Some species assigned have been researched extensively and require a great deal of time for completion.
- Most books submitted on schedule, remaining to be submitted within a few weeks. Reason for delays same as above.
- Updating of books responsibility of individual authors; most will be updated.
- Books to be published will be determined in January.

OFFICIAL PREPARING REPORT (Signature) <i>Thomas R. Garout</i>	M. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) <i>Carl J. Sundermann</i>
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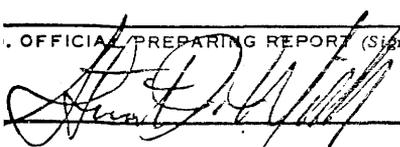
4. TDP NO. PLUS STP SUFFIX  
MAC-002-75-S1-A-1(06)

5. SUBTASK TITLE  
Historical and Ongoing Assessment of the Genus Paralichthys

NO. OF A/E	7. %	8. STATUS
1	100	Preliminary regression analysis and selection of variates completed.
2	0	Discriminant function analysis of summer, southern, Gulf and broad flounder will begin second half of FY 75 if ADP feasibilities are available.
3	0	Preparation of species diagnostic keys will begin during fourth quarter FY 75.
4	0	Identification of unit stocks will begin during fourth quarter of FY 75.

- RESULTS
- Regression analysis of 31 morphometric and meristic variates have been completed for some 1400 specimen.
  - Discriminant function analysis of the afore mentioned variates will begin as soon as ADP capabilities are available.
  - Not scheduled unit fourth quarter of FY 75.
  - Not scheduled unit fourth quarter of FY 75.

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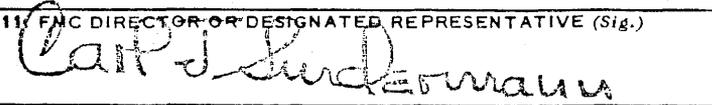
4. TDP NO. PLUS STP SUFFIX  
MAC-002-75-S2-A-1 (07)

5. SUBTASK TITLE  
Bluefish Monograph (Pomatomus saltatrix)

NO. OF A/E	7. %	8. STATUS
1	100	Morphometric analysis Ms submitted to editor.
2	75	Age and growth Ms partially reviewed and revised.
3	75	Food items Ms partially reviewed and revised.
4	75	Bibliography Ms partially reviewed and revised.
5	50	Migration Ms in rough draft form.
6	75	Egg and larval Ms partially reviewed and revised.
7	0	These activities not scheduled until fourth quarter FY 75.
8	0	These activities not scheduled until fourth quarter FY 75.
9	0	These activities not scheduled until fourth quarter FY 75.

RESULTS  
-6. Self explanatory in status section.  
-9. Activities not scheduled until fourth quarter of FY 75.

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4. TDP NO. PLUS STP SUFFIX  
MAC-002-75-S2-A-1(08)

5. SUBTASK TITLE  
Historical and Ongoing Assessment of the Family Sciaenidae

6. NO. OF A/E	7. %	8. STATUS
1	✓100	Collections made during all phases of fall groundfish surveys.
2	✓100	Port sampling at selected locations completed.
3	✓100	Initial processing of sciaenid life history materials ahead of schedule.
4	✓50	Reading of spot scales behind schedule.
5	0	Age and growth analysis of spot to begin second half of FY.
6	0	Analysis of weakfish scales scheduled to begin second half of FY.
7	✓100	Feasibility of discriminant function analysis of meristic and morphometric data for identification of spot unit stocks completed.
8	0	Discriminant function analysis of spot meristic and morphometric data scheduled to begin second half of FY 75.
9	50	Atlantic croaker fecundity study on schedule.
10	0	Spot fecundity study will begin second half of FY.

9. RESULTS  
1-3. Some 6,000 sciaenid specimens were collected during groundfish surveys and port samplings and initially processed. 4. Spot scale reading behind due to loss of personnel. 5. Not scheduled until second half of FY 75, will be delayed until all scales are read. 6. Will begin on schedule if qualified reader available. 7. Preliminary discriminant function analysis of spot variates exhibit a 90% separation of northern and southern groups. 8. Will begin if ADP facilities are functional. 9. Some 250-300 croaker gonads have been analyzed for numbers of eggs and ova diameters. 10. Not scheduled until second half of FY 75.

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4. TDP NO. PLUS STP SUFFIX  
MAC-002-75-S2-A-1 (09)

5. SUBTASK TITLE  
Groundfish Assessment - Monthly Survey

6. NO. OF A/E	7. %	8. STATUS
1	50	Planning and coordination of cruises on schedule.
2	50	Cruises completed and samples distributed on schedule.
3	45	Fishermen and cruise reports near completion.
4	50	Data processing on schedule.
5	0	Development of analysis program delayed.
6	0	Scheduled for second half FY 75.

9. RESULTS  
 1. Planning and coordination of cruises on schedule. Vessel schedule conflicts in March may necessitate some charter work and coverage may not be complete.  
 2. July thru November cruises completed. Special samples collected and distributed.  
 3. Fishermen and cruise reports essentially completed and ready for distribution.  
 4. Development of format and personnel restrictions caused some initial delay. No delays anticipated for calendar year 75 cruises.  
 5. Hand processing ahead of schedule; machine processing on schedule. Some delays anticipated this spring because of ADP personnel changes.  
 6. Development of analysis programs dependent on formation of population dynamics unit which has been delayed. Anticipated input from life history investigations will permit some assessments. 6. Not scheduled.

10. OFFICIAL PREPARING REPORT (Signature)  
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*Carl J. Suderbaum*

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4. TDP NO. PLUS STP SUFFIX  
MAC-002-75-S2-A-1(10)

5. SUBTASK TITLE  
Life History Aspects of Finfishes Found in the New York Bight

NO. OF A/E	7. %	8. STATUS
50		On schedule, samples have been collected on schedule during all phases of monthly groundfish cruises made in the New York Bight.
50		Processing of collected material is on schedule.
50		Semi-annual summary report on schedule for first half year of collections (June-Nov. '74).
0		Final report scheduled near end of FY 75.

RESULTS

- 2. Over 21,000 specimens have been collected and processed during the first half of FY 75.
- . A semi-annual summary report including length-frequency, length-weight, gonadal index, distribution, occurrence, and movements will be completed by the end of February 1975.
- . Activity not scheduled until last quarter of FY 75 and first two quarters of FY 76.

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4. TDP NO. PLUS STP SUFFIX  
MAC-002-75-S2-A-1 (11)

5. SUBTASK TITLE  
Juvenile Fish Distribution and Recruitment

5. NO. OF A/E	7. %	8. STATUS
1	50	Collections complete, on schedule; final listings of data thru spring 1974 ready - preliminary listings thru fall 1974 available.
2	0	Delay due to personnel problems.
3	0	Scheduled for second half of FY.
4	0	Scheduled for second half of FY.
5	0	Scheduled for second half of FY.
6	0	Scheduled for second half of FY.

9. RESULTS

1. Length frequencies of all fish taken on monthly and spring-fall coastal cruises available thru spring 1974 (verified and ready for analysis).
2. Priority of completing old assignments and establishing format for monthly cruise reports prevented analysis from beginning on schedule.

10. OFFICIAL PREPARING REPORT (Signature)

*Harvey A. Christensen*  
for *A. Pacheco*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Sunderman*

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4. TDP NO. PLUS STP SUFFIX  
MAC-005-75-FA-A-1 (01)

5. SUBTASK TITLE  
Biostatistics, Middle Atlantic Sportfish

NO. OF A/E	7. %	8. STATUS
1	50	Field survey at Ocean City on schedule.
2	50	Processing of preliminary 1-month trial complete. Four additional months available, on schedule.
3	0	Statistical testing of data scheduled for 2nd half of FY.
4	25	Semi-annual report on schedule.
5	0	Contract specification preparation scheduled for 2nd half FY.

RESULTS

- Aerial surveys, ground counts and interviews, biological observations completed and up to date.
- One months data being used to test program, remaining months being prepared for keypunch.

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for a Packco

NMFS DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Suderhman*

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4. TDP NO. PLUS STP SUFFIX  
MAC-005-75-FA-A-1(02)

5. SUBTASK TITLE  
Tilefish Fishery - Middle Atlantic Bight

NO. OF A/E	7. %	8. STATUS
1	100	Literature search completed on schedule.
2	100	Fishery vessel data completed on schedule.
3	50	Half-year collections on schedule.
4	50	Reference on hand; annotations begun somewhat delayed.
5	0	Ms scheduled for 2nd half of FY.

RESULTS

- Copies of all tilefish literature on hand (ca 80).
- Results of coastal interviews and reports of port sampling staff finished.
- Ca. 400 specimens sampled.
- Annotations begun on literature.

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*Henry J. Christensen*  
for A. Paskeo

FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Suderbaum*

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MAC-005-75-FA-A-1 (03)

5. SUBTASK TITLE  
Saltwater Fishing Contest Catches

NO. OF A/E	7. %	8. STATUS
1	10	Ahead of schedule. Some contest data already on hand.
2	0	Scheduled for 2nd half of FY.
3	0	Scheduled for 2nd half of FY.
4	0	Scheduled for 2nd half of FY.
5	0	Scheduled for 2nd half of FY.

RESULTS

- Communications being maintained with Schaeffer Tournament Committee.
- 5. Scheduled for 2nd half of FY.

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*Harold A. Christensen*  
for A. Pasico

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Suderbaum*

1. FISCAL YEAR  
1975

**NMFS SUBTASK PROGRESS REPORT**

(See Detailed Instructions)

2. DATE PREPARED  
January 1975

(Submit four copies.)  
TO: Director, National Marine  
Fisheries Service, ATTN: Fx5  
National Oceanic and  
Atmospheric Administration  
Washington, D.C. 20235

3. REPORTING PERIOD  
1st Half, 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-006-75-IE-A-1-01

5. SUBTASK TITLE  
Behavior of Fish Under Stress: Field Studies

NO. OF A/E	7. %	8. STATUS
1E	100	Manuscript completed and accepted for publication.
2A	30	Observation of winter flounder movements, activity and habitat selection - on schedule.
3A	0	Comparison of winter flounder, cunner and tautog movements to begin FY 76 - on schedule.
4A	20	Winter flounder feeding habits - on schedule.
5A	0	Feeding habit comparison: juvenile winter flounder, tautog and cunner to begin late FY 75.
6A	30	Winter flounder seasonal movements - on schedule.

**RESULTS**

- Olla, B. L., A. J. Bejda and A. D. Martin. "Activity, Movements and Feeding Behavior of the Cunner, Tautogolabrus adspersus and Comparison of Food Habits with Young Tautog, Tautoga onitis off Long Island, New York."
- Preliminary results employing sonic tracking indicate home range of winter flounder varies with season.
- Stomach analysis in progress.
- Observations still in progress.

OFFICIAL PREPARING REPORT (Signature) *John B. Pearce* 11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) *Carl J. Sunde*

John B. Pearce

1975

January 1975

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3. REPORTING PERIOD

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4. TDP NO. PLUS STP SUFFIX

MAC-006-75-IE-A-1-02

5. SUBTASK TITLE

Behavior of Fishes under Stress: Laboratory Studies

NO. OF A/E	7. %	8. STATUS
1A	45	Adult tautog activity and feeding - on schedule.
2A	45	Adult tautog shelter and territorial requirements - on schedule.
3A	0	Temperature effects on adult tautog - to begin on schedule.
4A	50	Adult weakfish activity and feeding - on schedule.
5A	0	Temperature effects on adult weakfish - to begin on schedule.
6E	0	Manuscript to be completed on schedule: "The Effect of Temperature on the Behavior of Young Tautog, <u>Tautoga onitis</u> ".
7A	15	Thermal stress effects on juvenile bluefish delayed by unavailability of healthy test fish.
8A	25	Mackerel data analysis FY 74 - on schedule.
9E	100	Manuscript published on schedule.

**RESULTS**

- Adult tautog are active and feeding during the day: quiescent and generally unresponsive at night.
- Adult tautog exhibit territorial behavior based on a dominant-subordinate relationship with a distinctly definable hierarchy established under normal environmental parameters.
- Preliminary results show a relationship between levels of activity and prey-species availability.
- Tests still in progress.
- Data analysis in progress.
- Olla, B. L. and C. Samet. 1974. Fish-to-fish Attraction and the Facilitation of Feeding Behavior as Mediated by Visual Stimuli in Striped Mullet, Mugil cephalus.

OFFICIAL PREPARING REPORT (Signature) *John B. Pearce*      FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) *Carl J. Suderhann*  
Bori L. Olla      John B. Pearce

9. Results (continued)

9. J. Fish. Res. Board Can. 31:1621-1630.

1. FISCAL YEAR  
1975

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3. REPORTING PERIOD  
1st Half, 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-007-75-IE-A-1-01

5. SUBTASK TITLE  
Impact of Environmental Change, Raritan Bay and Long Island  
Sound

NO. OF A/E	7. %	8. STATUS
1	75	Final report to EPA on stations surrounding NAD-EARLE USEPA Field Testing Station delayed due to ADP delays and New London monitoring survey duties.
2	75	Final report on Ambrose Channel stations on schedule.
3	75	Preparation and summation of total Raritan Bay data on schedule.
4	95	Report to New England River Basin Commission on environmental baselines in Long Island Sound still not submitted, due largely to typist shortage. Now expected by end of January.
5	5	Completion of first MS on benthic macrofauna of Long Island Sound may be delayed (ADP analysis behind schedule).

RESULTS

- Seasonal variability appears to emphasize the inherently unstable environmental conditions in Raritan Bay.
- Community composition is typical of an environment stressed by natural physical forces, i.e., low diversity and low standing crop.
- Recent multivariate analysis indicates more complex animal-sediment interactions than were previously recognized.
- Report describes water chemistry, sediment type and constituents, benthic meiofauna and macrofauna and relationships to environmental variables throughout LIS.
- Will discuss exceptions to some theories, such as trophic group amensalism and correlation of diversity to contamination in LIS.

OFFICIAL PREPARING REPORT (Signature) Robert Reid <i>John B. Pearce</i> John B. Pearce	ii. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) <i>Carl J. Suderwald</i>
--	--

1975

January 1975

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MAC-007-75-IE-A-1-02

Impact of Environmental Change, Deep Water Oil Exploration  
and Waste Disposal Sites

6. NO. OF A/E	7. %	8. STATUS
1	100	Mt. Mitchell cooperative cruise to establish sediment types and benthic faunal baselines completed on schedule.
2	8	Nine samples from above cruise sorted; identifications completed on four samples. Activity schedule based on hiring additional sorters through funding from BLM - will be much delayed if funds are not available
3	10	Central report not yet begun, but preliminary report presented at BLM conference on offshore activities and impacts.

9. RESULTS

1. Macrofauna samples collected from 93 stations, replicate grabs at 21 stations, water at 36 and heavy metal samples at 33 stations.
2. and 3. Samples to date appear similar to inshore areas in species richness and densities.

Robert Reid

*John B. Pearce*  
John B. Pearce

*Carl J. Suderbaum*

1. FISCAL YEAR  
1975

2. DATE PREPARED  
January 1975

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3. REPORTING PERIOD  
1st Half, 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-008-75-EI-A-1-01

5. SUBTASK TITLE  
Organically Bound Metal Effects on Biochemistry and  
Physiology of Crustacea

NO. OF A/E	7. %	8. STATUS
1	50	Grab gill enzyme system characterized and tests for effects of cadmium and lead completed (on schedule).
2	30	ATPase assays being carried out on gills from lobsters exposed, in vivo, to cadmium (on schedule).
3	0	Procedures developed for investigating effects of metals on amino acid metabolism (on schedule).
4	100	Larval rearing completed, tissue samples stored for tests.
5	30	ATPase assays being carried out on gills from lobsters exposed, in vivo, to cadmium (on schedule).
6	0	Equipment and procedures being prepared for work with shrimp (on schedule).
7	0	Investigations of organically bound metal effects on animals in planning stage. (expect to begin on schedule).
8	100	Manuscript completed (now in editing stage).
9	0	Draft of manuscript completed, ready for review (will be completed shortly, as soon as review process carried out).
10	0	Data being analyzed for manuscript on ATPase (expect to complete on schedule).

9. RESULTS  
Since the last report, enzyme studies showing significant effects of trace levels of cadmium and lead have been completed, rearing of Cancer irroratus larvae from egg through five zoeal stages to the megalopa has been carried out, methods and techniques for additional studies of metal and metal-organic effects on animals developed, and several manuscripts finished or in draft form.

10. OFFICIAL PREPARING REPORT (Signature)  
Robert K. Tucker  
*John B. Pearce*  
John B Pearce

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Sundermann*

1. FISCAL YEAR 1975
2. DATE PREPARED January 1975

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3. REPORTING PERIOD  
1st Half, 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-008-75-EI-A-1-02

5. SUBTASK TITLE  
Environmental Forms of Nutrients and Heavy Metals

NO. OF A/E	7. %	8. STATUS
1	75	Chemical analysis of nutrient samples completed for Long Island Sound Baseline Survey; data analysis in progress. (chemical analysis on schedule, data analysis may be late due to demand on computer facilities)
2	50	Polarographic analysis of metals continuing (on schedule).
3	0	Report anticipated on schedule.
4	50	Methods currently being developed for study of metal-organic interactions (on schedule).
5	0	Studies of interactions between metals and organics in planning state (on schedule).
6	0	First draft of manuscript on settling and diffusion of organics in marine environment complete and in editing state (on schedule).

RESULTS

This subtask has generated considerable data on nutrient composition and heavy metal concentrations in the marine environment since the last report. Data analysis is progressing and reports of these activities should be available shortly as scheduled.

10. OFFICIAL PREPARING REPORT (Signature) Robert K. Tucker	(Signature) John B. Pearce	11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) (Signature) Carl J. Luckenbach
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1975

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(See Detailed Instructions)

1/15/75

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TO: Director, National Marine  
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National Oceanic and  
Atmospheric Administration  
Washington, D.C. 20235

July 1 - December 31 - 1974

MAC-009-76-1EA(01)

Microbiol Ecology - Ocean Dumping

NO.  
OF  
/E

7. %

8. STATUS

- A 25 Two quarterly samplings of New London-Thames River completed and on schedule.
- A 25 Enumeration and isolation of bacteria complete. Characterization in progress.
- A 25 Sediments collected for chemical analysis, not completed.
- E 24 Informal Center Report for six months, draft completed.
  
- A 50 Collection of New York Bight collections of finrot and control areas done.
- A 50 Enumeration and isolation of bacteria completed, characterization in progress.
- E 50 Informal Report on finrot study being compiled.
- A 0 Chesapeake-Delaware sample collections projected for 4th quarter.

RESULTS

Fecal coliform range of 30-10,000/100 grams of sediments of New London Dumpsite indicate a degree of impact prior to dumping.  
Confirmed fecal coliforms show varying resistance to antibiotics.  
Methodology for quantitation of C. perfringens developed.  
Optimum recovery of marine Vibrios occurs at 20°C.

OFFICIAL PREPARING REPORT (Signature)

*John B. Pearce*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Sundermann*

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Washington, D.C. 20235

3. REPORTING PERIOD  
July 1 - December 31 - 1974

4. TDP NO. PLUS STP SUFFIX  
MAC-009-76-1EA(02)

5. SUBTASK TITLE  
Environmental Chemistry - Heavy metals

NO. OF /E	7. %	8. STATUS
A	50	<u>Long Island Sound Study</u>
E	50	Tracemetals in whelk and lobster from two dumpsites determined. Neutron activation analysis of water initiated.
A	50	First draft prepared and being reviewed in laboratory.
E	0	<u>New York Bight Study</u>
A	30	Food chain organisms will try to be collected in spring. Rough draft of two manuscripts prepared.
E	0	<u>Uptake and Clearance of Metals</u>
A	10	A. Striped bass were exposed to cadmium and frozen for future analysis.
E	10	B. Cunner were exposed to silver and frozen for future analysis.
A	10	C. Oysters held in laboratory, killed accidentally by hot water.
E	10	Oysters held off Guilford, Conn., were stolen.
A	60	Seven metals analyzed in 90% of surf clam samples. Arsenic and mercury analyses have not been started.
E	0	Scallops will be collected in the spring.
A	0	Delaware-Chesapeake Bay to be sampled in the spring.
E	0	
A	100	Special study (MESA Funded) tracemetal levels in sediments of New York Bight.

RESULTS

Levels of Ag, Cd, Cu, and Zn, in digestive diverticula of whelk and lobster were about 2-3 times greater for New Haven Dumpsite collected animals compared to animals obtained from New London Dumpsite.

Metal data thus far obtained shows no substantial difference in metal levels in surf clam as related to the geographic location of harvest.

Official Preparing Report (Signature)      U.S. FMC Director or Designated Representative (Sig.)  
*[Signature]*      *[Signature]*

NMFS SUBTASK PROGRESS REPORT  
(See Detailed Instructions)

January 10, 1975

MAC-012-75-IE-A-1(01)

(Submit four copies.)

July 1 - December 31, 1974

TO: Director, National Marine  
Fisheries Service, ATTN: Fx5  
National Oceanic and  
Atmospheric Administration  
Washington, D.C. 20235

Culture Methods for Coastal Molluscs

6	NO. OF SHEETS	7. %	8. STATUS
1	A	85	On schedule.
2	A	50	On schedule.
	A	25	Behind schedule. ✓
4	A	25	Behind schedule. ✓
	A	75	On schedule.

This Subtask terminated on December 31, 1974

RESULTS

- 1 A. Recent experiments confirm earlier data on optimum temperature range (20°-25°C) and salinity range (25-28 o/oo) for surf clam larvae culture in the laboratory. Value of chloramphenicol for control of larval disease confirmed.
- 2 A. Stimulation of rapid growth in newly-set surf clams not yet successful in the laboratory. Rapid growth of later-stage juvenile clams achieved in "grow-out" tanks with high flows of raw seawater.
- 3 A. Ripening of ocean quahogs in the laboratory possible from April to October. All attempts to spawn ripe ocean quahogs failed. Stripped gametes produced low fertilization and development levels.
- 4 A. Optimum temperature for egg development of ocean quahogs is 15°C. Optimum levels of environmental factors for growth of the larvae have not yet been determined.

(OVER)

*William S. Spudis* Investigation Chief  
*James S. Smith* Director of Investigations

*Carl S. Sundermann*

9. Results (contd)

5 A. Acceptable holding environment for bay scallops in the laboratory determined. Source of bay scallop stocks in the field changes with time; consequently, this aspect of this activity will be on-going indefinitely.

1. FISCAL YEAR	1975
2. DATE PREPARED	January 10, 1975
4. TDP NO. PLUS STP SUFFIX	MAC-012-75-IE-A-1(02)

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Washington, D.C. 20235

3. REPORTING PERIOD  
July 1 - December 31, 1974

5. SUBTASK TITLE  
Culture Methods for Marine Decapod Crustaceans

O. F. E.	7. %	8. STATUS
A	100	Completed.
A	60	On schedule; emphasis on blue crabs and lobsters.
A	50	On schedule for lobsters; behind schedule for blue crabs.
A	50	On schedule for lobsters; behind schedule for blue crabs.

This Subtask terminated on December 31, 1974

**RESULTS**

1 A. In addition to blue and rock crab stocks reported on in the last STPR, sources of breeding stocks of American lobsters also have been found.

2 A. Berried blue crabs from Chesapeake Bay unacceptable source of larvae due to complete mortalities in transit and subsequently. Local berried crabs hatched larvae readily in the laboratory. Berried lobsters from Mass. and Conn. produced excellent larvae in the laboratory. Out-of-season egg laying not accomplished in laboratory.

3 A. Lobster larvae reared in the laboratory with great success using standard techniques. Rearing attempts with blue crab larvae failed - cause unknown.

4 A. Juvenile lobsters reared successfully in the laboratory, early mortality from fungus disease controlled with antibiotic; large-scale brine shrimp rearing effort undertaken to provide high quality food for juvenile decapods.

OFFICIAL PREPARING REPORT (Signature) <i>James S. Anderson</i> Investigation Chief Director of Investigations	11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) <i>Carl P. J. Suderhann</i>
--	---

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3. REPORTING PERIOD  
July 1 - December 31, 1974

4. TDP NO. PLUS STP SUFFIX  
MAC-013-75-IE-A-1(01)

5. SUBTASK TITLE  
Experimental Effects of Pollutants on Phytoplankton

6. NO. OF A/E	7. %	8. STATUS
1 E	100	On schedule.
2 A	70	Partially on schedule.
3 A	100	On schedule.
4 A	60	Partially on schedule.

This Subtask terminated on December 31, 1974

RESULTS

1. An extensive array of data on the effect of selected organic compounds on phytoplankton growth has been tabulated and graphed and a manuscript is in preparation.
2. Experimental material on salinity response and adaptation was summarized and presented in seminar. Slowness of organism response to salinity variation precludes conclusion of activity up to the present time.
3. Experiments with alkali metals were directed at investigating toxicity levels and determining if organisms can tolerate a partial or total replacement of Na and K in the growth medium. In general, reactions to these substitutions varied between species but were similar in pattern between related groups of organisms. The replacement of K appears to be more readily acceptable than that of Na.

(OVER)

10. OFFICIAL PREPARING REPORT (Signature)  
*James S. Hunt*  
Investigation Chief  
Director of Investigations

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Suckerman*

#### Results (contd)

4. Experiments on the effects of the industrial pollutants, selenium and cadmium, were conducted. The growth-stimulating, as well as growth-inhibiting, potential of selenium was investigated; three selenium compounds were utilized. Toxicity levels of Cd were found for certain species.

The experiments in this subtask will be concluded and hence this report will constitute the final statement of the Contaminants report. The investigation will continue to work under an Aquaculture program and investigate the role of contaminants as they affect the culture of micro-algae as food organisms.

1975

NMFS SUBTASK PROGRESS REPORT

(See Detailed Instructions)

2. DATE PREPARED

January 10, 1975

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3. REPORTING PERIOD

July 1 - December 31, 1974

4. TDP NO. PLUS STP SUFFIX

MAC-013-75-IE-A-1(02)

5. SUBTASK TITLE

Methods of Cultivation of Phytoplankton

NO. OF A/E	7. %	8. STATUS
1 A	100	On schedule.
2 A	70	On schedule.
3 A	100	On schedule.
<p>This Subtask terminated on December 31, 1974</p>		

RESULTS

1. Subculture of 114 strains in the stock-culture collection was conducted on schedule of 3-, 4-, 6- or 8-week routines, each in several media. Special cultures in volumes of 25 ml, 500 ml and 1500 ml were maintained as inocula for the mass culture apparatus. Tests for contaminants were made on each subculture periodically; all strains in the collection are axenic with 6 exceptions. Skeletonema costatum was lost from the collection; replacement will be sought. Four strains were added to the collection, 3 bacterized strains were received from the Virginia Institute of Marine Science and one axenic culture was isolated by William Rose.

2. Investigations into novel methods of algal culture that will preserve long-term viability of strains are in progress. Refrigeration in the dark is very effective. We are experimenting with solid supports that are inexpensive, easily available, simple (OVER)

OFFICIAL PREPARING REPORT (Signature)

*James S. Park* Investigation Chief  
Director of Investigations

U. S. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Ruderman*

## Results (contd)

prepare, and have a potential for preserving a long-term viability of the algae. Certain species are growing very nicely on solid supports (other than agar). Various aspects of this technique are being explored.

3. Considerable effort was made towards purifying the bacterized strains in the collection. Numerous methods were used and success was achieved with Skeletonema statum (subsequently died), Rhodomonas sp. and a chlorophyte species. However, 6 strains still resist the most diligent attempts at purification.

Work of this subtask will be continued in the reprogramming to Aquaculture of this investigation. The methods of phytoplankton culture and the maintenance of good laboratory culture are essential to all investigations related to the aquatic marine environment.

1975

NMFS SUBTASK PROGRESS REPORT

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3. REPORTING PERIOD

July 1 - December 31, 1974

4. TDP NO. PLUS STP SUFFIX

MAC-013-75-IE-A-1(03)

5. SUBTASK TITLE

Mass Cultivation and Phytoplankton Food-chain Species

NO. OF A/E	7. %	8. STATUS
A	75	On schedule.
A	100 <sup>c</sup>	On schedule.
A	25	On schedule.
<p>This Subtask terminated on December 31, 1974</p>		

RESULTS

1. Numerous species were evaluated for mass culture purposes for which no information available; some proved extremely useful, e.g., Protococcus which produces very high densities rapidly.
2. The system of mass culture developed in this investigation (see Methods in Phycology, Ch. 4, by R. Ukeles) is yielding high density reliable algal cultures that are virtually contaminant free. Carboys containing continuous cultures need to be replaced infrequently; some have been in continuous culture for as long as 9 months. Cultures in carboys provided a total harvest of 1194 liters of larval foods and 1598 liters of juvenile foods at packed cell volumes of .009 ml/10 ml and .016 ml/10 ml, respectively. Open tank cultures of mixed algal cultures were maintained so that a continuous supply at 0 ml/min was delivered to trays of adult animals used in the Physiological Effects (OVER)

OFFICIAL PREPARING REPORT (Signature)

*James S. Hunt*  
Investigation Chief  
Director of Investigations

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Schuchman*

Results (contd)

Pollutant Stress and Rearing of Indicator Organisms investigations. This amounted a total harvest of 35,575 liters at an average packed cell volume of .007 ml/10 ml.

3. Some progress in the methods of harvesting and storing cultures was made but considerable work remains. Refrigeration appears to be useful for long-term storage. Gentle filtration for concentration of cells appears promising.

The work of this subtask will continue in the reprogramming of this investigation Aquaculture with an emphasis on the applicability of techniques to commercial aquaculture.

1. FISCAL YEAR  
1975

NMFS SUBTASK PROGRESS REPORT  
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July 1 - December 31, 1974

MAC-014-75-IE-A-1(01)

5. SUBTASK TITLE

Induction of Dominant Lethal Mutations in Commercial Oysters  
and Wild Mussels by Mutagenic Marine Contaminants

NO. OF /E	7. %	8. STATUS
1 A	100	Accomplished with <u>both</u> silver and cadmium contaminants.
2 A	20 <sup>0</sup>	Data being analyzed <u>ahead</u> of anticipated schedule.
3 A	100	Accomplished ahead of schedule.
4 A	100	Accomplished ahead of schedule.
<p>Status of the work reflects, as will future reports, the re-programming of 75% of the Genetics work back to Aquaculture</p>		

RESULTS

This subtask is intended to relate larval mortality following contaminant exposure of either adult or spawned eggs to induction of dominant lethal genes as detected by genetic test. This is being done for the first time for a commercial marine species, the American oyster, Crassostrea virginica. Genetic data on the larvae are yet to be fully analyzed. It is clear, however, that chronic exposure of adults to at least 0.1 ppm cadmium and to 0.5 to 4.5 ppb silver causes chromosome damage visible in developing zygotes. That damage can be transmitted through the male has been shown for cadmium. Dominant lethal genes in mammals at least are invariably linked to gross chromosome aberrations.

OFFICIAL PREPARING REPORT (Signature)

*Charles F. J. Quinn* Investigation Chief  
*James S. Dink* Director of Investigations

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*Carl J. Sunde*

1975

January 10, 1975

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MAC-014-75-IE-A-1(02)

TO: Director, National Marine Fisheries Service, ATTN: Fx5 National Oceanic and Atmospheric Administration Washington, D.C. 20235

Analysis Through Fertilized Egg-zygote Stages of Chromosome Damage Induced in Oysters and Clams by Mutagenic Marine Contaminant

NO. OF A/E	7. %	8. STATUS
2 E	100	Completed on schedule.
3 A	100	As scheduled.
4 A	100	Completed on schedule.
5 A	100	Completed on schedule.
7 A	100	Conducted as scheduled.
8 A	100	Conducted as scheduled.
1 A	30	Limited work done as scheduled.
12 A	5	On schedule.

Status of the work reflects, as will future reports, the re-programming of 75% of the Genetics work back to Aquaculture.

RESULTS

I. Experimental Work on the Mutation-inducing Effects of Heavy Metal Contaminants -

It was found that genetic damage done to the gametes of the commercial American oyster Crassostrea virginica, in one-hour separate exposure of eggs and sperm to the heavy metal contaminant, silver, could not be reversed by washing. From a high of 10.0 parts per million to 0.5 ppm the genetic apparatus of the eggs was near totally blocked, so meiosis could not be completed; hence, cleavage divisions could not begin. The chromatin threads of the blocked metaphase chromosomes were usually in some state of partial-to-near dissolution or pulverization.

The next lowest exposure tested after 0.5 ppm, 0.1 ppm, did not block division of chromosomes, allowed meiosis to proceed, and eggs commenced cleavage though behind (OVER)

*J. G. ...* Investigation Chief  
*J. G. ...* Director of Investigations

*Carl J. Suderbaum*

## 9. Results (contd)

schedule. Genetic abnormalities of the chromosomes and divisions were increased significantly above control values down to the lowest concentration tested in this manner, 0.0125 ppm.

In the second series of tests, again with the oyster, extending from 0.025 ppm or 25 parts per billion down to 0.5 ppb, fertilization was in the silver-added water without prior separate treatment of the gametes. Cleavage took place in the same water. There was significant genetic damage at all 8 concentrations tested. This included the low of 0.5 ppb, well below the  $LC_0$  value of 0.003 ppm for 2-day-old, straight-hinge larvae. There was no regular stepwise dose effect, but at 5.0 ppb there was an increase in mutations maintained at higher levels. At the low 0.5 ppb the number of eggs with any one or more of all the chromosome and division errors scored doubled, and the number of eggs with any one or more of the most severe of these effects tripled. The percentages of affected eggs were roughly 50 and 30, respectively.

Chronic exposure to silver, while the oysters are in the gonad primordial stage, increased the incidence of cyto-genetically detectable mutations in eggs subsequently developed in water without any added silver. This was at 5 exposure levels of 0.5 to 4.5 ppb in ozonized seawater for one month. Exposure to 0.5 ppb silver gave an effect not measurably different from the highest dose, 4.5 ppb.

With cadmium exposure of spawned oyster eggs starting at fertilization there was a distinct significant, persistent increase in the incidence of chromosome and division abnormalities above background starting at 0.25 ppm. Again, this is below the  $LC_0$  concentration for the 2-day-old, straight-hinge larvae, which is 1.0 ppm. Here too there appears to be no regular dose-effect but damage is increased starting at 3.8 ppb. At 0.125 ppm there might be an effect detectable on more trials. In the treated categories about half again as many eggs had cyto-genetic abnormalities as in the controls. When only the most severe such mutations were classified generally three times as many eggs had such mutation as did control eggs.

Chronic exposure to cadmium during oyster gametogenesis for two weeks at fractions of parts per million has severe chromosome breaking effects. These can be transmitted through the sperm alone.

Finally, added to this are the meiotic blocking effects of lead detected down to 0.25 ppm in the small wild clam, Mulinia.

Data on the mutagenicity of these metals are being organized for publication with only a small part of the experimental work yet to be completed. Also, the acute exposure data have to be treated statistically to put figures on the degree of significance. However, that there is a statistical significance is obvious on examining figures alone.

More work was conducted on acute exposure to spawned eggs than on chronic lower-dose exposure of adults. However, it appears that the latter - low-dose chronic exposure - leads eventually to the more severe genetic effect on the spawned developing eggs. This is important because this is more likely the type of exposure occurring most in nature.

## 9. Results (contd)

Comparison of the frequencies of types of chromosome, nuclear, mitotic damage done by the two metals, silver and cadmium, showed cadmium to have a more total effect at the genetically effective doses studied than did silver.

In the course of this study of the mutagenicity of silver and cadmium for oyster eggs, considerable information was obtained on the background of cyto-genetic errors occurring in eggs of the oysters used in this study. On the average 3.2% of all the cells had some mutation or disturbance of the mitotic apparatus at the cell or chromosome level. Of these about 1% could be classified as severe mutations. Approximately 35% of all the eggs on the average had some such disturbance in one or more cells. About 12% of the eggs had at the least one severe mutation. What this means in terms of the mutagenicity of the present pollution load in nature can only be guessed at without additional work designed and conducted specifically for the purpose of elucidating this point. The point is, nonetheless, raised and ought not be ignored.

It can be said now that there is irrefutable evidence for the genetically damaging effects of these two heavy metal marine contaminants for a commercial fishery species. It would, of course, be foolish on the basis of present data and on the basis solely of genetics data alone to correlate simply so much chromosome damage to so much reduction in recruitment into the fisheries. It would, however, be more foolish to suppose some correlation did not or could not exist or that such data should not be recognized as one of many important parameters characterizing the future of a fish population. Detectable chromosome damage in any species correlates with dominant lethality, reduced vigor, genetic disease, and carcinogenesis. Because genetic damage is insidious, it can be more profound and long-lasting in its impact on the fisheries than many other effects of contaminants more obvious to the eye or more conventionally tested for in fishery biology.\* It has lastly been demonstrated that the genetic tests applied here can extend the sensitivity of at least some contaminant assays several-fold.

## II. Genetic Study of Mutation Incidence in Field-sampled Fish Eggs Taken Directly out of the Neuston -

A new technique developed for a very specialized study of mammalian chromosomes was modified and tested on the fish eggs sampled from the neuston of the heavily polluted New York Bight. Excellent, repeatable, predictable and permanent staining of the chromosomes of the partly dissociated cells of the cleaving fish eggs has been obtained. Technical quality of the preparations is such that chromosome breakage and genetic damage to the mitoses of fish eggs sampled directly from the polluted neuston is now being scored with reliability and with facility. Prior to this technical development such information was either very difficult or impossible to obtain since the chromosomes of such eggs were stainable only for a short time after their fixation

---

\* While calculating incidences of induced mutations in dividing fish eggs, the Russians (radioecologist, Polikarpov, and his school) published work correlating these to lowered incidences of development to larval stages and to malformations of development, a correlation that could be well anticipated. They in addition, however, concluded that increased incidence of mutations of individual cells at early embryo stages correlates with increased mortality and lowered viability at much later stages.

## 9. Results (contd)

which has to be done on the vessel immediately on their sampling. In addition, other essential processing steps developed for the successful preparation of such eggs for cyto-genetic study either further reduced stainability of the eggs or rendered them virtually unstainable for cyto-genetic assay. Neuston-sampled eggs have so gone from being an extremely difficult material to study cyto-genetically to being an excellent assay, study and even display material. Providing the chromosomes of the fish species involved differ sufficiently in number and form, identification of the species by way of their chromosomes should further be possible.

The significance of this is that now, for the first time, samples of fish eggs spawned in nature can be taken directly out of a fishery and assayed genetically for pollution damage. That at least some pollutants do genetic damage reducing numbers of developing eggs that can become viable, vigorous larvae is already clear from experimental work (see Part I under Results).

NMFS SUBTASK PROGRESS REPORT  
(See Detailed Instructions)

January 10, 1975

(Submit four copies.)

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National Oceanic and  
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Washington, D.C. 20235

3. REPORTING PERIOD

July 1 - December 31, 1974

4. TDP NO. PLUS STP SUFFIX

MAC-014-75-IE-A-1(03)

5. SUBTASK TITLE

Assessment of Genetic Damage to Gametogenesis by Mutagenic  
Marine Contaminants

6. NO. OF A/E	7. %	8. STATUS
1 A	100	Accomplished ahead of schedule.
2 A	100	Accomplished ahead of schedule.
3 A		Dropped because of re-programming.
8 A	100	Accomplished with some additional hitherto unscheduled work yet to be done.

Status of the work reflects, as will future reports, the re-programming of 75% of the Genetics work back to Aquaculture.

9. RESULTS

It is being demonstrated that the genetic and cyto-genetic damage done by the marine contaminant, silver, to the germ-line primordia of commercial American oysters not in gametogenesis is later correlated with damage detected cytologically at the cellular level during gametogenesis. Silver was in 0.5 to 4.5 ppb given over a two-month period in ozonized seawater to semi-dormant oysters. This again shows the "permanence" of genetic derangements of cells, their transmission from germ-line primordial cells to spawned gametes.

10. OFFICIAL PREPARING REPORT (Signature)

*James J. Powell* Investigation Chief  
Director of Investigations

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Suderbaum*

1975

January 10, 1975

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3. REPORTING PERIOD

July 1 - December 31, 1974

4. TDP NO. PLUS STP SUFFIX

MAC-015-75-IE-A-1(01

5. SUBTASK TITLE

Physioecology (8818P801)

NO. OF A/E	7. %	8. STATUS
1 A	90	Lobster, chronic exposure to cadmium - ahead of schedule.
2 A	90	Lobster, chronic exposure to mercury - ahead of schedule.
3 A	90	Cunner, acute exposure to silver - on schedule.
4 A	80	Cunner, chronic exposure to cadmium - on schedule.
5 A	100	Striped bass, chronic exposure to cadmium - on schedule.
6 A	100	Striped bass, chronic exposure to mercury - on schedule.
7 A	20	Bivalves, chronic exposure to silver - on schedule.
8 A	80	Blue crabs, chronic exposure to cadmium - on schedule.
9 A	10	Surf clam embryos, acute exposure to heavy metals - behind schedule.
0 A	0	Lobster larvae, chronic exposure to cadmium - to be started later.
1 M	10	MS - Effect of cadmium and mercury on lobsters - on schedule.
2 M	10	MS - Effect of cadmium and mercury on striped bass - on schedule.
3 M	75	MS - Effect of silver on surf clams - on schedule.
4 M	25	MS - Effect of cadmium on blue crabs - on schedule.
5 M	0	MS - See Activity No. 9 above.

RESULTS

1. Major testing completed - 150 lobsters exposed.
2. Major testing completed - 150 lobsters exposed.
3. Major testing completed.
4. Major testing completed.
5. Testing completed - 500 striped bass 3 to 5 inches exposed.
6. Testing completed - 240 striped bass 3 to 5 inches exposed.
7. Data incomplete.
8. Testing completed. MS being prepared by Oxford Laboratory.
9. Difficulties in spawning of surf clams.
10. Not to be initiated until late FY 1975 or early FY 1976.
11. Data being calculated and analyzed.

(OVER)

OFFICIAL PREPARING REPORT (Signature)  
*Anthony Calabrese* Investigation Chief  
*James S. Smith* Director of Investigations

11. AMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Suderbaum*

9. Results (contd)

12. Data being calculated and analyzed.
13. MS near completion.
14. Data being completed and analyzed.
15. No data - see No. 9 above.

1975

January 10, 1975

MAC-015-75-IE-A-1(02

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Washington, D.C. 20235

3. REPORTING PERIOD

July 1 - December 31, 1974

5. SUBTASK TITLE

Physiological Effects (8818P802)

NO. OF /E	7. %	8. STATUS
A	90	Effects of cadmium on lobster respiration and osmoregulation - ahead of schedule.
A	90	Effects of mercury on lobster respiration and osmoregulation - ahead of schedule.
A	90	Effects of silver on cunner respiration and osmoregulation - on schedule.
A	80	Effects of cadmium on cunner respiration and osmoregulation - on schedule.
A	100	Effects of cadmium on juvenile striped bass respiration - testing completed.
A	100	Effects of mercury on juvenile striped bass respiration - testing completed.
A	20	Effects of silver on bivalve molluscs - on schedule.
A	100	Effects of cadmium on rock crab respiration - on schedule.
M	10	Data being analyzed - MS on schedule.
M	10	Data being analyzed - MS on schedule.
M	10	Data being analyzed - MS on schedule.
M	75	MS in preparation.
M	50	MS in preparation.

RESULTS

1. Elevated gill tissue O<sub>2</sub> consumption after 30-day exposure.
2. Data being analyzed.
3. Acute exposure to silver resulted in depressed oxygen consumption and no osmoregulatory change.
4. Depressed oxygen consumption.
5. Depressed gill tissue oxygen consumption after 30- and 60-day exposures.
6. Depressed oxygen consumption (30-day exposure) returns to normal after 90-day exposure.
7. Data incomplete.
8. Data being analyzed.
9. MS in preparation.
10. MS in preparation.
11. MS in preparation.
12. MS (surf clams) in draft form.
13. MS in preparation.

OFFICIAL PREPARING REPORT (Signature)

*Walter P. Thurberg* Research Physiologist  
*James S. ...* Director of Investigations

11. RMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. ...*

1975

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2. DATE PREPARED

January 10, 1975

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3. REPORTING PERIOD

July 1 - December 31, 1974

4. TDP NO. PLUS STP SUFFIX

MAC-015-75-IE-A-1(03)

5. SUBTASK TITLE

Biochemical Effects (8818P803)

6. NO. OF A/E	7. %	8. STATUS
1 A	90	Lobster, chronic exposure to cadmium - on schedule.
2 A	90	Lobster, chronic exposure to mercury - on schedule.
3 A	90	Cunner, acute exposure to silver - on schedule.
4 A	80	Cunner, chronic exposure to cadmium - on schedule.
5 A	100	Striped bass, chronic exposure to cadmium - on schedule.
6 A	100	Striped bass, chronic exposure to mercury - on schedule.
7 A	10	Bivalve molluscs, exposure to silver - on schedule.
8 A	100	Rock crab, chronic exposure to cadmium - on schedule.
9 A	NA	Baseline studies on transaminase in marine animals - continuing study.
10 M	10	MS - Biochemical effects, cadmium and mercury in lobsters - on schedule.
11 M	10	MS - Biochemical effects, acute exposure to Ag salts in cunner - on schedule.
12 M	10	MS - Biochemical effects, cadmium and mercury in striped bass - on schedule.
13 M	50	MS - Biochemical effects, chronic exposure to Cd in rock crab - on schedule.

RESULTS

1. Major testing completed.
2. Major testing completed.
3. Major testing completed.
4. Major testing completed.
5. Testing completed.
6. Testing completed.
7. Preliminary work under way. Experimental to start in FY 76.
8. Testing completed.
9. Seasonal variations in rock crab being gathered (heart transaminase).
10. Data being calculated and analyzed.
11. Data being calculated and analyzed.
12. Data being calculated and analyzed.
13. MS in preparation.

10. OFFICIAL PREPARING REPORT (Signature)

*James E. Smith*  
Research Chemist  
Director of Investigations

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Suderbaum*

1975

1/15/75

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3. REPORTING PERIOD

1st half; 1/2

July 1 - December 31, 1975

4. TDP NO. PLUS STP SUFFIX

MAC-016-75-LS-A-1  
(01)

5. SUBTASK TITLE

Molluskan Pathobiology

NO. OF A/E	7. %	8. STATUS
1	95	Ultrastructural studies of <u>Macoma balthica</u> neoplasm have been completed. <u>Ostrea lurida</u> and <u>Mytilus edulis</u> neoplasms have been examined and are being analyzed.
2	95	A publication describing the ultrastructure of <u>M. balthica</u> neoplasm has been prepared and is to be submitted in January.
3	95	The ultrastructure of oyster papovavirus is also described in the publication to be submitted in January.
4	25	Data are complete for manuscript describing ultrastructural cytopathology of oysters infected with papovavirus. Manuscript describing ultrastructure of virus substituted.
5	0	Scheduled for last half FY 75.
6	N/A	Diagnostic services have been provided on a continuing basis on request from states, Federal agencies, universities, and industry.
7	25	Histological examination of Korean oysters has proceeded on a quarterly basis, and technical assistance provided Republic of Korea.
8	50	Manuscript describing <u>Minchinia</u> sp. parasite from Korea has been updated and will be submitted in February. Data are being gathered for publication concerning nematode parasite of surf clam and its hyperparasite.

RESULTS

1. Macoma balthica neoplasms were examined, via thin section electron microscopy, providing morphologic evidence which supported the concept that this neoplasm originated by transformation of gill epithelial cells. 2. Manuscript describes characteristic features of the M. balthica neoplastic transformation which are suggestive of chemical carcinogenesis and not of viral origin. 3. The ultrastructure of ovacystis virus was described in the above publication. Features relating to size, morphology, site of replication and nucleic acid constituents provided a tentative conclusion that this virus belongs to the papilloma virus group. 4. Photomicrographs and tentative interpretive information are completed and a paper is in preparation describing the cytopathology of papilloma virus infections in the oyster. 6. Diagnostic services have been provided to organizations concerning the following: a) oyster mortalities - the

OFFICIAL PREPARING REPORT (Signature)

*Ed Kern*

NMFS DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Ruderman*

9. Continued

states of Delaware and Washington and the Chatham Oyster Co.; b) mortalities in mussels - state of New York; c) parasitic nematodes - the surf clam industry.

7. Two samples of Korean oysters have been received this fiscal year, on a quarterly basis; no new Minchinia sp. infections have been found. Technical training provided scientist from Republic of Korea visiting Oxford Lab.

8. Korean oyster manuscript describes Minchinia sp. parasite found in oysters examined over a two-year period. Data being compiled on distribution of nematode in the surf clam. Nematodes are hyperparasitized by a haplosporidan, tentatively identified as belonging to the genus Urosporidium.

1. FISCAL YEAR  
1975

2. DATE PREPARED  
1/13/75

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3. REPORTING PERIOD  
July 1 - Dec. 31, 1974  
1st half; 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-016-75-LS-A-1  
(02)

5. SUBTASK TITLE  
Crustacean Pathobiology

NO. OF A/E	7. %	8. STATUS
100		Manuscript on virus symptomatology, pathology, and electron microscopy, co-authored by P.T. Johnson & J.E. Bodammer completed, reviewed, & submitted to J. Invert. Pathol, Dec. 1974
25		Examination, tabulation, and synthesis of collated data on virus-infected tissues continuing
-		Begins last quarter
100		All tissues from crabs collected May-Oct. (the summer population) have been prepared, examined, and data concerning <u>Paramoeba</u> prevalence and pathology have been recorded.
20		Collections from Nov. processed, examined; data recorded as 4A above
-		Begins fiscal 1976
100		Tissues examined from 30-day Cd-exposed crabs; data collated and synthesized
25		Tissues from 60-day Cd-exposed crabs being processed. Not available for examination
-		Begins last quarter
25		Normal shrimp from 3 collections (Sept.-Nov., New York Bight) have been processed by various means. Available material has been examined
0		Only normal shrimp material available from N.Y. Bight to date; therefore, no comparisons possible between normal and abnormal animals
2	15	Data synthesis continues on normal crab tissues by molt condition, physiological state, age, and reproduction state

**RESULTS**  
1. Manuscript completed, have not heard whether accepted. 2. Consistent virus involvement of hematopoietic cells and destruction of hemocytes was found in the Chincoteague Bay series. Tissues of Chesapeake Bay crabs collected summer 1973 are also virus infected. 4&5. Paramoeba-infected crabs occur all seasons of the year so far sampled. Paramoeba is a consistent parasite of blood sinuses and hemal spaces within connective tissue. Spill-over into circulating blood and overt symptomatology occur only at terminal stages of the disease. 7. Gill pathology is the only consistent change found in 30-day Cd-exposed crabs. 8. No information as yet. 10. Bouin's fixed material unsatisfactory with present staining methods. Sectioning difficulties mainly solved. 11. Estimate of molt condition can now be accomplished histologically.

OFFICIAL PREPARING REPORT (Signature)  
*Phyllis T. Johnson*

FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Suckerman*

1. FISCAL YEAR  
1975

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3. REPORTING PERIOD  
1st half; 1/2  
July 1 - December 31, 1975

4. TDP NO. PLUS STP SUFFIX  
MAC-016-75-LS-A-1  
(03)

5. SUBTASK TITLE  
Fish Pathobiology

6. NO. OF A/E	7. %	8. STATUS
		<p>Activities suspended pending return of principal investigator from NOAA training assignment at the University of Wisconsin.</p>

9. RESULTS

10. OFFICIAL PREPARING REPORT (Signature)

11. EMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Sudermain*

1975

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3. REPORTING PERIOD

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July 1 - December 31, 1975

4. TDP NO. PLUS STP SUFFIX

MAC-016-75-LS-A-1  
(04)

5. SUBTASK TITLE

Histological Services

NO. OF A/E	7. %	8. STATUS
1	33	All samples and specimen materials processed and prepared for histological examination on schedule.
2	33	All periodic reports, manuals, and instruction sheets prepared on schedule.

**RESULTS**

1, 2. Technical service performed; no other result.

OFFICIAL PREPARING REPORT (Signature)

*Glenn Bernfield*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Linderman*

1975

1/15/75

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3. REPORTING PERIOD

1st half; 1/2

July 1 - December 31, 1974

4. TDP NO. PLUS STP SUFFIX

MAC-016-75-LS-A-1  
(05)

5. SUBTASK TITLE

Diseases of Larval Mollusks

NO. OF A/E	7. %	8. STATUS
1	2	Activity initiated in December 1974 with literature review to learn methods previously used for isolation of bivalve pathogens from hatchery and laboratory culture.
2	0	Data collection and collation for identification of bivalve larval pathogens to begin in FY 1976.
3	35	Consultations to reduce incidences of hatchery disease by improvement of water quality have been made with 1) Dr. Robert Shleser, U. Cal., Bodega Marine Lab., Bodega, California, 2) Mr. Paul Chanley, Shelter Island Oyster Co.; Greenport, N. Y., 3) Mr. Richard Eissinger, International Shellfish Enterprises, Moss Landing, California, 4) Mr. Chet Belknap, Pacific Mariculture Inc., Moss Landing, California, and 5) Dr. Liebovitz, Cornell Univ., Ithaca, N.Y.
4	10	Assessment of ozonization and other treatments of raw seawater for bivalve larval disease prophylaxis proceeding slowly due to lack of an assistant.
5	0	Data collection to find methods for improving seawater quality will not begin until Fiscal Year 1976.
6	0	Manuscript preparation describing methods for improving seawater quality will not begin until FY 1976.
7	65	Inactivation of <u>Gonyaulax</u> toxin by ozone gas demonstrated in laboratory and field experiments.
8	100	Manuscript indicating inactivation of <u>Gonyaulax</u> toxin completed and accepted for publication by the Marine Technology Society.

RESULTS

1. No results are available as the study is in the planning stage. 3. Consultations with Sea Grant and shellfishery personnel have shown that pathogens are a common problem in mariculture facilities. Pathogen control by ozonization has been recommended and is presently being used by three major shellfish installations. In addition, a workshop was convened to assemble all data on uses of ozone in aquatic installations. Proceedings of the Aquatic Applications of Ozone Workshop are now being prepared. 4. Methods to remove ozone residual and peroxy radicals implicated in chromosome damage to oyster larvae have been tested with limited success. Lack of an assistant trained in identifying damaged larvae hampers progress. 7. While complete inactivation of Gonyaulax toxin has been shown in laboratory and small field studies, pilot scale demonstrations in actual depuration facilities during toxic red tides are necessary to insure complete

OFFICIAL PREPARING REPORT (Signature)

*William Blomfield* (W. Blomfield)

OFFICIAL DIRECTOR OR DESIGNATED REPRESENTATIVE (Signature)

*Carl J. Anderson*

9. Continued

success of this project. 8. The manuscript, Inactivation of Paralytic Shellfish Poison by Ozone Treatment, was accepted by the proceedings editors of the 4th Food-Drugs from the Sea Conference. Another paper is now being prepared which will describe ozonization techniques used in a field study during an actual red tide event.

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July 1 - December 31, 19744. TDP NO. PLUS STP SUFFIX  
MAC-017-75-1E-A-1  
(01)

5. SUBTASK TITLE

Fin Rot Disease in the New York Bight

6. NO. OF A/E	7. %	8. STATUS
1	50	Monthly "corridor" cruises to the N.Y. Bight to determine fin rot prevalence are on schedule through December
2	0	Data on fin rot prevalence will be analyzed at end of 4th quarter
3	100	Prepared ms. on histopathology of fin rot in the N. Y. Bight.
4	100	Prepared ms. on fin rot prevalence in the N.Y. Bight.
5	10	Eight traps have been fabricated and rigged for placement in the N. Y. Bight.
6	0	Examination of laboratory-held winter flounder with fin rot to begin in 3rd quarter
7	0	Ms. on laboratory-held winter flounder with fin rot will be drafted at end of 4th quarter
8	0	Summer flounder fin rot incidence studies to begin in 4th quarter
9	0	Data on fin rot prevalence will be analyzed in FY 76.

## RESULTS

1. Winter flounder with fin rot in N.Y. Bight apex 29/1869 (1.5%); outside apex 0/267. Fluke with fin rot in N.Y. Bight apex 18/687 (2.6%); outside apex 0/553. 3. Ms. on histopathology of fin rot in winter flounder from N.Y. Bight submitted to Journal of the Wildlife Disease Association. 4. Ms. on prevalence of fin rot in winter flounder from N.Y. Bight in press in Marine Pollution Bulletin. 5. One trap containing 12 winter flounder placed in sewage sludge area near Ambrose channel lost.

10. OFFICIAL PREPARING REPORT (Signature)



11. EMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)



1975

1/15/75

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July 1 - December 31, 1974

4. TDP NO. PLUS STP SUFFIX  
MAC-017-75-1E-A-1  
(02)

5. SUBTASK TITLE  
Immunity in Marine Fish

6. NO. OF A/E	7. %	8. STATUS
1	98	Examination of flounder for antibody to environmental bacteria nearly complete; slight slippage due to difficulty in maintaining growth of some bacteria.
2	100	Determination of antibody response in laboratory-immunized flounder from polluted and clean areas complete on schedule.
3	75	Programmed examination of effects of cadmium on antibody response in striped bass and cunners is in progress on schedule.
4	10	Manuscript preparation for numbers 1, 2, and 3 is in preliminary stages as scheduled.
5	0	Evaluation and publication of environmental contact with bacteria in flounder is expected to be on schedule upon completion of manuscript.
6	50	Slippage in determining water concentration levels of <u>Vibrio</u> agent causing ulcers in flounder; this was due to loss in virulence of bacterial cultures.
7	100	Examination of Long Island Sound fish sera for antibody to ulcer disease agent complete on schedule.
8	0	Manuscript for numbers 6 and 7 is scheduled for following months.
9	0	Completion and publication of manuscript detailing pathogenicity of <u>Vibrio</u> ulcer disease agent is scheduled for FY 76.
10	15	Scheduled studies of bacterial pathogenicity in flounder are in initial stages as programmed.
11	0	Examination of <u>Vibrio</u> - phagocyte interaction in <u>Vibrio</u> - susceptible and non-susceptible fish is scheduled for FY 76.
12	0	Examination of cadmium-caused phagocytic defect in cunners and striped bass is scheduled for FY 76.

9. RESULTS  
Partially evaluated results indicate a higher incidence of antibacterial antibodies in serum of flounder from the polluted N. Y. Bight than from a clean area. No correlation was found between antibody titers and presence of fin rot disease. 2. Summer flounder from two polluted areas, when immunized in the lab, gave higher antibody responses to bacterial antigens than those caught in a clean area (another indication of higher previous bacterial exposure in polluted areas). 3. Exposure of cunners to 12 ppm cadmium for 96 hr causes some suppression in their antibacterial antibody response. Chronic exposure studies in striped bass is in progress. 4. Literature survey for manuscripts covering number 1, 2, and 3 is nearly complete. 6. Incomplete experiments indicate that addition of a newly discovered Vibrio species to aquarium water at about 400 cells per ml (or less) results in ulcers in winter flounder. 7. 71% of the blackfish,

10. OFFICIAL PREPARING REPORT (Signature)  
*Alan Deming for Richard Robison*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) (CONT)  
*Carl J. Anderson*

9. Continued

61% of the summers, 14% of the windowpane flounder and 10% of the winter flounder examined in Long Island Sound had significant serum antibody titers to the Vibrio ulcer disease agent.

1975

1/15/75

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3. REPORTING PERIOD 1st half, 1/2  
July 1 - December 31, 1974

4. TDP NO. PLUS STP SUFFIX  
MAC-017-75-1E-A-1  
(03)

5. SUBTASK TITLE

Microfauna of New York Bight Fish and Benthos

6. NO. OF A/E	7. %	8. STATUS
1	50	Amoeboid protozoa identified to genus; some to species
2	100	Collections have been made from sewage, dredge, acid waste and control stations
3	50	Abstracts on preliminary data have been published (see attachment)
4	50	Approximately 200 specimens (crabs & lobsters) have been processed for histological examination
5	100	Principal taxonomic groups of microorganisms associated with gill fouling have been documented
6	100	Principal differences in gill fouling microorganisms associated with different host animals have been documented
7	100	Comparative histopathology of Crustacea from N. Y. Bight and from Sandy Hook Bay have been completed
8	25	Collection trips for Atlantic mackerel have been scheduled for April 1975
9	25	Procedures for collection, fixation, and histology of mackerel tissues have been determined for April 1975 study
10	50	Proposals for aquaculture studies are in preparation by Director of Investigation
11	100	Literature pertaining to aquaculture studies has been collected and summarized

9. RESULTS

1. 26 species of amoeboid protozoa identified from N.Y. Bight. 2. Amoeboid protozoa isolated in pure culture and data being evaluated. 3. See attached sheet - publications. 4. All collections of crabs & lobsters showed at least 50% incidence of gill-associated microorganisms & gill discoloration. 5. Accumulation of granular debris and also tissue necrosis found to cause gill discoloration. 6. Cancer crabs had high incidence of bacterial infection, diatom infestation, & tissue lesions; Callinectes & Ovalipes had high incidence of ciliate infestation. 7. High incidence of ciliate infestation in Sandy Hook Bay & low incidence in N.Y. Bight showed that further study to compare shallow water & deep water sites was necessary. 8. No results for FY 75 until April 1975. 9. No tissue collection until April 1975. 10. Aquaculture studies scheduled for FY 76. 11. Literature from aquaculture studies indicate protargol silver staining techniques will have to be initiated for identification of protozoa.

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*Clara Bonifant for T. K. Sawyer*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Suderwan*

PUBLICATIONS  
NEW YORK BIGHT MICROFAUNA STUDIES  
T. K. SAWYER

- Sawyer, T. K. 1974. Protozoa associated with gill fouling in four species of decapod marine Crustacea. J. Protozool. 21: 437 (Abstract).
- Sawyer, T. K. 1974. Marine amoebae in sediment and seawater from selected sites in New York Harbor. Trans. Am. Microsc. Soc. 93: 433 (Abstract).
- Sawyer, T. K. 1975. Description of a heat tolerant species of Acanthamoeba (Amoebida) from ocean sediment. Trans. Am. Microsc. Soc. 94 (in press), (Abstract).
- Sawyer, T. K. 1974. Histological observations on discolored gills of the lady crab, Ovalipes ocellatus. Trans. Am. Microsc. Soc. 94 (in press), (Abstract).
- Sawyer, T. K. and J. L. Griffin. 1975. A proposed new family, Acanthamoebidae N. Fam. (order Amoebida) for certain cyst-forming filose amoebae. Trans. Am. Microsc. Soc. 94: 93-98.
- Sawyer, T. K. 1975. Marine amoebae from surface waters of Chincoteague Bay, Virginia. Nine new species within the families Mayorellidae Schaeffer, 1926, Flabellulidae Bovee, 1970, and Stereomyxidae Grell, 1966. Trans. Am. Microsc. Soc. 94: 71-92.

1975

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July 1 - December 31, 1974

4. TDP NO. PLUS STP SUFFIX

MAC-017-75-1E-A-1  
(04)

5. SUBTASK TITLE

Ultrastructural studies of normal and physiologically stressed  
crabs, fish, and mollusks

NO. OF A/E	7. %	8. STATUS
1	33	In conjunction with the Crustacean Pathology Program, the EM laboratory has participated in the preparation and examination of blue crab tissues in order to demonstrate various microorganisms believed to be involved in certain diseases.
2	0	Additional and highly specific information on the fine structural properties of certain cell organelles present in the hemocytes of the blue crab was deemed needed by the investigator before this project could be completed. These data have been obtained and the manuscript is presently being written.
3	100	Manuscript on virus symptomatology, pathology, and electron microscopy has been submitted to J. Invertebr. Pathol. in December 1974.
4	33	Fin tissues from normal and diseased (fin rot) winter flounder and fluke have been collected from fish inhabiting the New York Bight region. These specimens have been prepared for observation by both the scanning and transmission electron microscope. Difficulties have been encountered principally in finding fish whose tissues demonstrate the onset or progressive phase of the disease.
5	-	Not to be completed until January 1975
6	-	Not to be completed until April 1975
7	-	Not to be completed until March 1975
8	-	Not to be completed until July 1975
9	10	This project has just begun with preliminary observations on the blood cells of the striped bass currently being made.
0	-	Not to be completed until August 1975
1	-	Not to be completed until August 1975

## RESULTS

1. Virus-like particles, bacteria, and other microorganisms have been observed with the electron microscope in blue crab tissues in relation to pathologies under investigation. 2. Manuscript focusing on a detailed description of blue crab hemocytes being prepared. 3. Manuscript in journal review process. 4. Limited examples of fin tissues having the progressive phase of fin rot disease have shown that the surface epithelium (epidermis) may have areas of cellular disorganization accompanied by cell death, enhanced phagocytic-like activity of remaining cells, and loss of continuity within the epithelium to the point of serving as regions where the external environment may contact the underlying dermis. The cause of this type of lesion is unknown and presently no correlation with potentially causative microorganisms can be made. No results are available for items 5 through 11 listed above.

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Joel E. Balanice

ALL FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Signature)

Carl J. Anderson

1975

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July 1 - December 31, 1974

## 4. TDP NO. PLUS STP SUFFIX

MAC-017-75-1E-A-1  
(05)

## 5. SUBTASK TITLE

Registry of Marine Pathology

6. NO. OF A/E	7. %	8. STATUS
1	90	Policy discussions held with officials in and out of NOAA and NMFS leading to decisions on materials, accession methods, cataloguing, and retrieval systems
2	10	Review and revision of activity is continuous
3	100	Initial solicitation of accessions has been accomplished
4	95	An accession entry form has been prepared and is currently in use
5	100	All initial accessions have been received and catalogued
6	30	New accessions are being received and catalogued on a continuing basis
7	0	The first catalogue will be issued during the second half of FY 75
8	0	Solicitation of contributions outside NMFS will commence during FY 75.
9	0	First annual review is scheduled for FY 76.

## 9. RESULTS

1. Decision was made to emphasize slide material, space was allocated for storage, NOAA session on computer storage and retrieval of biological material was attended. 2. Activities are constantly under review to improve methods and policies. 3. All pertinent biologists in the Center were contacted, advised of the advent of ROMP and solicited for suitable contributions. Special emphasis was placed on personnel at the Oxford Laboratory. 4. An accession entry form was designed, tested, and modified several times. The form summarizes many pertinent details and is of great value for cataloguing and retrieval. Further modifications will be made as indicated. 5. Initial accessions are comprised of contributions from Oxford Laboratory biologists employed by NMFS and Maryland Department of Natural Resources. They include slides illustrating about 40 diseases or parasites in 10 species of bivalve mollusks and 1

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Harshel S. Tubwell

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Carl J. Suderman

9. Continued

decapod crustacean. 6. Accessions are being received and catalogued on a continuing basis with very promising developments for the next reporting period.

FY-75

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Distribution and Abundance of Prerecruits

6. NO.  
OF  
A/E

7. %

8. STATUS

1	100	Ichthyoplankton from spring cruise (FY 74) sorted and identified.
2	100	Ichthyoplankton data from spring cruise (FY 74) compiled and available to user groups.
3	100	Fall survey cruise (FY 75) completed.
4	5	Sorting and identifying of ichthyoplankton sampler from fall cruise started on schedule.
5	0	Providing data to user groups scheduled to begin 2nd half of FY.
6	0	Spring survey cruise scheduled to begin 2nd half of FY.
7	0	Sorting of ichthyoplankton from spring cruise scheduled to begin 2nd half of FY.

9. RESULTS

- Completed sorting and identification of larval and juvenile fishes from 77 plankton samples and 170 neuston samples collected during spring (FY 74).
- Compilation of both plankton and neuston samples completed.
- Sampled at 74 plankton stations and 170 neuston stations during fall (FY 75) cruise to assess distribution of early stages of fishes in coastal waters of Middle Atlantic Bight.
- Began sorting samples from fall cruise (FY 75).
- 5-7. Scheduled for 2nd half of FY.

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3. REPORTING PERIOD  
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4. TDP NO. PLUS STP SUFFIX  
MAC-053-75-LS-A-1 (02)

5. SUBTASK TITLE  
Diurnal Activities of Young Fishes - Field Work

6. NO. OF A/E	7. %	8. STATUS
1	100	Summer cruise completed.
2	100	Cruise report completed.

RESULTS

- Planned and conducted cruise in Middle Atlantic Bight to study diurnal activities of young bluefish and other associated species.
- Cruise reports completed and distributed.

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1. FISCAL YEAR  
FY-75

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3. REPORTING PERIOD

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4. TDP NO. PLUS STP SUFFIX

MAC-053-75-LS-A-1 (03)

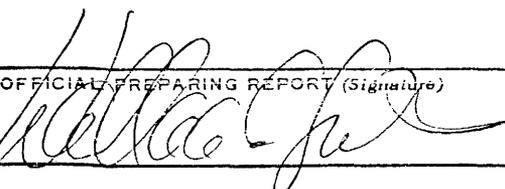
5. SUBTASK TITLE

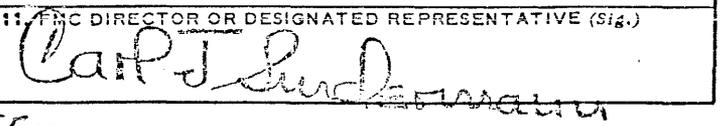
Analysis and Preparation of In-House Data for Publication

NO. OF A/E	7. %	8. STATUS
1	100	Ms on distribution of young flatfish completed.
2	75	Ms on distribution of young bluefish proceeding on schedule.
3	75	Ms on distribution of young Atlantic mackerel proceeding on schedule.
4	60	Manuscripts describing young <u>Merluccius</u> and searobins proceeding on schedule.
5	90	Ms describing distribution and occurrence of eels proceeding on schedule.
5	0	Active work on Ms for four species and three families scheduled to begin in 2nd half of FY.

RESULTS

- Ms describing distribution and abundance of young flatfish accepted for publication pending minor revisions, which have been made.
- Ms on all other fishes listed above proceeding on schedule.
- Scheduled for 2nd half of FY.

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3. REPORTING PERIOD  
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4. TDP NO. PLUS STP SUFFIX  
MAC-055-75-IE-R-1-01

5. SUBTASK TITLE  
Seabed Oxygen Consumption, New York Bight

6. NO. OF A/E	7. %	8. STATUS
1	90	On schedule. Soon to be complete.
2.	70	On schedule.
3	30	On schedule.
4	50	On schedule.
5	0	On schedule.
6	0	On schedule.
7	0	On schedule.
8	0	On schedule.
9	0	On schedule.
10	0	On schedule.

9. RESULTS

1. SYMAPS's for two cruises have been produced. Seabed oxygen consumption occurring between the dredge spoil and sewage sludge disposal areas is greatly depressed during the late summer compared with peripheral areas. This depression should have a marked influence on the distribution, abundance, and diversity of all living marine resources.

10. OFFICIAL PREPARING REPORT (Signature)

*John B. Pierce*

FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Suderbaum*

1975

January 1975

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MAC-055-75-IE-R-1-02

Phytoplankton and Primary Productivity, New York Bight

NO. OF A/E	7. %	8. STATUS
1	80	On schedule. Will complete cruises March 1975.
2	40	On schedule.
3.	25	Behind schedule due to loss of personnel in ADP and overloading of ADP facilities.
4.	5	Delayed due to computer processing.
5.	0	On schedule.

**RESULTS**

- Analyses for extractable organics, hydrocarbons (total) and aromatics for suspended and dissolved compartments of the water column are now being undertaken for us by the Exxon Engineering and Research Co.
- A size shift in phytoplankton from net plankton to nanoplankton occurs in the summer. Skeletonema, a diatom, dominates samples examined during the rest of the year.

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1. FISCAL YEAR  
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3. REPORTING PERIOD  
1st Half, 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-055-75-IE-R-1-03

5. SUBTASK TITLE  
Benthic Macrofauna, New York Bight

6. NO. OF A/E	7. %	8. STATUS
1	100	On schedule.
2	100	On schedule.
3	90	Report nearly completed.

9. RESULTS

1. Samples taken at 100 stations.
2. Sorting, identification, and enumeration completed of animals taken in one of five replicates per station, 63 stations, of Alabatross IV cruise, August 1973.
3. Report being prepared. Nearly completed.

10. OFFICIAL PREPARING REPORT (Signature)

*John B. Leare*

11. FMO DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Anderson*

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3. REPORTING PERIOD  
1st Half, 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-055-75-IE-R-1-04

5. SUBTASK TITLE  
Benthic Macrofauna - Sorting and Reporting

NO. OF L/E	7. %	8. STATUS
1	100	On schedule.
2	100	On schedule.
3	100	On schedule.

**RESULTS**

1. Samples logged and cared for.
2. Samples sorted and identified.
3. Data verified.

We intend to change this plan. Sorting is now done mainly by work-study students whereas it was done mainly on contract when the plan was conceived. This plan will terminate after this report and the plan will be incorporated in Benthic Macrofauna, New York Bight (STP suffix 03), which see.

OFFICIAL PREPARING REPORT (Signature)  
*John B. Pearce*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Suderhaus*

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3. REPORTING PERIOD  
1st Half, 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-055-75-IE-R-1-05

5. SUBTASK TITLE  
Benthic Macrofauna - Sorting and Reporting

5. NO. OF A/E	7. %	8. STATUS
1	100	On schedule.
2	70	Behind schedule. Productivity of group lower than it should be.
3	100	On schedule.

9. RESULTS

1. Samples logged and cared for.
2. The group participated in analyzing Albatross IV samples, Aug. '73, described under Subtask 04.
3. Data verified.

10. OFFICIAL PREPARING REPORT (Signature)  
*John B. Reese*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Sidermann*

1. FISCAL YEAR  
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3. REPORTING PERIOD  
1st Half, 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-055-75-IE-R-1-06

5. SUBTASK TITLE  
Statistical Design and Analysis - New York Bight

NO. OF /E	7. %	8. STATUS
80		Behind schedule. Contractor asked to supply analyses in addition to those called for in contract. In so doing, he fell behind schedule.
80		Report nearing completion.
70		On schedule.

**RESULTS**

- Special reports submitted in September and November in response to special requests by MESA office.
- Analyses for report completed.
- List of about 45 ecologically important species assembled; these species are being analyzed for usefulness as indicators.

OFFICIAL PREPARING REPORT (Signature) *John B. Pearson*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) *Carl J. Sundermann*

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MAC-055-75-IE-R-1-07

Benthic Meiofauna - Foraminifera - New York Bight

NO.  
OF  
A/E

7. %

8. STATUS

1

30

Behind schedule. Contractor has agreed to devote more time to this work.

RESULTS

- Contractor submitted a preliminary report in which certain foraminiferan species were described as tolerant of conditions at sewage and dredge spoil dump sites, but many more were found elsewhere. Work is continuing on a different group of samples which were preserved better than those already analyzed. Results not yet available.

10. OFFICIAL PREPARING REPORT (Signature)

*John B. Penue*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Linderman*

1. FISCAL YEAR  
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3. REPORTING PERIOD  
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4. TDP NO. PLUS STP SUFFIX  
MAC-055-75-IE-R-1-08

5. SUBTASK TITLE  
Benthic Meiofauna - Nematodes - New York Bight

NO. OF A/E	7. %	8. STATUS
1	30	Behind schedule. Contractor should spend more time on this research.

RESULTS

Report by another contractor (same TDP, Subtask 06) included analysis of sampling validity for nematodes indicating the number of benthic grabs needed to achieve specified levels of confidence. These results being applied to distribution of nematodes in vicinity of dumping sites. Distribution map(s) not yet produced.

OFFICIAL PREPARING REPORT (Signature) *John B. Lewis*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) *Carl J. Anderson*

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4. TDP NO. PLUS STP SUFFIX

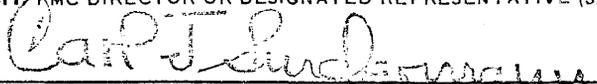
MAC-055-75-IE-R-1-09

5. SUBTASK TITLE

Benthic Meiofauna - Ciliates - New York Bight

NO. OF A/E	7. %	8. STATUS
90		Nearly all data generated. Data from only one more cruise planned.
90		Done for all data to date.

**RESULTS**  
Progress report received. Species of ciliates are excellent indicators of sludge dumping, both by which are present and which are absent. Their numbers also are nearly related to the dump sites.

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3. REPORTING PERIOD  
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4. TDP NO. PLUS STP SUFFIX  
MAC-055-75-IE-R-1-10

5. SUBTASK TITLE  
Phytoplankton and Primary Productivity - Apex New York Bight

NO. OF ✓/E	7. %	8. STATUS
1	100	Completed.
2	100	Completed.
3	100	Completed.
4	60	On schedule.
5		Final report being prepared.

RESULTS

- One year of field sampling completed.
- Data completed.
- Data report compiled.
- Correlations of data being investigated.

OFFICIAL PREPARING REPORT (Signature) *John B. Pearse* FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) *Carl J. Siedemann*

1. FISCAL YEAR  
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First half 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-055-75-IE-R-1 (11)

5. SUBTASK TITLE  
Analysis of Groundfish Samples for MESA Objectives

NO. OF V/E	7. %	8. STATUS
	50	Pathological samples collected and distributed on schedule.
	30	Data processing on schedule; analysis delayed.
	10	Preparation of semi-annual report begun on schedule.
	0	Annual report to MESA scheduled for 2nd half of FY.

RESULTS

- Fin rot samples collected from MESA stations on monthly and semi-annual cruises.
- Machine and hand processing of cruise data on schedule. Workload and personnel restrictions prevented any real progress in analysis.
- Station listings and preliminary catch data being compiled for summary report.
- Not scheduled during this report period.

OFFICIAL PREPARING REPORT (Signature)  
*James H. Garwood*

U.S. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Suderbaum*

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MAC-065-76-IE-R(01)

Ichthyoplankton Survey of the New York Bight

NO. OF A/E	7. %	8. STATUS
1	50	Conducted monthly cruises in New York Bight on schedule.
2	0	No progress on contract sorting - behind schedule.
3	50	Cruise reports prepared for monthly cruises in New York Bight.
4	0	No progress on sorting, counting and measuring - behind schedule.
5	0	No progress on analyzing plankton data - behind schedule.

**RESULTS**

- 1. Plankton monthly cruises in New York Bight completed on schedule.
- 2. Sorting contract delayed, no samples from monthly cruises sorted.
- 3. Cruise report prepared for each monthly cruise.
- 4. Samples from monthly cruises not sorted, thus no identifications, counts or measurements made.
- 5. Samples not sorted, no analysis of ichthyoplankton data.

A 4-month delay in signing of AEC contract and subsequent delay of sorting contract will delay all aspects based on sorting contract from 3 to 5 months.

OFFICIAL PREPARING REPORT (Signature) 	N. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) 
---	---

**NMFS SUBTASK PROGRESS REPORT**  
(See Detailed Instructions)

(Submit four copies.)

TO: Director, National Marine  
Fisheries Service, ATTN: Fx5  
National Oceanic and  
Atmospheric Administration  
Washington, D.C. 20235

3. REPORTING PERIOD

First half 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-065-76-IE-R(02)

5. SUBTASK TITLE

Atlas of Ichthyoplankton Data from R. V. Dolphin Survey  
1965-66

NO. OF A/E	7. %	8. STATUS
1	100	Accumulation of data completed on schedule.
2	80	Keypunching, auditing and editing of data proceeding on schedule.
3	100	Preparation of computer printout program completed on schedule.
4	40	Production of machine-generated listings proceeding on schedule.
5	20	Preparation of atlas underway and on schedule.

RESULTS

- All data pertaining to R. V. Dolphin collections amassed and forwarded to ADP section.
- All keypunching completed, provided auditing and editing find it error-free.
- Computer program to produce printout of data completed on schedule.
- Machine-generated listing of ichthyoplankton data from initial cruise produced for review and approval.
- Preparation of narrative section of atlas underway.

<p>10. OFFICIAL PREPARING REPORT (Signature)</p> <p><i>Arthur W. Kendall, Jr</i></p>	<p>11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)</p> <p><i>Carl J. Suderbaum</i></p>
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3. REPORTING PERIOD

First half 1/2

4. TDP NO. PLUS STP SUFFIX

MAC-065-76-IE-R(03)

5. SUBTASK TITLE

Diurnal Activities of Young Fishes - Lab Work

NO. OF A/E	7. %	8. STATUS
85		Sorting of summer FY 75 samples proceeding, behind schedule.
55		Identifying, counting and measuring larvae collections ahead of schedule.
75		Ms pertaining to diurnal activities of larval Atlantic mackerel and yellowtail flounder proceeding on schedule.

**RESULTS**

- Sorting of samples from summer cruise (FY 75) to study diurnal activities of bluefish are behind schedule due to the delay in signing AEC reimbursable sorting contract.
- Identifications, counts and measurements of bluefish and associated larvae ahead of schedule. Identifications and counts done by sorters.
- First draft of manuscripts on diurnal activities of yellowtail and Atlantic mackerel nearly completed.

OFFICIAL PREPARING REPORT (Signature) 	FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) 
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1. FISCAL YEAR  
FY-75

2. DATE PREPARED  
1/15/75

**NMFS SUBTASK PROGRESS REPORT**

(See Detailed Instructions)

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National Oceanic and  
Atmospheric Administration  
Washington, D.C. 20235

3. REPORTING PERIOD  
First half 1/2

4. TDP NO. PLUS STP SUFFIX  
MAC-065-75-IE-R(04)

5. SUBTASK TITLE  
Historical Hydrographic Data

NO. OF A/E	7. %	8. STATUS
1	50	Obtained hydrographic data from NODC; editing underway on schedule.
2	80	Updating of data on file at Sandy Hook proceeding on schedule.
3	10	Obtaining and editing hydrographic data from other NMFS sources underway, but behind schedule.
4	30	Accumulation and processing of raw data at Sandy Hook underway, but behind schedule.
5	50	Compilation of hydrographic data from all sources on schedule.
6	50	Forwarding processed data to BNL ahead of schedule.

RESULTS

- Obtained hydrographic data from NODC. Editing behind schedule because of lack of personnel at beginning of fiscal year.
- Updating of data on file at Sandy Hook proceeding on schedule.
- Obtaining and editing pertinent hydrographic data from other NMFS sources behind schedule due to lack of personnel at beginning of fiscal year.
- Accumulation and processing of raw data on file at Sandy Hook behind schedule due to lack of personnel at beginning of FY 75.
- Compilation of all data on schedule but data from other NMFS sources is lacking.
- Forwarding processed data to BNL ahead of schedule. Some data already forwarded.

OFFICIAL PREPARING REPORT (Signature)  
*Arthur W. Kendall, Jr.*

NMFS DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
*Carl J. Sunderman*

NMFS SUBTASK PROGRESS REPORT  
(See Detailed Instructions)

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Director, National Marine Fisheries Service, ATTN: Fx5  
National Oceanic and Atmospheric Administration  
Washington, D.C. 20235

3. REPORTING PERIOD  
1st Half, 1/2

2. DATE PREPARED  
January 1975

4. TDP NO. PLUS STP SUFFIX  
MAC-067-75-IE-A-1-01

5. SUBTASK TITLE  
Phytoplankton and Primary Productivity, New York Bight

O. F. E.	7. %	8. STATUS
	80	On schedule. Will complete cruises Mar. 1975.
	40	On schedule.
	25	Behind schedule due to loss of personnel in ADP and overloading of ADP facilities.
	5	Delayed due to computer processing.
	0	On schedule.

RESULTS  
 . Measurements have been made in Raritan Bay on the concentration of totla hydrocarbons present in the water column in the ppb range. These measurements were accomplished for us by Exxon Engineering and Research Co.  
 . Major size shifts in the phytoplankton do occur. During the summer nanophytoplankton (usually Nanochloris) predominate. During the remainder of the year netphytoplankton (Sheltonema) predominate.

OFFICIAL PREPARING REPORT Signature  
James P. Thomas John B. Pearce

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)  
Carl J. Suckerman

**NMFS SUBTASK PROGRESS REPORT**  
(See Detailed Instructions)

2. DATE PREPARED  
January 1975

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Washington, D.C. 20235

3. REPORTING PERIOD

1st Half, 1/2

4. TDP NO. PLUS STP SUFFIX

MAC-069-75-IE-R-1-01

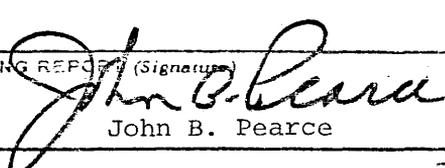
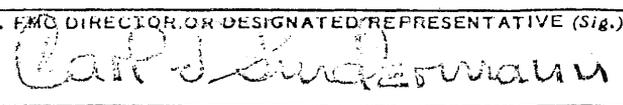
5. SUBTASK TITLE

Effects of Dredge Spoil Disposal (New London, Conn.) on  
Benthic Macrofauna

NO. OF /E	7. %	8. STATUS
1	33	First two of six quarterly field surveys completed on schedule.
2	13	First of eight quarterly reports submitted on schedule.

RESULTS

- Baseline and early dumping phase samples collected from 45 stations (sediment samples plus five macrofauna replicates).
- Have found 157 species in predump samples; several types of communities evident within the 25 square mile study area.

OFFICIAL PREPARING REPORT (Signature)  Robert Reid      John B. Pearce	11. FMO DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) 
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1. FISCAL YEAR  
1975

**NMFS SUBTASK PROGRESS REPORT**

(See Detailed Instructions)

2. DATE PREPARED  
January 1975

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TO: Director, National Marine  
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Atmospheric Administration  
Washington, D.C. 20235

3. REPORTING PERIOD

1st Half, 1/2

4. TDP NO. PLUS STP SUFFIX

MAC-069-75-IE-R-1-02

5. SUBTASK TITLE

Effects of Dredge Spoil Disposal (New London, Conn.) on  
Physical and Chemical Oceanography of Dump Site

NO. OF A/E	7. %	8. STATUS
1	33	Activities for first third of field survey schedule completed as planned.
2	13	First of eight quarterly reports submitted on schedule.

**RESULTS**

- Five cruises conducted to measure currents, water chemistry, turbidity and seston in dumping area.
- Found no significant effects of dumping to date, turbidity of entrained water masses returned to baseline within three hours after a dump.

10. OFFICIAL PREPARING REPORT (Signature)

Robert Reid

*John B. Pearce*  
John B. Pearce

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Sundermann*

**NMFS SUBTASK PROGRESS REPORT**

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3. Director, National Marine  
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National Oceanic and  
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Washington, D.C. 20235

3. REPORTING PERIOD

1st Half, 1/2

4. TDP NO. PLUS STP SUFFIX

MAC-069-75-IE-R-1-03

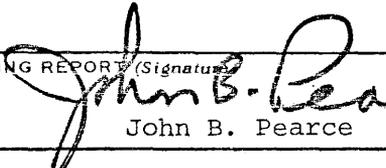
5. SUBTASK TITLE

Effects of Dredge Spoil Disposal (New London, Conn.) on  
Suspended Matter, Phytoplankton and Shellfish of Thames River

NO. OF /E	7. %	8. STATUS
1	33	Activities for first third of field survey schedule completed as planned.
2	13	First of eight quarterly reports submitted on schedule.

**RESULTS**

- Twenty cruises completed, investigating temperature, salinity, suspended solids, light transmission, turbidity, heavy metals in sediments and shellfish, shellfish populations, chlorophyll a, b and c.
- Model of Thames' baseline circulation begun. River oysters found to have high baseline heavy metals levels. Sediment elutriates did not inhibit photosynthesis.

OFFICIAL PREPARING REPORT (Signature)  Robert Reid                      John B. Pearce	11. TMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.) 
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1975

**NMFS SUBTASK PROGRESS REPORT**

(See Detailed Instructions)

2. DATE PREPARED

1/15/75

(Submit four copies.)

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National Oceanic and  
Atmospheric Administration  
Washington, D.C. 20235

3. REPORTING PERIOD

1st half, 1/2

July 1 - December 31, 1974

4. TDP NO. PLUS STP SUFFIX

MAC-070-77-EI-R-I

5. SUBTASK TITLE

Studies of proliferative cell conditions in selected species  
of mollusks from Chesapeake Bay

NO. OF A/E	7. %	8. STATUS
1	8	Experimental studies with chlorinated hydrocarbons on selected mollusks scheduled to begin in December are being set up
2	0	Not scheduled to begin until FY 76
3	8	Monitoring of selected mollusks from Chesapeake Bay will begin soon pending modification of equipment. One sample of oysters from Delaware Bay has been received and is being processed.
4	1	Sampling protocols have been formulated for chemical analysis of molluscan tissues, water column and sediments
5	0	Not scheduled to begin until FY 76
6	0	Not scheduled to begin until FY 76

RESULTS

1. Attempts to induce neoplasms in the clam Macoma balthica using the pesticides Aldren and dieldren (recently shown to be carcinogenic, and present in the estuarine environment) will be undertaken. 3. One oyster in the Delaware Bay sample had grossly apparent multiple papillomas of the mantle. 4. Actual initiation of project dependent on appropriate funding.

OFFICIAL PREPARING REPORT (Signature)

*Carl J. Sanderman*

11. FMC DIRECTOR OR DESIGNATED REPRESENTATIVE (Sig.)

*Carl J. Sanderman*