QUALITY STANDARDS FOR THE COASTAL WATERS OF LONG ISLAND, NEW YORK

Leonard Ortolano

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A Presentation to the
Marine Resources Council,
Nassau-Suffolk Regional Planning Board
under
Sea Grant Project GH-63
National Science Foundation

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INTRODUCTION*

Water quality standards have been used as a planning instrument for a number of years. In general, standards and associated water use classification schemes are used to control wastewater discharges to attain specified levels of water quality. This discussion considers the nature and use of water quality standards in relationship to the management of activities in the coastal zone of Nassau and Suffolk Counties.

We begin by considering what the term "standards" means in the context of New York State's Public Health Law, as well as the rationale used to establish such standards. Following, this, we define the term "classification", and discuss the process used in classifying waters, as well as the manner in which water classifications are used.

The second part of the discussion considers the New York State water quality standards in some detail. We begin by defining some technical terms that appear explicitly in the standards. Following this, we present the salient features of the various standards that apply to the tidal waters of New York State, including the recently adopted standards for temperature. We will also mention the present status of the acceptability of New York State's standards with respect to the Federal Water Pollution Control Administration (FWPCA).

After having considered the New York State standards in some detail, we will turn to the coastal waters of Nassau and Suffolk Counties. In this context, we consider two issues: (1) How are the coastal waters of Long Island currently classified? and (2) What is the current status of those waters in relationship to the classifications? The discussion is concluded with some observations concerning the manner in which the existing standards might be modified in order to make them more precise and more comprehensive.

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*The assistance of Robert O. Brush in preparing this presentation is gratefully acknowledged.

BACKGROUND INFORMATION

Responsibility for Establishing Standards

The statutory authority for controlling all types of water pollution in New York State is derived from Article 12 of the State Public Health Law. The broad policy underlying the Act is stated in Section 1200, which provides:

> "It is declared to be the public policy of the State of New York to maintain reasonable standards of purity of the waters of the State consistent with public health and public enjoyment thereof, the propagation and protection of fish and wildlife, including birds, mammals and other terrestrial and aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods to prevent and control the pollution of the waters of the State of New York."

The purpose of the Act (Section 1201) is stated expressly to be the safeguarding of the waters of the State from pollution by: "(a) preventing any new pollution, and (b) abating pollution existing when this chapter is enacted, under a program consistent with the declaration of policy above stated . . ."

The Water Pollution Control Board of the State of New York was established in 1949 and given the authority to classify the waters of the State [5, p.76]. In January of 1962 the Board was abolished, and its functions were transferred in part to the Department of Health and in part to the Water Resources Commission. The members of the Commission include the Attorney General, the Superintendent of the Department of Public Works, and the Commissioners of the following departments: Conservation, Agriculture and Markets, Health, and Commerce. The Water Resources Commission has the authority to classify waters and establish standards. The State Commissioner of Health is responsible for enforcement [6, p.47].

Definition of the Term "Standards"

In terms of the New York State Public Health Law a water quality "standard" is a description of water quality characteristics necessary to allow a given use.* For example, the standard to support an activity like shellfishing is essentially a description of the quality of water required if shellfishing is to be permitted. This description includes a number of quantitative items; e.g., the most probable number of coliform bacteria must be less than 70 per 100 milliliters. It also includes more general items, such as the requirement prohibiting the presence of sewage or waste effluents, except where "effectively disinfected." The items mentioned above are based on public health considerations; however, the standards for shellfishing contain additional items, such as the requirement prohibiting sludge deposits, which are based on the need to provide an environment physically suited to the growth of shellfish.

In general, the numerical limits on water quality characteristics necessary to support a given water use are determined on the basis of some combination of established theory and extensive empirical evidence. For example, the minimum value of dissolved oxygen to support sport fishing is an issue that has received considerable attention using controlled laboratory investigations. On the other hand, numerical values for the maximum allowable concentration of coliform bacteria to support water contact sports, including bathing, water skiing, etc., are ones that are based primarily on field experience. That is, the limiting values commonly used have been shown over long periods of time to result in waters that are acceptable for water contact sports. While there is still debate among

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* Some states use the term "criteria" in the same way that New York uses the term "standard." To eliminate confusion the former term will not be used in this discussion except in the section concerning thermal discharges.

experts as to what the precise limits should be, there is at least enough general agreement to permit the establishment of a limiting value. This is in contrast to a number of water quality characteristics for which, due to a lack of basic knowledge, it is not possible to establish numerical limits. Included in this class are various nutrients which consist of compounds of phosphorous and nitrogen. It seems clear enough that beyond some limit nutrient additions are directly related to excessive growths of aquatic plants, yet we just don't know enough about the nutrient cycles in quantitative terms to establish numerical limiting values. It is not that such numbers could not be developed, but rather that it would be difficult to get numbers that a large number of people, knowledgeable about these issues, would be able to agree on.

One of the key references describing the state-of-the-art of water quality standards (when the term is used as defined above) is a study by Professor McKee at Cal Tech performed originally in the early 50's and revised in 1963 [6]. A more recent fundamental source of information is the report of the National Technical Advisory Committee on Water Quality Criteria which appeared in April 1968 [3]. This latter reference was the result of a substantial effort by a large number of national authorities.*

In summary, observe that a standard is a description of water quality characteristics necessary to allow a given use. For some characteristics, the description may be quantitative; e.g., a maximum allowable concentration for coliform bacteria. For other characteristics, the description may be a general statement; e.g., there are to be no sludge deposits caused by wastewater discharges.

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* One of the motives for bringing together such a large number of authorities was to put the available information on quality requirements to support different uses in a form that would be useful to the states. The Federal Water Quality Act of 1965 required that all states establish water quality standards and classifications by mid 1967.

Definition of the Term "Classification"

We now focus on the term "water classification" as it is employed in the context of the Public Health Law of New York State. Classification of a given body of water is tantamount to the establishment of the "best usage" of that water body. When a body of water is classified it receives a letter designation corresponding to the standard that would govern its quality. For example, the waters in Great South Bay on the south shore of Long Island are, for the most part, classified as SA. The letter designation "SA" corresponds to the standards which permit shellfishing for market purposes as the "best usage." As observed earlier, the standards for shellfishing establish a maximum allowable coliform bacteria concentration, etc. Thus, the act of classifying a water body establishes the best usage as well as the associated standards indicating the quality characteristics needed to support this use.

Note that a classification establishes target quality levels to be maintained or achieved, and does not necessarily correspond to existing quality. For example, classifying a given body of water as SA is not equivalent to stating that the water is currently suitable for shellfishing. In the event that such a water body is not currently meeting the standards for shellfishing, the process of classifying it SA establishes the desired target levels of quality that have yet to be achieved.

It is useful to emphasize the concept of "best usage" since it provides the rationale for deciding how a given water body is to be classified. Section 1205 of the Public Health Law states specifically that all waters of the State are to be classified "in accordance with consideration of best usage in the interest of the public." Note that the term <u>best</u> is not equivalent to <u>highest</u>

possible (i.e., use requiring the highest quality) since that could imply that all waste discharges are to be prohibited from watercourses. Rather, the term best, in our interpretation at least, is taken to mean most reasonable, given the nature of the local hydrology and the needs of the various individuals, municipalities, firms, and organized groups that will use the watercourse and the adjacent land. This interpretation is supported by the fact that the public expression of alternative viewpoints is an integral part of the classification process.

The Classification Process*

The first step in the classification process consists of making an assessment of the current quality of the water body in question. This generally involves a sanitary survey or some other program involving field measurements of water quality characteristics, and an investigation of existing water usage. Following this it may be necessary to estimate the levels of water quality that could be achieved with different levels of wastewater treatment, or other modifications in pollution sources. For example, if we were considering a bay currently receiving untreated sewage, then we might estimate the water quality attainable under conditions where that waste source was controlled with either primary or secondary or even tertiary treatment. Once the assessment of the current water quality is made and some estimates are made about the potential water quality at different levels of waste treatment, it remains for the State Water Resources Commission to recommend a classification for the water body in question. These recommendations are then considered at a public hearing, at which time all concerned individuals have an opportunity to express their opinions concerning the desirability of the proposed classification. Following the public hearing the State Water Resource Commission, after making any modifications they see fit, adopts a water use classification. In accordance with the Water Quality Act of 1965 there is one additional step needed in the classification process, namely, the approval of the classifications and standards by the FWPCA.

To put this process of classifying a water body in historical perspective we will make note of a particular case. As early as March, 1953 the waters of Shinnecock Bay and Mecox Bay on the south shore of Suffolk County received a recommended classification by what was then the Water Pollution Control Board. A little more than a year

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*The economic implications of classifying waters at different levels is an extremely important subject in itself, but well beyond the scope of our discussion. (See Thomas [15]).

later, following a public hearing, the classifications were adopted and assigned by the Water Pollution Control Board. Between the early 1950's and the late 1960's the process of classification noted for Shinnecock Bay and Mecox Bay was carried out for all of the coastal waters of Nassau and Suffolk Counties. In fact, as of about mid-1967 all of the interstate waters of New York State were classified, and the classifications and standards were approved by the FWPCA.*

How Standards and Classifications Are Used

Having established the meaning of the terms standard and classification as applied in New York, we now consider the manner in which these standards and classifications are used. We begin by considering their use by the State Health Department acting through the local health agencies; i.e., the health departments of Nassau and Suffolk Counties, respectively. It is useful to discuss health department activities in two parts corresponding to situations involving existing waste sources and proposed waste sources, respectively.

If an existing waste source causes a violation of a water classification, then the State Commissioner of Health, working with the relevant local health agency, can issue a formal "order to abate". The most dramatic example of the use of such orders on Long Island relates to the efforts to control wastes from duck farms on the south shore of Suffolk County. As of 1965 all duck farms on

*New York State was among the first 10 of all the states to have their classifications and standards approved by the FWPCA in accordance with the Water Quality Act of 1965. However, as mentioned below, some minor poblems have come up since the original approval.

Long Island had received formal orders to abate by the Commissioner of Health. As observed by Hennigan [4], these orders establish general specifications concerning the degree of waste treatment to be provided as well as a time schedule for implementation of such treatment works. The fact that duck wastes are still considered a problem by some serves to emphasize that the use of "orders to abate" is often a long and drawn out process.

As indicated above, the local health departments also have means for controlling proposed waste discharges in order to achieve or maintain quality levels consistent with a water's classification. It is required that those responsible for any proposed waste discharge to surface waters established that the discharge will not violate the quality levels associated with the existing use classification. Following this the local health departments issue a permit for the discharge.

It should be noted that the State Health Department very recently issued "additional rules and regulations pursuant to 'Criteria Governing Thermal Discharge (Heated Liquids)'." These rules, a part of Article 12 of the Public Health Law, specify in considerable detail the kinds of engineering, meteorological and ecological information that must be filed with the State Health Department in connection with proposed discharges of heated liquids. Such discharges cannot be made without obtaining permits for "construction and operation" from the State Health Commissioner.

The water use classifications can also be employed by the FWPCA. Under the Water Quality Act of 1965 the violation of a use classification can be employed as the basis for a federal "enforcement action".* The latter consists

*Special conditions are required to hold before FWPCA can proceed with an enforcement action; these conditions are delineated in Section 10 of the Water Quality Act of 1965 (Public Law 660 - as amended).

of a three-phase process the first of which consists of holding a "conference" at which all interested parties as well as the representatives from the State Health Department and the FWPCA discuss the causes of the violation. If mutually satisfactory abatement actions are not forthcoming, the conference stage can be followed by a public hearing. When necessary, the hearing can be followed by an action in which the Attorney General brings suit on behalf of the United States to secure abatement of pollution. The only federal enforcement action on Long Island to date consisted of two conferences in the late 1960's which dealt with pollution of Moriches Bay and the eastern section of Great South Bay [4].

Before discussing the details of the New York State standards it is useful to summarize the material presented thus far. We established that a standard for a given water use was equivalent to a specification of water quality characteristics necessary to support this use. We also observed that individual water bodies were classified on the basis of the following sequential procedure:

- Survey existing water quality.
- Examine possibilities for upgrading.
- Recommend classifications.
- Hold public hearings.
- Adopt final classifications.
- Obtain approval of FWPCA.

We also noted that the standards and classifications were being used by the local and state health departments as a basis for controlling the effluent discharge from both existing and proposed waste sources. In addition, these classifications could, under some circumstances, be used by the FWPCA to initiate enforcement proceedings.

NEW YORK STANDARDS FOR TIDAL WATERS

Preliminary Remarks and Definitions

Before proceeding with our discussion of standards it is useful to make special note of two water quality indicators, dissolved oxygen and coliform bacteria. Although these indicators were mentioned above, we will consider them here at a level of detail necessary to fully understand the implications of the numerical limiting values used in the standards.

The concentration of dissolved oxygen in a given volume of water is determined using standard procedures of analytical chemistry. The "saturation" value of dissolved oxygen is the maximum possible concentration; i.e., it is the value that would be obtained if a jar partly full of water were shook indefinitely and then following this, the dissolved oxygen concentration of the water was measured. The saturation value is influenced by the temperature, barometric pressure and dissolved solids concentration of the water. Typical values of saturation concentration are in the order of 7 to 10 milligrams per liter (or equivalently, parts per million).

Coliform bacteria are "indicator organisms" in the sense that their presence is used to indicate the contamination of a given sample of water by excreta from warm-blooded animals. Thus, coliforms serve as a proxy for a host of disease-causing microorganisms (e.g., tuburculosis bacteria, hepatitis viruses, etc.)* One of the limitations of coliform bacteria as an indicator is that their presence does not necessarily indicate contamination by excreta since coliform is itself rather ubiquitous in nature. However, despite this limitation, the correlations between coliform and fecal contamination observed over the years

* It would be prohibitively expensive to test for all known disease-causing microorganisms on a routine basis for water quality management purposes.

have established coliform's utility as an indicator.

The New York standards make explicit reference to the term "most probable number (MPN) of coliform bacteria." To understand the meaning of the term most probable number it is necessary to consider the manner in which coliform tests are performed in the laboratory. The least elaborate test involves inoculating a lactose broth solution with a portion of the water sample and incubating for a specified period; if gas is produced then this ("presumptive") test is said to yield positive results. However, a single test is not sufficient to determine the most probable number.

The MPN rests on a statistical model of how coliform bacteria are distributed in a given volume of water. To determine the MPN it is necessary to repeat the coliform test for a number (typically fifteen) of portions of a given water sample. This procedure yields information on the number of positive tests at different levels of dilution which, together with the statistical model, makes it possible to compute the MPN (generally expressed as the number of coliform bacteria per 100 milliliters of water). In practice the statistical computations are made with the aid of standard tables [1, pp. 503-506].

Finally, before considering the standards in detail, observe that the determination of what constitutes a representative number of water samples, and which methods are to be used in performing the various tests, is left to the Water Pollution Control Board [7, p.503].* In other words, the standards themselves do not contain formal rules for determining sampling locations and frequencies to be used in trying to establish if a given use classification is being violated.

*As a matter of general information, note that an authoritative reference describing commonly used testing procedures is Standard Methods for the Examination of Water and Wastewater, [1].

Standards Associated With Classes SA, SB, SC, SD and I*

A summary of the salient features of the standards for tidal waters is shown in Table 1. The left hand column in the table gives the letter designation corresponding to the different classes for tidal waters, as well as a summary statement concerning the associated best usage. For example, the first item in the left hand column is labelled "SA"; this is the letter designation used for waters classified for shellfishing for market purposes and any other uses. The column headings in the table show groups of water quality characteristics. For example, the first such group relates to floating solids, oil, settleable solids, and sludge deposits.

The entries in the body of the table give the descriptors corresponding to a given water quality indicator (or indicators) and a specified classification. Using the SA classification for illustrative purposes, observe that the first item relates to floating solids, oil, settleable solids, and sludge deposits. For SA waters there are to be none of these attributable to sewage, industrial wastes or other wastes. The next group of quality indicators includes garbage, cinders, ashes, oils, sludge or other refuse. For Class SA there are to be none of these in waters of the Marine district, where the latter is defined as waters within three miles of the land's edge. Reading across the table, observe that concerning sewage or waste effluents, SA waters are to have none which are not effectively disinfected. Dissolved oxygen concentration for SA waters must be not less than 5 parts per million. There are to be no toxic wastes, colored

*Note that for fresh surface water there is a counterpart to SA, SB, SC and SD designated A, B, C and D. New York State also has standards for ground water. A complete description of all standards is contained in the Classifications and Standards of Quality and Purity for Waters of New York State [7].

Table 1

Salient Features of Water Quality Standards for Tidal Waters

Class	Floating solids; oil; settelable solids; sludge deposits.	Garbage, cinders ashes, oils, sludge or other refuse.	Sewage or waste effluents	Dissolved oxygen	Toxic wastes, colored wastes heated liquids.*/	Organisms of coliform group
SA Shellfishing for market purposes	None attributable to sewage, industrial wastes or other wastes.	None in any waters of the marine district as defined by State Conservation Law.	None which are not effectively disinfected	Not less than 5.0 ppm	None adversely affecting edible fish or shellfish or best usage.*/	Median MPN not more than 70/100 ml. in shellfish growing areas.*/
SB Bathing but no shellfishing	"	"	"	"	None adversely affecting edible fish, shellfish or bathing or best usage.*/	N.A.
SC Fishing, but no shellfishing or bathing	None readily visible & attributable to waste; None which deleteriously increases amounts after reasonable dilution.*/	"	N.A.**/	"	None adversely affecting edible fish and shellfish or best usage.*/	N.A.
SD Any use except shellfishing bathing fishing	"	"	N.A.	Not less than 3.0 ppm	None adversely affecting survival of fish life or best usage.*/	N.A.
I Fishing, but no shellfishing or bathing	"	"	Effective disinfection if required by Int. San. Comm.	Ave. not less than 50% sat. in any week; but not less than 3.0 ppm anytime.*/	None affecting edible fish or shellfish or best usage.*/	N.A.

*/ Summary statement; full text available in Classification and Standards of Quality and Purity for Waters of New York State (N. Y. State Department of Health, November, 1968).

**/ "N.A." is read "Not applicable".

wastes or heated liquids which adversely affect edible fish or shellfish or "best usage". Finally, SA waters are to have a median most probable number of coliform group organisms not more than 70 per 100 milliliters in shellfish-growing areas.

Class SB (i.e., bathing) is in general the same as SA with the notable exception of organisms of the coliform group. While the State standards do not contain an entry here, the Nassau and Suffolk County health departments have a local standard; they use 240 per 100 milliliters as the maximum permissible most probable number of coliform organisms in areas suitable for bathing. For Class SC, which permits fishing but not shellfishing or bathing, the standards differ from SB in that the wording is changed for the item related to floating solids. There is no entry corresponding to the item for sewage or waste effluents.

Note that Class I is also for fishing but not shellfishing or bathing. In general the standard for Class I is quite similar to that of Class SC with the exception of dissolved oxygen where the wording is slightly different.* Finally, Class SD (which permits any use <u>except</u> shellfishing for market purposes, bathing or fishing) is the same as SC except that the requirement for dissolved oxygen is reduced from 5 parts per million to 3 parts per million.

*Class I was originally part of the standards set by the Interstate Sanitation Commission before the development of New York State standards.

Standards for Thermal Discharges

The standards for thermal discharges (heated liquids) are "None alone or in combination with other substances or wastes in sufficient amounts or at such temperature as to be injurious to fish life . . .or impair the waters for any other best usage." * A detailed set of criteria were established by the State Water Resources Commission in August, 1969 to govern decisions concerning whether a thermal discharge would "impair the waters for . . .best usage."

The criteria described below are those that are relevant for the coastal waters of Nassau and Suffolk Counties.

1) Coastal Waters

> No increase of more than $4^{o}F$ in surface temperatures over monthly high average during October-June, nor more than 1.5^{o} during July-September beyond radius of 300 feet or equivalent area [2].

2) Estuaries

> No increase beyond 90^{o} surface temperature at any single point; in addition, at least 50% of volume of estuary flow, including at least one-third surface water, may not be raised more than 4^{o} or to maximum of 83^{o}, whichever is less; during July-September, if surface temperatures exceed 83^{o}, increase of not more than 1.5^{o} will be permitted at any given point [2].

These descriptions are merely summaries; the complete wording of these standards is considerably more complex and may be obtained from the New York State Health Department. We have presented the criteria for both estuaries and coastal waters because the waters of Long Island Sound and its bays can be considered either coastal or estuarine; and, according to Health Department officials, it has not

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* Abstracted from mimeographed materials to supplement a news release by R. S. Drew, Secretary, New York State Water Resources Commission (March, 1969).

as yet been decided which of these designations will be used. As a consequence, both criteria are potentially relevant for the coastal waters of Long Island.

We conclude our discussion of standards by noting that with the exception of one or two minor points, the New York State standards have been approved by the Federal Water Pollution Control Administration. The minor points concern, in part, the standards and criteria for thermal discharges that were enacted in 1969, two years after the FWPCA's initial approval of the New York State standards and classifications.

CLASSIFICATIONS FOR THE COASTAL WATERS OF NASSAU AND SUFFOLK COUNTIES

The officially adopted classifications for the waters of Nassau and Suffolk Counties are given in a series of reports by the State Health Department [8 - 14]. It was not feasible to compress all the classifications for coastal waters given in these reports on to a single reasonably sized map. Consequently to obtain the classification of any specific water body it is necessary to consult the State Health Department reports directly.

The map shown in Figure 2 provides a broad overview of the official classification. (Figure 1 is a map of Long Island included for general information purposes.) As indicated in Figure 2, the majority of the coastal waters are classified SA; i.e., suitable for shellfishing for market purposes and any other usages. It is especially noteworthy that almost all the coastal waters on the north shore are classified SA.

On the south shore the bays (and waters south of the barrier beaches) are practically all SA. The tidal portions of streams draining into south shore bays have various classifications, but SC and I predominate; such waters are suitable for fishing, but not bathing or shellfishing for market purposes. Of the relatively small number of south shore waters that are not SA, SC or I, those in Nassau County are primarily SB, and those in Suffolk County are primarily SD.

Having seen how the coastal waters are classified, it is relevant to assess the extent to which these classifications are currently achieved. This assessment requires information on existing water quality; i.e., the results from field sampling programs. Such programs are expensive and time consuming, and as a consequence, they generally cannot be carried out on a continuing basis for any given body of water. Therefore, information concerning the current status of the waters is incomplete.

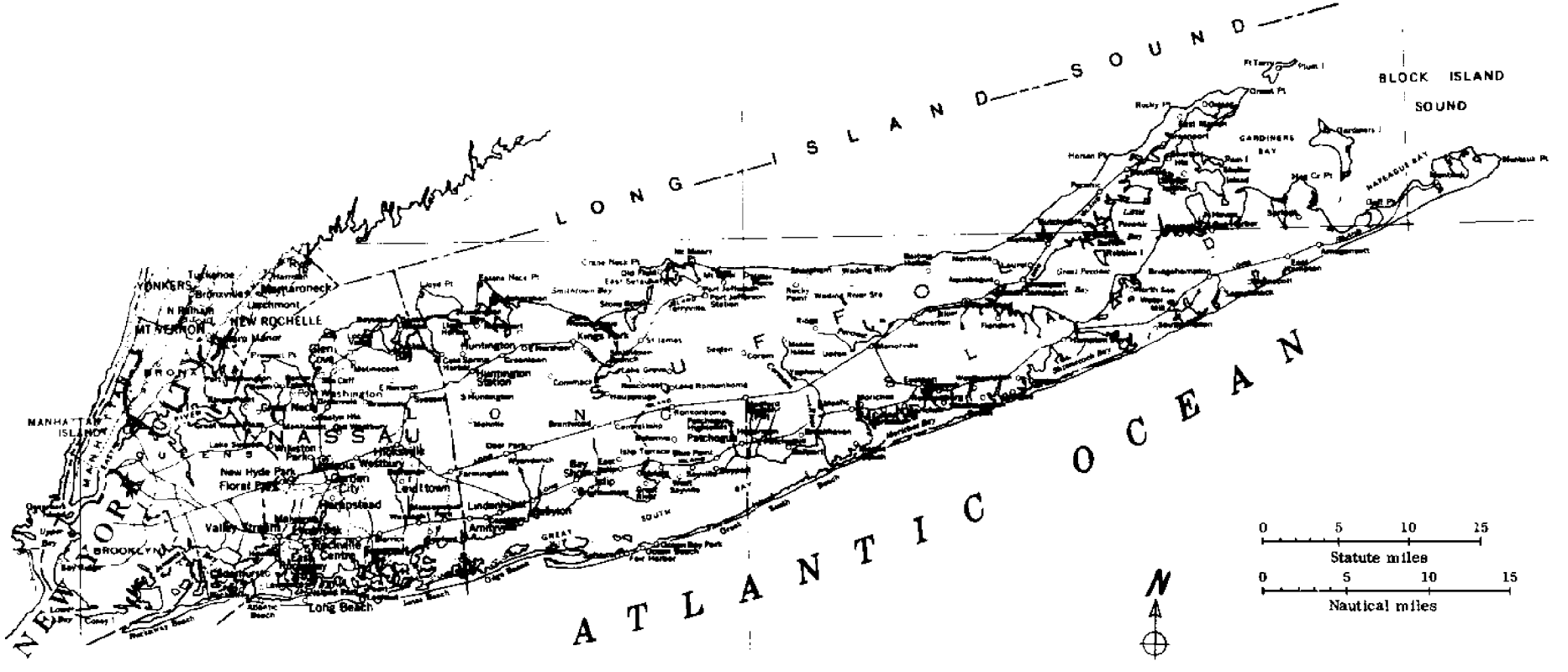

Fig. 1. Nassau and Suffolk Counties, Long Island, New York.

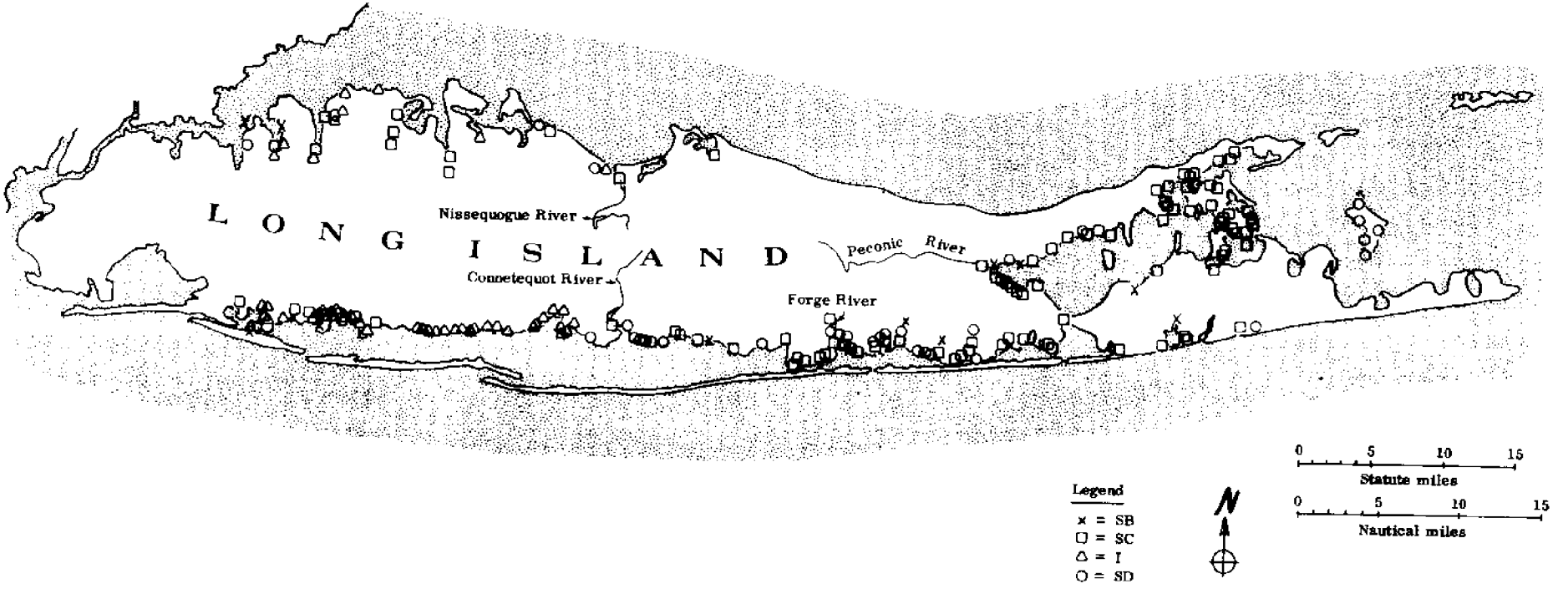

Fig. 2. Water quality classification of coastal waters - Nassau and Suffolk Counties, Long Island, New York. Source: References [8]-[14].

Note: Classification is SA unless otherwise indicated.

A noteworthy source of information concerning the current status of the coastal waters is the New York State Conservation Department. This department, since it is responsible for determining whether waters are legally open for shellfishing, maintains an ongoing field survey program. The Conservation Department has prepared maps showing areas that are classified as SA but are currently closed to shellfishing. Such areas (relevant for March, 1969) are marked in black on Figure 3. In interpreting Figure 3, observe that as a safety precaution, the Conservation Department generally restricts shellfishing in regions subject to heavy traffic by oil bearing ships, and in the vicinity of sewage treatment plant discharges.

Another source of information concerning existing water quality consists of the beach sampling programs carried out by the County Health Departments. Staff engineers from these departments have indicated that the only beaches classified for SA or SB waters that are closed regularly are those in the Little Neck Bay area. In general, all other beaches in Nassau and Suffolk Counties are open except for short and irregular periods throughout the summer months when the coliform counts violate local regulations; the latter require that the most probable number of total coliform organisms be less than 240 per 100 milliliters.

Observe that the following reasons are among those that cause Long Island's coastal waters to be below their classified levels:

- sewage treatment plant effluents,
- cesspool overflows,
- wastes originating on duck farms,
- discharges from pleasure and commercial vessels, and
- overland runoff.

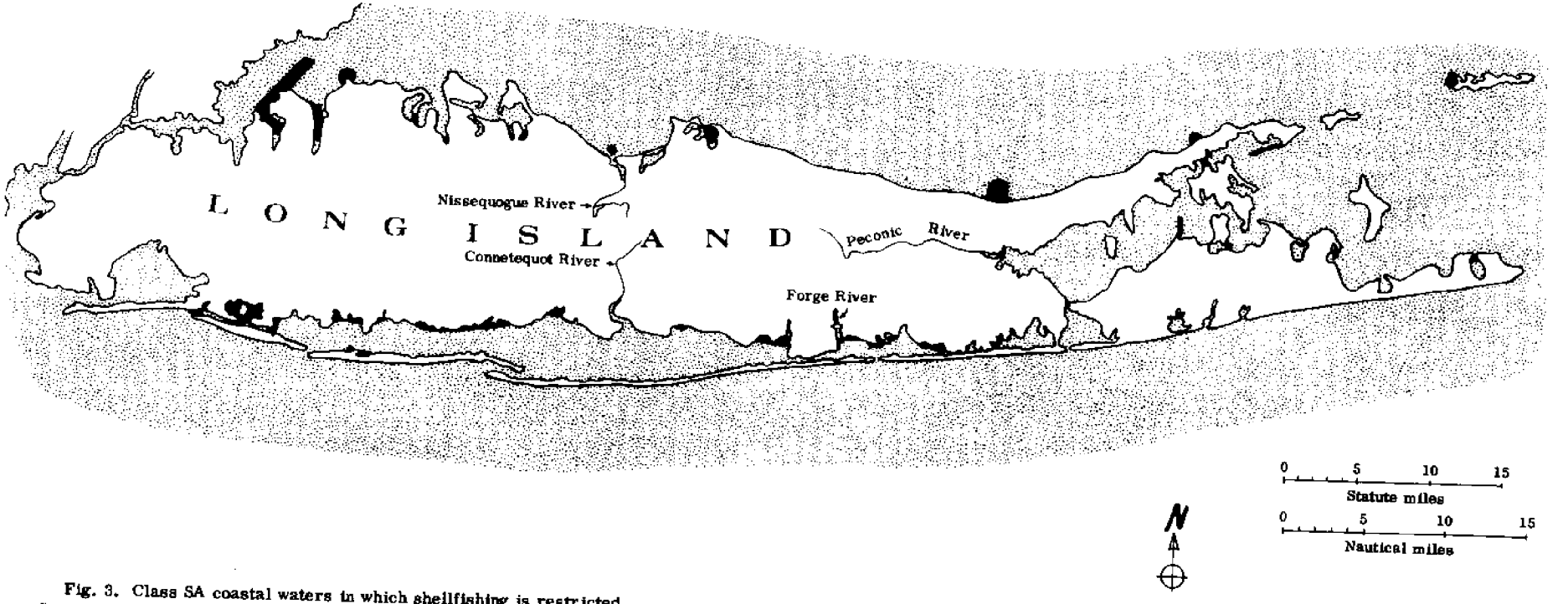

Fig. 3. Class SA coastal waters in which shellfishing is restricted. Source: New York State Conservation Department, Shellfish Sanitation and Engineering Service, Ronkonkoma, N. Y. (unpublished, March 1969).

POSSIBILITIES FOR REFINING THE STANDARDS

There are at least two good reasons why a state might employ very general (or vague) wording for portions of its standards. One is that it gives the administering agency (or ultimately, the courts) the ability to apply the collective judgment and experience of its staff. The need for such flexibility is often defended by citing the difficulty in deriving strict rules that would be relevant under all circumstances for all water bodies. A second reason is that for a number of water quality indicators it would be difficult to obtain agreement from the engineering and scientific community as to what particular numerical limits to employ for the indicator to allow for a specific water use. Note, however, that some form of agreement can often be obtained if there are incentives to do so. For example, numerical temperature criteria and standards were, in many states, adopted only recently in order to obtain final approval of standards from the FWPCA.

The New York standards are vague in many respects; and there are, as suggested above, defensible reasons for allowing them to remain somewhat general. However, standards and classifications are not established once and for all; they are subject to change as new information is made available. The discussion below touches briefly on some portions of the New York standards that might be modified in the interests of precision and comprehensiveness. Note that it would be presumptuous to suggest that the standards should be made more stringent; this is not our intent.

The list below outlines a number of issues which could be dealt with more explicitly in the New York standards as they relate to tidal waters. This list is not the result of an exhaustive study of these issues, but rather it

represents casual observations based on familiarity with the coastal problems of Long Island and the recommendations of the National Technical Advisory Committee on Water Quality Criteria [3].

1) Coliform bacteria

A number of the subcommittees of the National Technical Advisory Committee on Water Quality Criteria recommended the use of fecal coliform as opposed to total coliform as an indicator of contamination from excreta of warm-blooded animals. While the laboratory's procedures for determining fecal coliform are involved, their stronger correlation with pollution from human sources might justify their incorporation in future versions of the standards.

2) Nutrients

It is well known that the bays on the south shore of Long Island are subject to periodic "excessive" growths of aquatic plants due to high inputs of nutrients, i.e., compounds of phosphorous and nitrogen. While it is exceedingly difficult to establish numerical limiting values for such compounds, their importance in controlling excessive growths of aquatic plants suggests that this is an area that should receive continuing attention.

3) pH

The absence of numerical limiting values for pH in the existing standards is a notable omission.

4) Oil

The increasing importance of oil as a pollutant suggests that, for the coastal waters of Long Island at least, a more explicit statement concerning oil might be relevant.

5) Pesticides

In this case, as in the case of nutrients described above, it is rather difficult to obtain numerical limiting values for various pesticides. However, because of the importance of pesticides in the coastal waters of Long Island, a more explicit concern for pesticides in the standards is an issue worthy of consideration.

CONCLUDING REMARKS

Historically, in New York State, water quality standards and classifications have been used primarily to control wastewater discharges. In the context of coastal waters of Nassau and Suffolk Counties this makes them especially useful in controlling the following: municipal and industrial wastewater disposal, sanitary waste from vessels, waste from duck farms, oil pollution, and thermal pollution. The standards and classifications have a much more indirect or implicit role in relation to the following activities: dredging and spoil disposal, wetlands preservation, and solid waste disposal.

There is no reason why a management scheme based on water quality standards and use classifications could not be developed to control or manage nearly all of the human activities in the coastal zone. However, this should not be expected from the New York State standards and classifications as they currently exist, since they were not designed for this purpose.

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