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*RCSI Bulletin 191
Monitoring the Lower Genesee*

*By: Peter Hetzel
November 1975*

THE ROCHESTER COMMITTEE FOR SCIENTIFIC INFORMATION
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Monitoring the Lower Genesee
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Summary

Several governmental agencies and private laboratories sample and test the water in a short stretch of the Genesee River near the outlet into Lake Ontario. There is more testing than required by various federal and state laws. No one is in charge of coordinating the work into a single testing program, but the RCSI found that the quality of water is adequately monitored at present in the lower Genesee River. This report describes all the monitoring programs, and shows the amount of work needed to check the cleanliness of a river. Some of the programs are designed to test for special, short range problems, such as the control of pollution from a single industrial outlet or the control of sanitation at a beach. Some tests are done according to long range plans, and all the results can be analyzed to make a long-term record of the management of water quality in the River.

Introduction

Eleven years ago the RCSI ran its first series of tests of the Genesee River water (1), because little information was available to us on water quality and on sources of water pollution in the River. Today, several organizations are known to sample and test the River. This bulletin answers the following questions:

- Who is testing the water?
- Are resources wasted through duplication of tests?
- Are testers working in coordination with each other?
- How can citizens learn of the results of the tests and the state of the River?
- Is the overall testing program complete, or does it still miss some important elements of water pollution?

Each testing program is described in turn.

Monroe County Agencies

A. Monroe County Health Department

The most complete monitoring program is conducted by the Health Department. Their Stream and Beach Monitoring Program was started in 1966 for the purpose of maintaining a continuous, consistent measure of water quality. Water is tested at 66 stations on 22 streams throughout the County. The Environmental Health Laboratory of the Health Department makes 14 kinds of tests, as shown in Table 2. Results for each testing station are recorded separately, and can be requested for technical use from Mr. G. R. Sutherland, Associate Public Health Engineer, Monroe County Health Dept., Rochester N.Y. 14602. These records contain only

raw data, which are difficult for a layman to use. The same information, however, is sent by the Health Department to the New York State Department of Environmental Conservation's (DEC) Water Quality Surveillance Network in Albany where the data are compiled and summarized. The DEC information is current and available in the form of computer printouts (see description of monitoring by DEC, below).

Mr. Sutherland and his colleagues at the County Health Department prepare summaries and reports of the results of testing as needed for official use. These documents were not ordinarily released for public information. The RCSI found that Health Department personnel were readily accessible and helpful when asked for information, but dispensing information personally is time consuming and can not substitute for a periodic report made public at least once a year. As this bulletin was in preparation, an effectively written report on results of stream monitoring was issued by the Department under Mr. Sutherland's authorship (2).

B. Monroe County Pure Waters Division

This Division operates four large sewage treatment plants, and tests the wastewater released from the plants, but these releases do not go into the lower Genesee River. The Division is also responsible for a network of City sewers leading to the Van Lare Sewage Treatment Plant, and this network polluted the lower Genesee River through combined storm and sanitary sewer overflows. A two year project of monitoring the outfall from the combined sewer overflows will end this fall. Results will be compiled in a report which will be available to the public in December, 1975, according to Mr. Philip Clark, until recently Associate Engineer, Monroe County Pure Waters Division.

Pure Waters is also doing a study for the Environmental Protection Agency (EPA) to test a wet weather management model for the lower Genesee. This will be a short study and will involve testing the river after storms to determine the assimilative capacity of the river.

Both of these studies will help the Pure Waters Division's efforts to get federal funding for building interceptor sewers that would curb the present pollution of the lower river by overflows of raw sewage. The Pure Waters Division publishes an excellent annual report to the County Legislature on the progress of their cleanup of the County's waters. These reports are public documents, on file at the County Legislature Office. The Pure Waters Division has also published documents for the general reader which necessarily contain less information.

C. Monroe County Environmental Management Council (EMC)

The EMC is compiling the existing data on the water quality of the lower Genesee River for specific use in reviewing an expected environmental impact statement (EIS). The Army Corps of Engineers is preparing the EIS for a proposed construction of a dike disposal area for dredged material, and may have it ready in 1976. The EMC findings will be available from Gary Olin, Environmental Engineer, Monroe County Environmental Management Council, 33 South Washington Street, Rochester, N.Y. 14608.

State and Federal Agencies

A. The Water Quality Surveillance Network

The New York State Department of Environmental Conservation (DEC) operates automatic stations which sample water, run tests, and send the results by wire to a computer at DEC headquarters in Albany. The computer prints out the results and is also connected to a "pollution alert" system. Two of the stations are on the Genesee River in the Rochester area: one at Scottsville upstream from the City, and the other near the mouth.

This is the automatic part of the Water Quality Surveillance Network. At other stations in this Network, water is sampled on schedule either by DEC personnel or by subcontractors. There are eight Network sampling stations on the Genesee River between the Barge Canal and the river mouth. They are serviced by the County Health Department as described in paragraph 1, of that section, above.

The results of the tests are processed with the aid of a computer in Albany. The DEC prints full lists of data, as well as statistical summary reports and percentile summary reports for each station (3). As many as 41 different parameters may be reported, but all are not tested at every station. An example of the tests done on the Genesee River is in the Monroe County Health Department column of Table 2. These summaries for a specified geographic area can be requested from:

Ronald E. Maylath, P.E.
Chief, Water Quality Surveillance, Bureau of Monitoring and Surveillance
New York State Department of Environmental Conservation
50 Wolf Road
Albany, N.Y. 12233

The results are summarized in graphic charts for individual stations. The lower Genesee is charted as Region 8, Area 04-01. Three stations were charted in this area to show the measurements over the past ten years (1964-1974). The charts cover fourteen different parameters (see Table 2). There is also a graph of a quantity called the Water Quality Index of the National Sanitation Foundation, which is intended to be an overall measure of water quality (4). These are shown in the Appendix. The higher the number in the Index, the better the water quality.

Finally, an annual water quality inventory is prepared by the DEC as a report to the U.S. Environmental Protection Agency (EPA) and the Congress, in compliance with the Federal Water Pollution Control Act Amendments of 1972. This report covers the whole state (including the lower Genesee) and summarizes the efforts at pollution control during the year (5).

B. The Genesee River Pilot Watershed Study

In 1972, the Water Quality Board of the International Joint Commission between the United States and Canada established the International Reference Group on Great Lakes Pollution from Land Use Activities. The Genesee River watershed is the largest of nine watersheds being studied, under the direction of the Reference Group. The DEC Environmental Quality Research Unit is conducting the study on the Genesee and is concentrating on finding the effects land use has on sedimentation. Their plan consists of a four-part, five-year effort: 1) a review of current knowledge and studies on the effects of land use on water quality; 2) a study of existing land use types; 3) a detailed

survey and sampling of the watershed area to find pollutional sources and determine the relationship between land use and water quality; 4) a study of the effect of the water quality of the river on the water quality of Lake Ontario. A final report is scheduled for publication by the International Joint Commission in January, 1978 (6).

C. International Field Year for the Great Lakes

Between April 1, 1972 and March 31, 1973, the United States and Canada conducted intensive scientific studies on Lake Ontario. Ontario was chosen because it is small but generally typical of the Great Lakes. Therefore, much of what has been learned from the study should be applicable to the management of the other Great Lakes. Several reports are forthcoming and some of them include studies of the Genesee River as well as Lake Ontario. The EPA Regional Office in Rochester (Mr. Kenneth Walker, Director, Rochester Field Office, U.S. EPA, P. O. Box 5036, Rochester, 14627) is currently reviewing some of the manuscripts and will have information on the reports as they are published.

D. United States Geological Survey

The U.S. Department of the Interior Geological Survey monitors the Genesee river at Charlotte Docks as part of the National Stream Quality Accounting Network. This station is among more than 400 stations across the U.S. The program started three years ago and the first reports from the Charlotte station will be available soon from the U.S. G.S. Regional Headquarters in Albany. Contact: John Turk, Water Resource Division, U.S. G.S., U.S. Post Office and Court House, Albany, N.Y.

Private Industries - Eastman Kodak and Rochester Gas & Electric

All industries and municipalities that discharge into surface waters are required by the Federal Water Pollution Control Act Amendments of 1972 to test their discharges for certain constituents. The monitoring requirements are tailored to the discharge of each plant and are written into the plant's NPDES permit (National Pollutant Discharge Elimination System) (7). As far as RCSI knows, only two industries discharge directly into the lower Genesee (others discharge into municipal sewers). Both of these industries, Eastman Kodak Co. and Rochester Gas and Electric Corp., have gone beyond the legal requirements and voluntarily conduct additional water quality studies on the river.

Kodak shares its data with the County Environmental Management Council and EPA and the DEC. This year Kodak is doing a study of the river assimilative capacity for oxidizable material (chiefly organic) for the EPA.

RG & E also reports its data to the EPA and the DEC as required by the discharge permit. The additional information is needed for technical use, in-house, but it can also be obtained on request from Mr. W. Francis, R G & E, 89 East Ave., Rochester, N.Y. 14649.

Private Organization - Delta Laboratories

Delta Laboratories analyze core samples taken from the river every other year. The results are used by the laboratory to establish long-term trends in water pollution of the river. They are available from Mr. Grant Pike, Director, Delta Laboratories, 34 Elton St., Rochester, N.Y. 14607.

Discussion

Table 1 shows the schedule of sampling, the operation costs, and the location of sampling stations. Table 2 shows the water quality elements tested by each regularly monitoring group. The tests reflect pollution caused by erosion and runoff (such as suspended solids), by untreated sewage (such as coliform organisms), and by industrial emissions (such as heavy metals and phenol). They show the mineral content of the water and some of its biological characteristics. Major discharges of some duration from any source into the river should be picked up by these tests.

Additional kinds of tests may prove to be necessary in the future. Specifically, the EPA is preparing to control hazardous and highly toxic substances, and it may become necessary to test for such pollutants as polychlorinated biphenyls, primarily because of concern with drinking water supply.

There are some duplications of tests by different laboratories, but in the opinion of RCSI the amount of testing is not excessive and the duplications are not wasteful. They help the laboratories check their work against that of others. Furthermore, good communication between the County Health Department and the other testing groups was brought to light by our interviews.

References

- (1) Berg, G., *"Second Report on Water Pollution"*, RCSI Bulletin #2, November 1964
- (2) Sutherland, G.R., J.N. Andersson, R.S. Elliot, and Richard Burton, *"A Report on the Stream Quality Monitoring Program of the Monroe County Department of Health"*, Monroe County Department of Health, October, 1975
- (3) Hetzel, Peter, *"Water Quality Trends in the Genesee River Basin and Lake Ontario Basin in Monroe County"*, Contribution #54 of the Environmental Resource Center, Geneseo, N.Y., July 1975
- (4) Brown, R.M., N.I. McClelland, and R.A. Deininger, *"A Water Quality Index for Water Quality Management"*, National Sanitation Foundation, Ann Arbor, Michigan, April 1973
- (5) Seebald, E.F., *"New York State Water Quality Inventory Report"*, New York State Department of Environmental Conservation, April 1975
- (6) Hetling, L.J., *"Genesee River Watershed Study Description and Detailed Work Plan"*, New York State Dept. of Environmental Conservation, Nov. 1974
- (7) Hetzel, Peter, *"Control of Pollution Discharges in Monroe County"*, RCSI Bulletin #188, July 1975

Table 1. Schedule, Cost, and Location of Monitoring

	<u>Schedule</u>	<u>Yearly Budget</u>	<u>Number of Stations</u>	<u>Location</u>
Monroe County Health Dept.	weekly from late May until early Sept. 1966 -	\$2,500*	8	Stutson St., Genesee Docks, St. Bernard's, Veterans' Bridge, RG & E Headgates, Holiday Inn, Court St., Clarissa St.
Pure Waters Div.	1973-1975		8	Maplewood Park, Norton St., Lexington St., Cartledge St., two on the Upper Falls, Court St., two on Brooks Ave.
U.S. Geological Survey	1973 - Eight monthly samples (none in winter)	\$2,000	1	Charlotte Docks
Kodak	biweekly	not available	4	A couple above the Kodak discharge and a couple below
RG & E	weekly	\$10,000	1	below the Beebee Plant discharge
Delta Labs	1971 - once every other summer			Take 6 to 8 core samples between Stutson St. and Driving Park bridges

* This is the estimated cost of operating the eight monitoring stations on the lower Genesee River. The Beach and Stream Monitoring Program operates at a cost of \$32,000 a year.

Table 2. Water Quality Parameters Measured for by Monitoring Groups

	<u>Monroe County</u> <u>Health Dept.</u>	<u>U.S. Geol.</u> <u>Survey</u>	<u>Kodak</u>	<u>RG & E</u>	<u>Delta</u>	<u>DEC</u> <u>(graphs)</u>
Silica		X				
Calcium		X				
Magnesium		X				
Heavy metals	X*	X	X		X**	
Chloride	X			X		
SO ₄	X					
Total phosphorus	X	X	X			X
Ammonia						X
Nitrate nitrogen	X	X				X
Dissolved oxygen	X					X
Biochemical oxygen demand	X		X			X
Anions		X				
Cations		X				
Turbidity	X	X		X		X
Dissolved solids		X				X
Suspended solids		X	X			X
Organic carbon		X				
Hardness		X		X		
Color	X					
Temperature	X			X		X
pH	X		X			X
Alkalinity	X			X		
Phytoplankton		X				
Periphyton		X				
Total coliform	X		X			X
Fecal coliform	X	X	X			X
Fecal strep	X	X				
Flow	X		X			X
Phenols			X			X

* Assembled data include scattered tests by EPA (1969-1974) for cadmium, lead, mercury, and zinc. The Health Department's own testing (1973-1974) was a systematic profile of the Genesee River below Ballentine Bridge for cadmium, lead, and zinc.

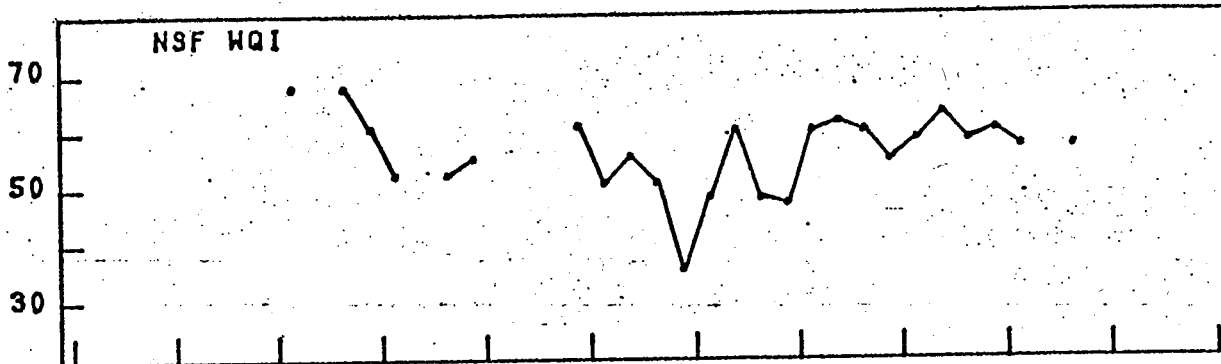
** Core samples are tested for lead, cadmium, nickel, copper, chrome, zinc, magnesium and iron.

Appendix. Graphic charts showing the Water Quality Index of the National Sanitation Foundation at Station 04-0001, 04-0003, and 04-0004 on the Lower Genesee River.

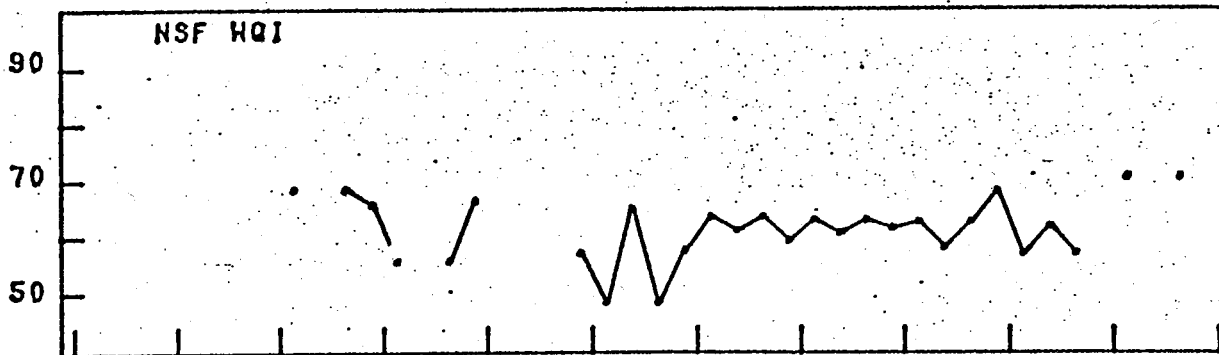
Station Locations: 04-0001 Boxart Street
 04-0003 Driving Park Ave. Bridge
 04-0004 Elmwood Ave. Bridge

Medium quality water is 50 to 70 on the index; good is above 70; poor is below 50.

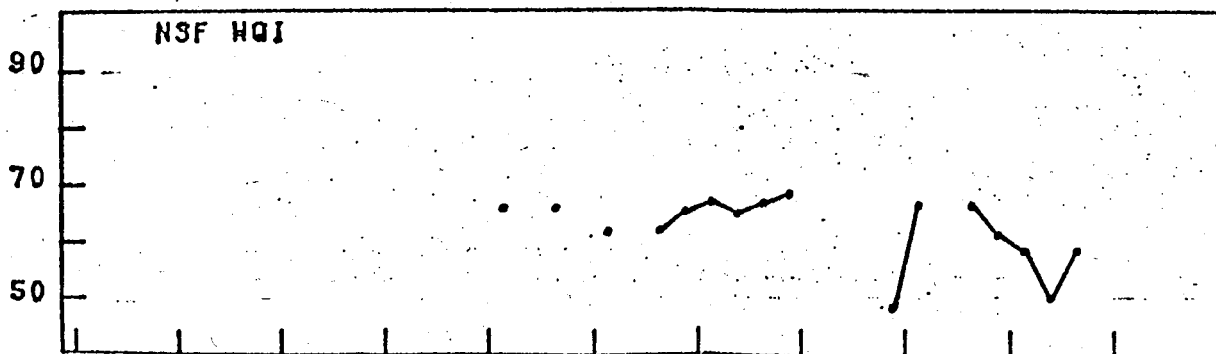
04-0001 AREA 04-01 CLASS B H.P. 2.6
 GENESEE RIVER AT ROCHESTER



04-0003 AREA 04-01 CLASS B H.P. 6.1
 GENESEE RIVER AT ROCHESTER



04-0004 AREA 04-01 CLASS B H.P. 11.0
 GENESEE RIVER AT ROCHESTER



1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974