SOME AGENCY INTERESTS IN THE HUDSON RARITAN ESTUARY PROJECT: A SUMMARY OF INTERVIEWS

J. R. Schubel
J. Schoof

June 1980

MARINE SCIENCES RESEARCH CENTER
STATE UNIVERSITY OF NEW YORK
STONY BROOK, NEW YORK 11794

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J. R. Schubel

J. R. Schubel, Director

INTRODUCTION

In August 1979 we submitted a proposal to the Marine Ecosystems Analysis (MESA) New York Bight Project Office to assist in the development of a planning document for the Hudson-Raritan Estuary Project (HREP). This report completes the first phase of our study. Its principal objectives are

1) To summarize management objectives considered to be most important for conservation and rehabilitation of the Hudson-Raritan estuarine system by some of the agencies responsible for management of that system and its important uses.

2) To summarize scientific questions identified by these agencies that must in their opinion be answered to address effectively the management questions.

In a subsequent report we will assess which of these scientific questions are tractable with the resources of money and time available to the Hudson-Raritan Estuary Project and outline how we believe they can be attacked most effectively.

This report is based upon a series of meetings with key representatives of a number of city, county, regional, state, and federal agencies charged with responsibility for management of the Hudson-Raritan estuarine system and uses of that system. Within two weeks after each meeting a memo containing our interpretation and summary of the comments

made by the agency representatives was sent to them for their comment and approval. In only one case were revisions requested. Following meetings with individual agencies, we had two general meetings. All individuals who contributed were invited to one, or both, of these meetings.

This report summarizes information contained in the memos and derived from our general meetings. We have organized the material and in so doing have imposed a structure upon it. But we have tried not to alter its content. The concerns expressed here are those of the agency representatives. The recommendations to HREP are theirs. Our role in this report has been one of investigative reporters, not editorial writers. To retain this quality of the report, we have kept our comments to a minimum; most of the report is in outline form.

The names of the agencies, departments and individuals we met with are listed in Table 1.

A number of individuals indicated the need to assess the effectiveness of past, present, and proposed management strategies to rehabilitate the Hudson-Raritan estuarine system. They suggested that the criteria for measuring effectiveness should include improvements in environment quality, improvements in the quantity, quality, kinds and diversity of living resources; and changes in the use patterns of the estuarine system. Management strategies identified for examination and effects that should be evaluated are summarized in outline form in the next section of the report entitled

"Management Strategy Analyses." For each management strategy, scientific questions identified by interviewers as required input to management strategy analysis are also given.

The final two sections of the report summarize the needs expressed for regional plans and for improving the coordination among agencies responsible for management of the Hudson-Raritan estuarine system and the uses society makes of it.

Table 1 LIST OF AGENCY REPRESENTATIVES INTERVIEWED

	DATE OF MEETING	AGENCY REPRESENTATIVES (and Titles)
New York City		
208 Program NOW: Water Quality Development Unit	4 Oct. '79	John Roswell (Project Director) (Professional Engineer and Chief)
Planning Commission Land Planning & Environmental Management	3 Dec. '79	Martin Goldstein (Unit Director)
Public Health Engineering	3 Dec. '79	Arthur Ashendorff (Director)
New York State Department of Environmental Conservation	27 Sept.'79	Terry Agriss (Regional Director)
Regulatory Affairs		Gordon Colvin (Regional Permit Administrator)
Division of Coastal and Marine Resources	3 Oct. '79	Anthony Taormina (Director)
Land Resources Subdivision NOW: Water Management	18 Oct. '79	Robert Cook (Director) (Assistant Director)
Division of Water	18 Oct. '79	Russell Mt. Pleasant (Associate Director)
Survey & Analysis Section		Terry Olmstead (Sr. Sanitary Engineer)
		Clarke Liu (Research Scientist III)

Table 1 LIST OF AGENCY REPRESENTATIVES INTERVIEWED

	DATE OF MEETING	AGENCY REPRESENTATIVES (and Titles)
New York State Department of Environmental Conservation (Continued)		
Natural Resources	18 Oct. '79	Herbert Doig (Assistant Commissioner)
Fish & Wildlife Administration	18 Oct. '79	Kenneth Wichs (Director)
New Jersey Department of Environmental Protection		
Division of Coastal Resources & Development		
Bureau of Coastal Planning & Development	4 Feb. '80	John Weingart (Chief)
		Richard Kantor (Environmental Scientist II)
Interstate Sanitation Commission	9 Nov. '79	Thomas Glenn (Director & Chief Engineer)
Port Authority of New York & New Jersey		
Marine Planning & Construction Division NOW: Port Department	30 Nov. '79	Maurice de Picciotto (Manager) (Assistant Director)
Planning & Development Department		Joseph Birgeles (Supervising Transportation Planner)
		Ernest Haun (Sr. Marine Terminals Operations Analyst)

Table 1 LIST OF AGENCY REPRESENTATIVES INTERVIEWED

	DATE OF MEETING	AGENCY REPRESENTATIVES (and Titles)
Tri-State Regional Planning Commission		
Economic Development & Land Use	28 Jan. '80	Joel Weiner (Director)
		Robert Richmond (Assistant Director)
U.S. Army Corps of Engineers New York District		
Water Quality Compliance Section	25 Oct. '79	Dennis Suskowski (Chief)
Environmental & Economist Analysis Branch		Robert Will (Fish & Wildlife Biologist)
Regulatory Branch		James Mansky (Biologist)
U.S. Environmental Protection Agency		
Surveillance & Analysis Division	19 Dec. '79	Barbara Metzger (Director)
Marine Protection Program		Peter Anderson (Chief) (Chief)
U.S. Park Service		
Gateway National Recreation Area		
Division of Professional Services	28 Jan. '80	John Tanacredi (Natural Resources Management Specialist)

MANAGEMENT STRATEGY ANALYSIS

I. Sewage, Sludge Dumping

A. Strategy Analysis

1. Strategies:

a. Mandated cessation of dumping at sea by 1981

b. Various alternative modes of disposal

2. Potential Effects:

a. Changes in environmental quality

b. Changes in water quality

c. Changes in the quality of living resources

d. Changes in the assemblages and abundances of living resources

e. Changes in use patterns

f. Time scales of change

B. Scientific Questions

1. What are the effects of sewage sludge disposal on the environment and the living resources of the New York Bight?

2. What changes can be anticipated in environmental quality, in the abundance, assemblages, and quality of the living resources and in the use patterns of the New York Bight following cessation of sewage sludge dumping in the Bight?

3. How long will it take for such changes to occur?

4. What is the impact of sewage sludge dumping compared with the impacts of other activities in the New York Bight, e.g., dredged material disposal, and the discharge from the Hudson-Raritan estuary?
5. What are the alternatives to sewage sludge dumping in the New York Bight Apex and what are the environmental, public health, and socio-economic impacts of each?

II. Sewage, Upgrading Treatment

A. Strategy Analysis

1. Strategies:

a. Mandated upgrading of treatment plants

b. Any strategy which retains combined sewers and storm drains

2. Potential Effects:

a. Changes in environmental quality

b. Changes in water quality

c. Changes in the quality of the living resources

d. Changes in the assemblages and abundances of living resources

e. Public Health

f. Changes in Primary productivity

g. Changes in use patterns

h. Costs

i. Changes in dissolved oxygen levels

j. Changes in the frequency (probability) of anoxic events and of the duration and geographical extent of anoxic zones

k. Changes in nutrient levels and their forms of occurrence

l. Changes in use patterns of the estuary and the New York Bight

m. Time scales of change

B. Scientific Questions

1. What are the effects of present discharges of sewage effluent on the environment, the living resources and the uses of the Hudson-Raritan estuarine system and the New York Bight?
2. What changes can be anticipated in environmental quality, in the abundance, assemblages, and quality of the living resources, and in use patterns of the Hudson-Raritan estuarine system and the New York Bight Apex with implementation of present and proposed plans for upgrading of sewage treatment plants?
3. How long will it take for such changes to occur?
4. How will New York City's system of combined sewers and storm drains affect the efficiency of upgrading sewage treatment in attaining the desired changes in environmental quality?
5. How will different levels of treatment affect the distribution of dissolved oxygen in the Hudson-Raritan estuarine system, in the New York Bight Apex, and in western Long Island Sound?
6. Are present concentrations of nutrients in the Hudson-Raritan estuarine system and in the New York Bight Apex undesirable?
7. How will different levels of treatment affect the distribution of nutrients in the Hudson-Raritan estuarine system and in the New York Bight Apex?

8. How will changes in nutrient levels affect primary productivity?
9. How will different levels of treatment affect the distribution of suspended solids in the Hudson-Raritan estuarine system and in the New York Bight Apex?
10. How will different levels of treatment affect use patterns of the Hudson-Raritan estuarine system and the New York Bight Apex?

III. Sewage, Increasing Dilution

A. Strategy Analysis

1. Strategies:

a. Alter the configuration of the estuary with structures to increase flushing and dilution

2. Potential Effects:

a. Changes in flushing rate

b. Changes in mixing rate

c. Costs

d. Changes in water quality

e. Changes in the quality of the living resources

f. Changes in the assemblages and abundances of living organisms

B. Scientific Questions

1. Can jetties or other engineering structures be designed to increase the flushing of the Harbor?

2. What effects would the resulting increased flushing have on the levels of pollutants in the Hudson-Raritan estuarine system and on the living resources?

IV. Contaminants, Discharges

A. Strategy Analysis

1. Strategies:

a. Eliminate all contaminant discharges to the Hudson-Raritan estuarine system

b. Control selected sources of contaminants to achieve desired changes in use patterns of particular segments of the Hudson-Raritan estuarine system

2. Potential Effects:

a. Changes in environmental quality

b. Changes in water quality

c. Changes in the quality of the living resources

d. Changes in the assemblages and abundances of living resources

e. Public Health

f. Changes in use patterns

g. Costs

h. Time scales of change

i. Persistence of contaminants now present

B. Scientific Questions

Sources, Routes and Rates of Dispersal, Sites of Accumulations.

1. What are the sources of the various contaminants to the Hudson-Raritan estuarine system--their strengths and locations?

2. Which of these are most amenable to control? At what costs?
3. What are the routes and rates of dispersal of contaminants into, within, and through the Hudson-Raritan estuarine system?
4. What are the sites and rates of accumulation of contaminants within the Hudson-Raritan estuarine system?

Pre-treatment, Source control

1. How effective could pre-treatment be in reducing the inputs of the various contaminants, individually and collectively, to the Hudson-Raritan estuarine system?
2. What changes in environmental quality, in the biota, and in use patterns of the estuary could be expected for each of a variety of pre-treatment strategies?
3. What degree of contaminant source control is required to attain for different segments of the estuary specific changes in environmental quality, in the quality and character of the biota, and in use patterns. What are the costs?

Biota

1. How do the various contaminants, individually and collectively affect the living resources?
2. How do the various contaminants, individually and collectively, affect the utilization of

the living resources?

3. How do the various contaminants, individually and collectively, affect public health?

Sediments

1. How long would contaminated sediments persist in the Hudson-Raritan estuarine system if the discharge of all contaminants could be stopped?
2. What are the effects of sediment disturbances by dredging, storms, tidal currents, etc., on the release of contaminants (especially chlorinated hydrocarbons) to the water?
3. How do the impacts of contaminants from dredging and dredged material disposal compare with those from other sources and activities, e.g., industrial wastes, sewage effluents?
4. How does sediment quality vary geographically within the Hudson-Raritan estuarine system? Does the variability in sediment quality mimic the variability in quality of the overlying waters?
5. Can contaminated sediments be contained and isolated from the biota by burial beneath the sea floor and capping with clean sediment?

Persistence

1. How long would the effects of contaminants now in the system persist if all sources were were eliminated?

V. Dredging and Dredged Material Disposal

A. Strategy Analysis

1. Strategies:

a. Halt disposal of all dredged materials in the New York Bight

b. Halt disposal of contaminated dredged materials in the New York Bight

c. Dispose of dredged materials on land

d. Dispose of dredged materials in a time-varying geographical pattern governed by the character of the material and the sensitivity of the biota

e. Combining submarine sand mining with disposal of contaminated dredged material in the pits and capping with clean material

2. Potential Effects:

a. Changes in environmental quality

b. Changes in the quality of the living resources

c. Changes in the assemblages and abundances of living resources

d. Public health

e. Costs

f. Changes in use patterns

g. Time scales of change

B. Scientific Questions

1. How does the impact of dredged material disposal on the quality of the environment and the biota of the New York Bight compare with the impacts of sewage sludge dumping and the discharge from the Hudson-Raritan estuarine system through the Sandy Hook-Rockaway Transect?
2. What changes in environmental quality, in the quality and character of the biota, and in the use patterns of the New York Bight would follow cessation of all dredged material disposal in that area? Over what time periods?
3. Can contaminated dredged materials be contained and isolated from the biota by burial beneath the sea floor and capping? If so, where and under what conditions?
4. Where are contaminated sediments accumulating in the Hudson-Raritan estuarine system and at what rates?
5. What are the properties--physical and chemical including contaminant levels--of materials accumulating in navigation channels within the Hudson-Raritan estuarine system? How would the different kinds of material behave geochemically if placed in different sorts of disposal environments--marginal areas, islands, open waters, burial beneath the sea floor, upland, etc.--and what

ecological and human health effects, both short and long-term, would result from their disposal in each environment?

VI. High Flow Skimming

A. Strategy Analysis

1. Strategy:

a. Skimming of Hudson during high flow periods to augment New York City's freshwater supply

2. Potential Effects:

a. Changes in environmental quality

b. Changes in water quality

c. Displacement of salt front

d. Changes in the assemblages and abundances of living resources

c. Cropping of fish eggs and larvae

B. Scientific Questions:

1. How will the proposed high flow skimming project affect the upstream limit of sea salt penetration?

2. How will the change in sea salt penetration affect spawning of anadromous and semi-anadromous fishes?

3. Will the fish eggs and larvae lost through diversion be manifested in reductions in the adult populations of these species?

VII. Depuration of Hard Clams

A. Strategy Analysis:

1. Strategy:

a. Expand the program of depuration of hard clams and other shellfish from the Hudson-Raritan estuarine system by extending the approved geographical limits of harvesting

2. Potential Effects:

a. Human health effects associated with viruses

b. Human health effects associated with chemical contaminants

c. Costs

d. Economic impact on shell fisheries in other New York waters

B. Scientific Questions:

1. What is the feasibility of expanding the program for depuration of shellfish by extending the approved geographical limits of harvesting?

2. If depuration reduces coliform levels to acceptable limits, does it also reduce levels of other pathogens, metals, chlorinated hydrocarbons, and other contaminants below FDA limits?

3. What would be a simple diagnostic index for assessing the safety of hard clams and other

shellfish for human consumption?

4. What environmental parameters should be evaluated in setting geographical limits for harvesting of shellfish for depuration? What is the appropriate threshold value for each parameter?

VIII. Dissolved Oxygen

A. Strategy Analysis

1. Strategy:
   a. Maintain dissolved oxygen at, or above, a uniform selected threshold throughout the Hudson-Raritan estuarine system
   b. Maintain dissolved oxygen at, or above, levels specified for different segments of the estuarine system, with thresholds determined by uses of the particular segment
2. Potential Effects:
   a. Changes in environmental quality
   b. Changes in the quality of living resources
   c. Changes in the assemblages and abundances of living resources
   d. Changing in use patterns
   e. Costs

B. Scientific Questions

1. What are appropriate criteria for setting dissolved oxygen standards for different segments of the Hudson-Raritan estuarine system?
2. What are appropriate dissolved oxygen standards for different segments of the estuary?
3. How do present levels of DO compare with these thresholds?

4. How do present DO levels affect use patterns of the Hudson-Raritan estuarine system?
5. What changes in use patterns would result from changing DO levels to meet proposed standards?
6. Are proposed standards attainable? In what segments of the estuary? Under what conditions and at what costs?
7. How will implementation of proposed plans for up-grading sewage treatment change DO levels throughout the Hudson-Raritan estuarine system?

REGIONAL PLANS NEEDED

Dredged Material

Introduction

A regional dredged material management plan should be developed for the Hudson-Raritan estuarine system. The plan should ensure that required maintenance dredging projects can be carried out without prolonged and costly delays and with predictable and acceptable risk to the environment and the living resources, including people. The plan should also provide mechanisms for decision making on new projects. The plan should be based upon an identification of the alternatives and a rigorous assessment of the environmental, economic, socio-political, and public health impacts associated with each of the full range of alternatives.

Because most dredged material comes from channels that require frequent maintenance dredging and because these are the materials that are most likely to be enriched in contaminants and, as a result, pose the most serious disposal problems, they should receive the greatest attention. Since the quality of these materials probably does not change over periods of at least several years, and perhaps over a decade or more unless there is a major spill, systematic programs should be initiated to thoroughly characterize these materials and to evaluate the disposal options. Only in this way can dredging and dredged material disposal be removed from a crises mode of management. The

public should be involved actively in the identification and evaluation of dredging/disposal alternatives.

Scientific Questions

1. What is the character of the material and associated contaminants accumulating in channels and slips that that require frequent maintenance dredging?
2. How do these characteristic properties vary spatially--in three dimensions--in each of the projects areas?
3. How many samples are required to characterize the materials accumulating throughout each project area?
4. What are the alternative disposal sites and strategies available for each project?
5. How would the dredged materials behave physically and chemically if placed in each of these sites?
6. What environmental effects are associated with each disposal option?
7. What ecological effects are associated with each disposal option?
8. What human health effects are associated with each disposal option?
9. What economic impacts are associated with each disposal option?
10. What socio-political effects are associated with each disposal option?
11. What criteria should be used in classifying sediments

as clean or contaminated?

12. When are the best times to dredge to minimize adverse impacts on the environment, the living resources, and other uses of the system?

Accommodating Multiple Uses

Introduction

The Hudson-Raritan estuarine system serves a number of important uses. Its value to the region depends upon continued accommodation of multiple uses. A number of the uses conflict, however, and a regional plan should be developed to minimize conflicts among uses and users.

The Hudson-Raritan estuarine system is the site of the nation's largest port; its waterways are vital arteries for shipping and transportation. The Lower Bay of New York Harbor has been an important source of sand for aggregate and fill. The system provides water to cool the condensers of steam electric plants with once-through cooling systems. The estuary is used as a transient receiver for human, municipal, and industrial wastes. It serves as a nursery and feeding area for a variety of species of fish, shellfish, and waterfowl. It is a passageway for anadromous and semi-anadromous species of finfish. The estuary supports commercial fisheries for shellfish and finfish. And, the Hudson-Raritan estuarine system is used for recreation: for boating, swimming, fishing, and for aesthetic enjoyment.

All of these probably are legitimate uses of the system, but the demands they make on it are often in conflict. The conflicts arise principally between those uses, primarily recreation and fisheries, that require the maintenance of certain environmental quality standards, and other uses

that do not; uses which, in fact, lead to a degradation of environmental quality above some threshold level. To ensure the continued accommodation of multiple uses of the Hudson-Raritan estuarine system, an assessment should be made of present (and past) use patterns, the factors that dictate these use patterns, and what would be required to change them.

Scientific Questions

1. What are the present use patterns of the Hudson-Raritan estuarine system and the adjacent coastline?
2. What are the factors--environmental, economic, socio-political, legal, cultural, etc.--that determine these use patterns?
3. Would changes in environmental quality alter the prevailing use patterns?...How and in what segments of the estuary?
4. What actions would be required to attain these changes in environmental quality in different segments of the estuary?
5. Are these actions practicable?...economical?
6. How can the desired uses be apportioned among various segments of the estuary most effectively--with minimum conflict among uses and user groups?

ORGANIZATION AND INFORMATION

A number of agency representatives we interviewed stressed the need for more effective coordination of monitoring and research activities and for more effective interagency information flow among those agencies responsible for management of all, or parts, of the Hudson-Raritan estuarine system and for the uses made of it. There was a general feeling of malaise caused by the uncertainty of knowing who was doing what, where, when, and how.

The recommendation was made to establish an advisory group in the initial stages of HREP to coordinate HREP studies with other efforts and to ensure information flow from HREP to user and interest groups. A number of individuals suggested a useful early product of HREP would be a directory of agencies, institutions, and individuals that have information and expertise on the Hudson-Raritan estuarine system. Who are they? What is their area of expertise? What are their responsibilities? What information do they have? Who do you contact for information? To what extent will they help?

Several individuals expressed the need for a regional, environmental information system; one that contains site specific data for the estuary and for the adjacent shoreline. The system should be one that could be updated easily, accessed readily, and that would be capable of summarizing appropriate date in response to specific questions. A

computer-based system would be required.

Agency representatives stressed the need for HREP-supported scientists to cast the results of their research in forms that could be applied readily by managers and planners to resolution of their problems.