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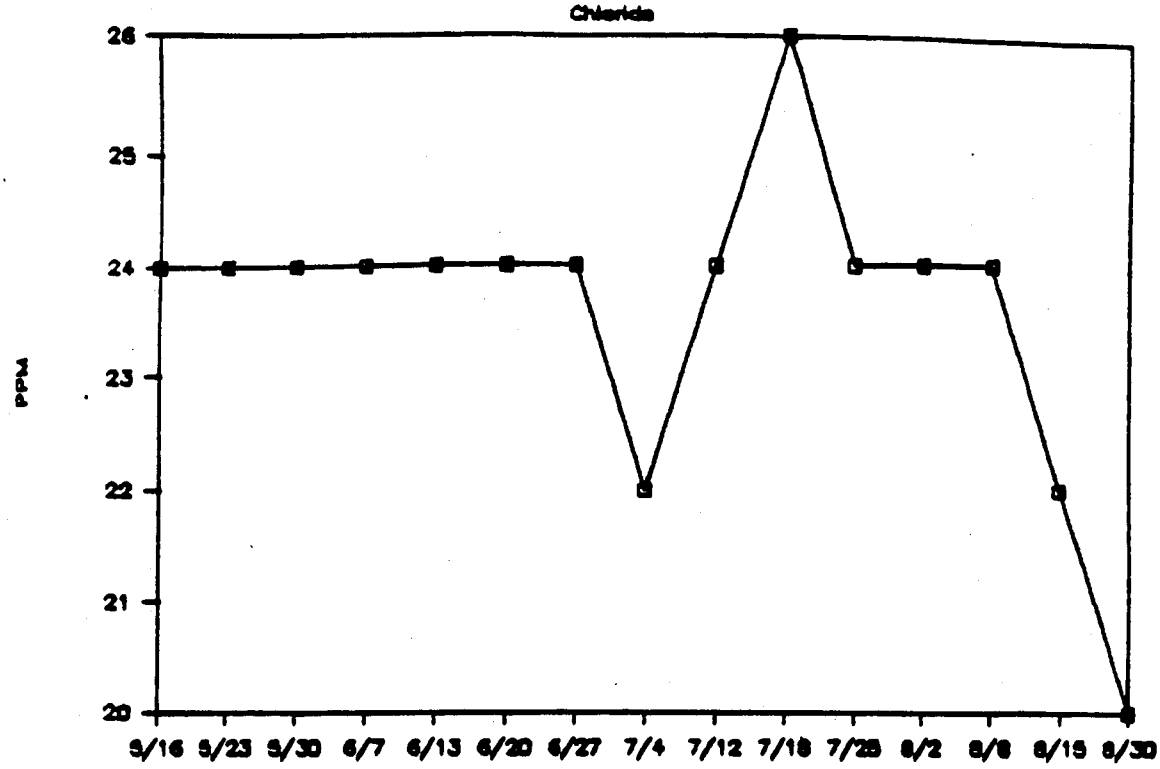

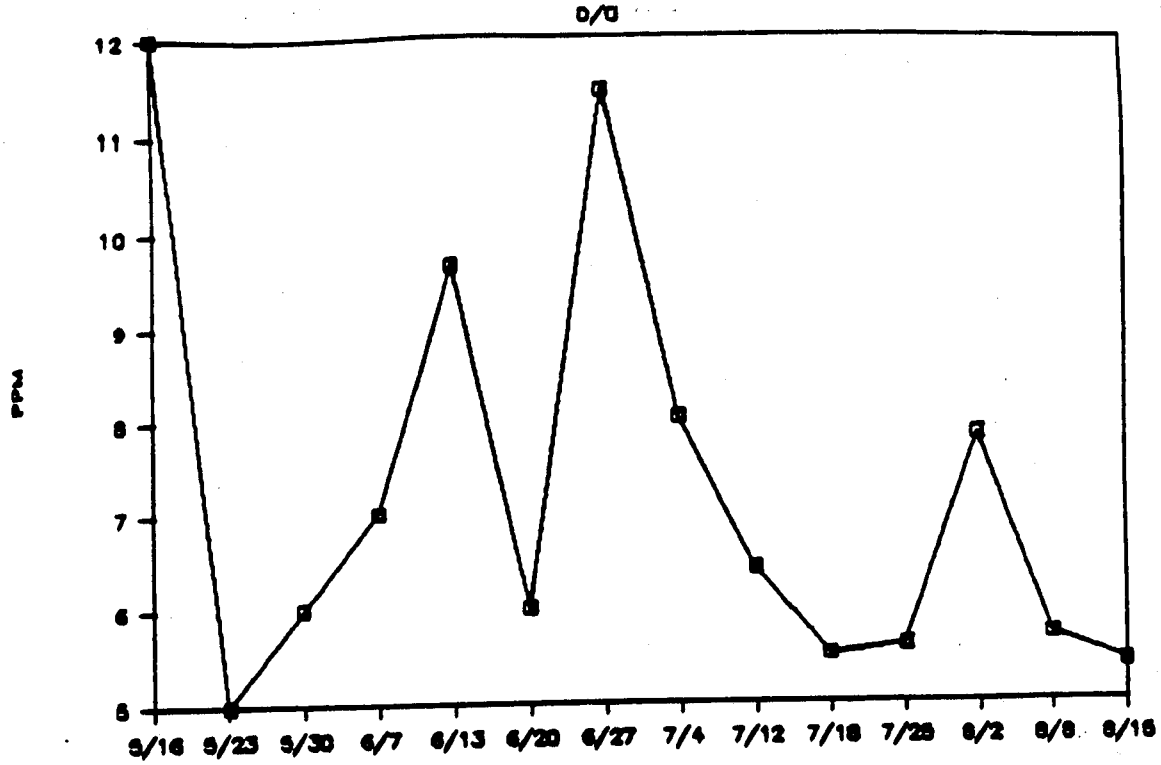
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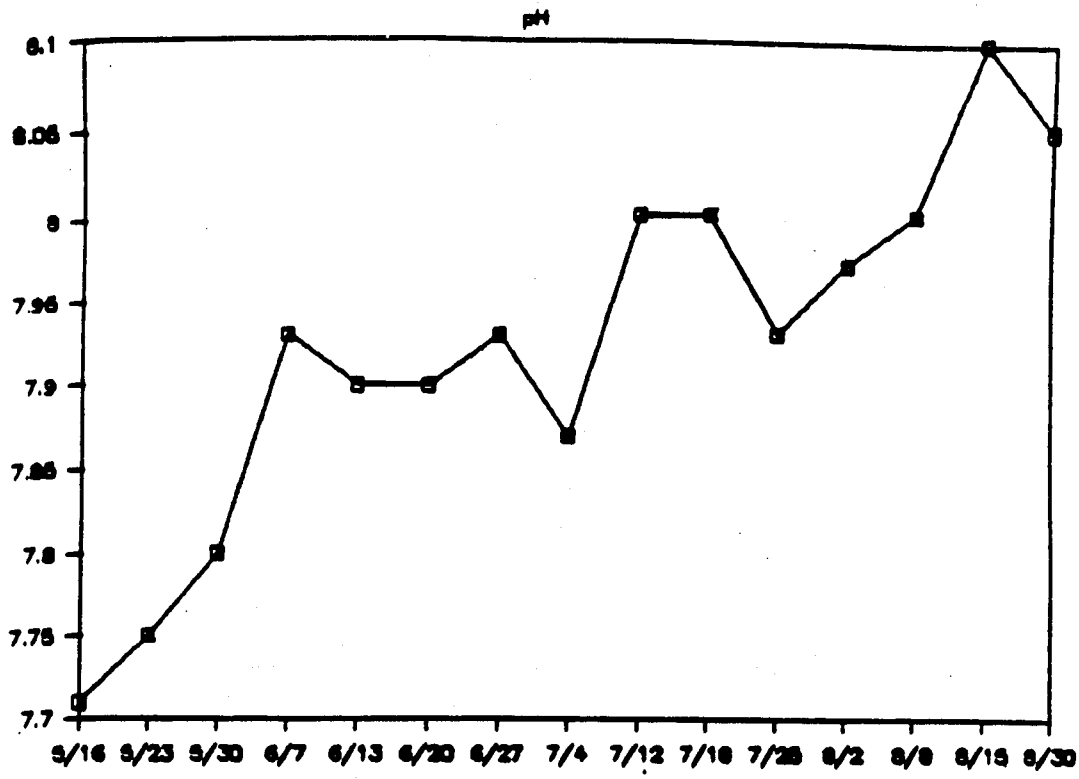

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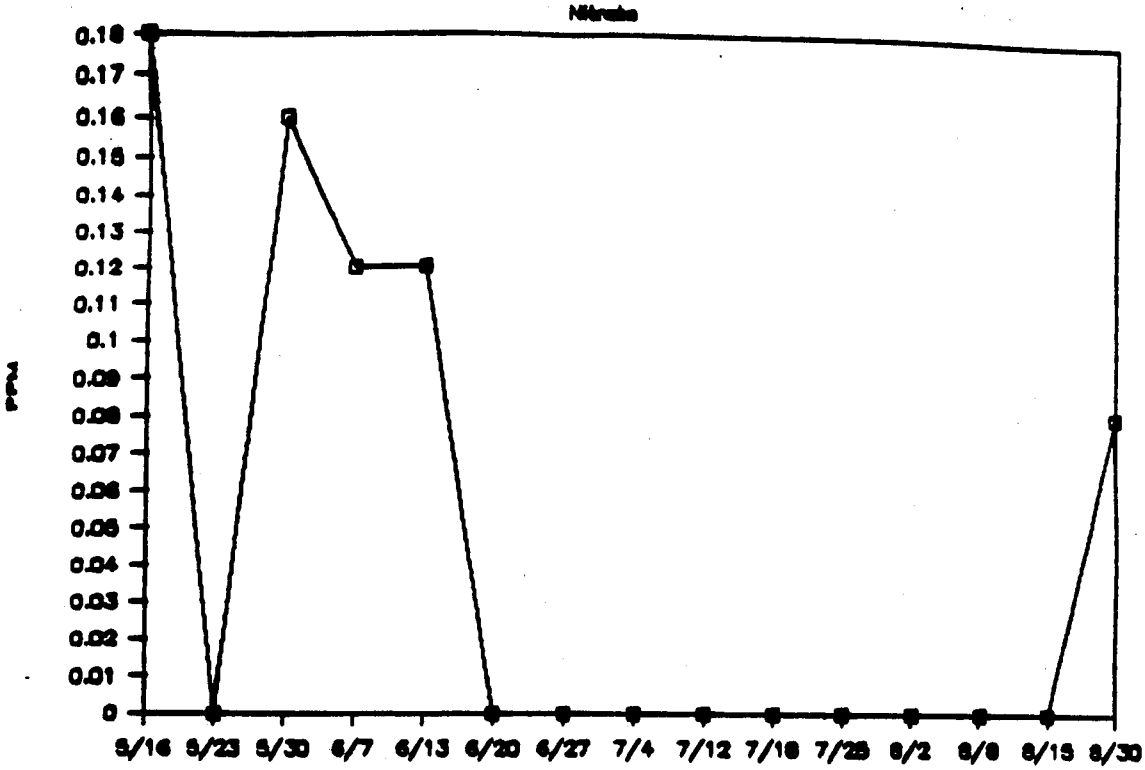

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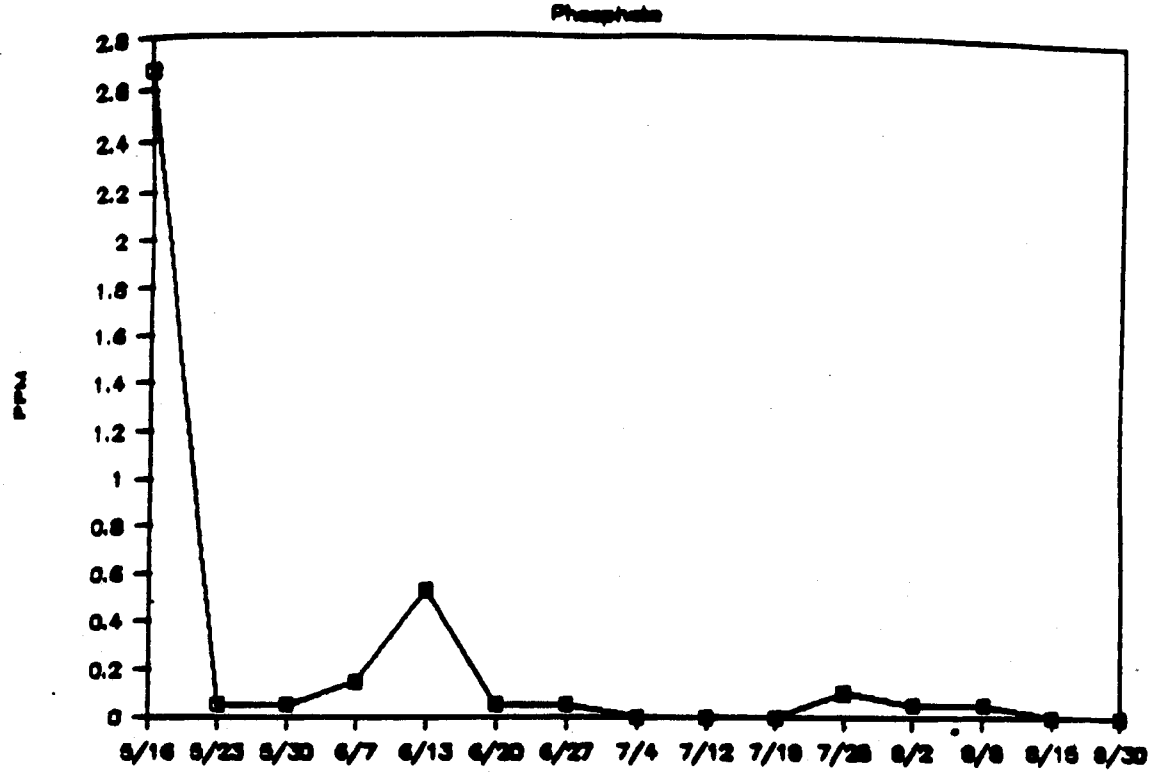

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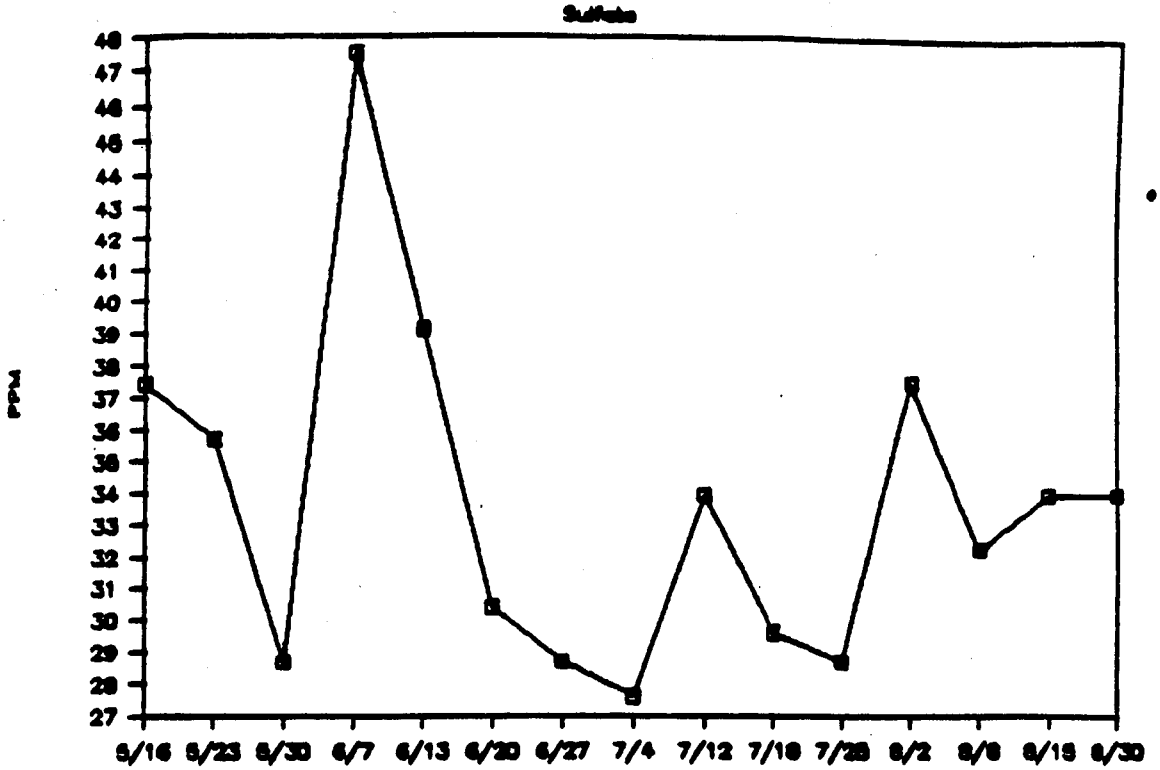

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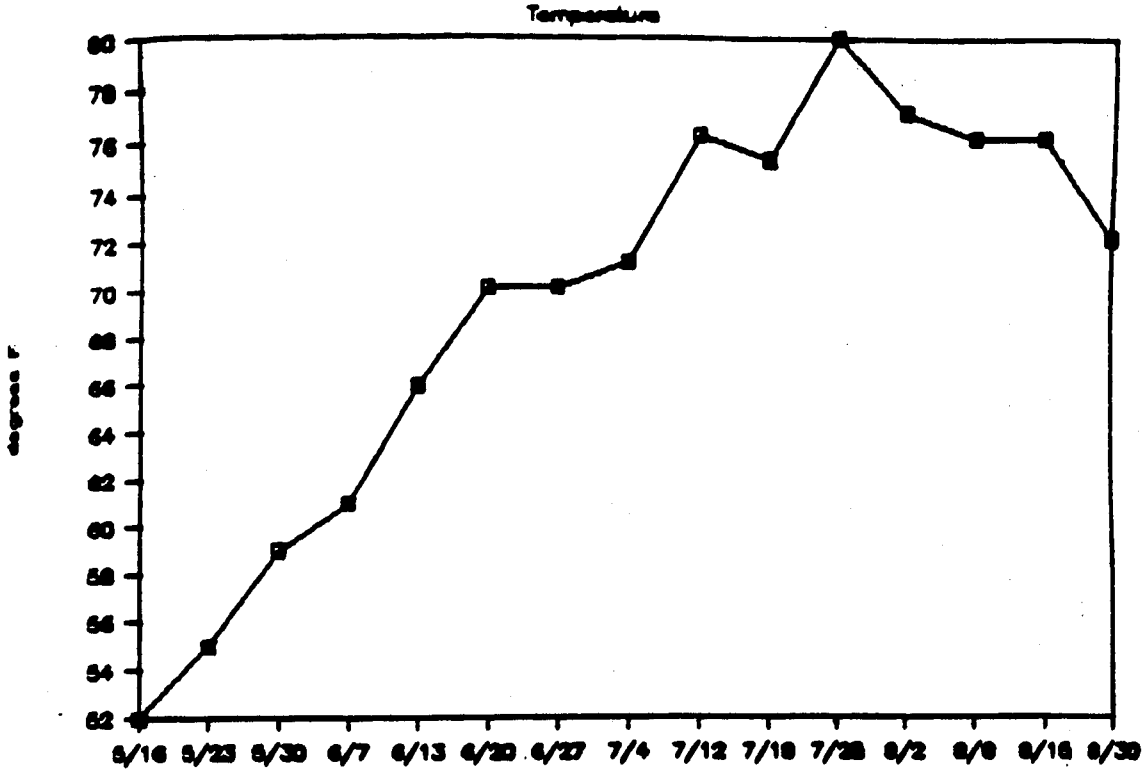

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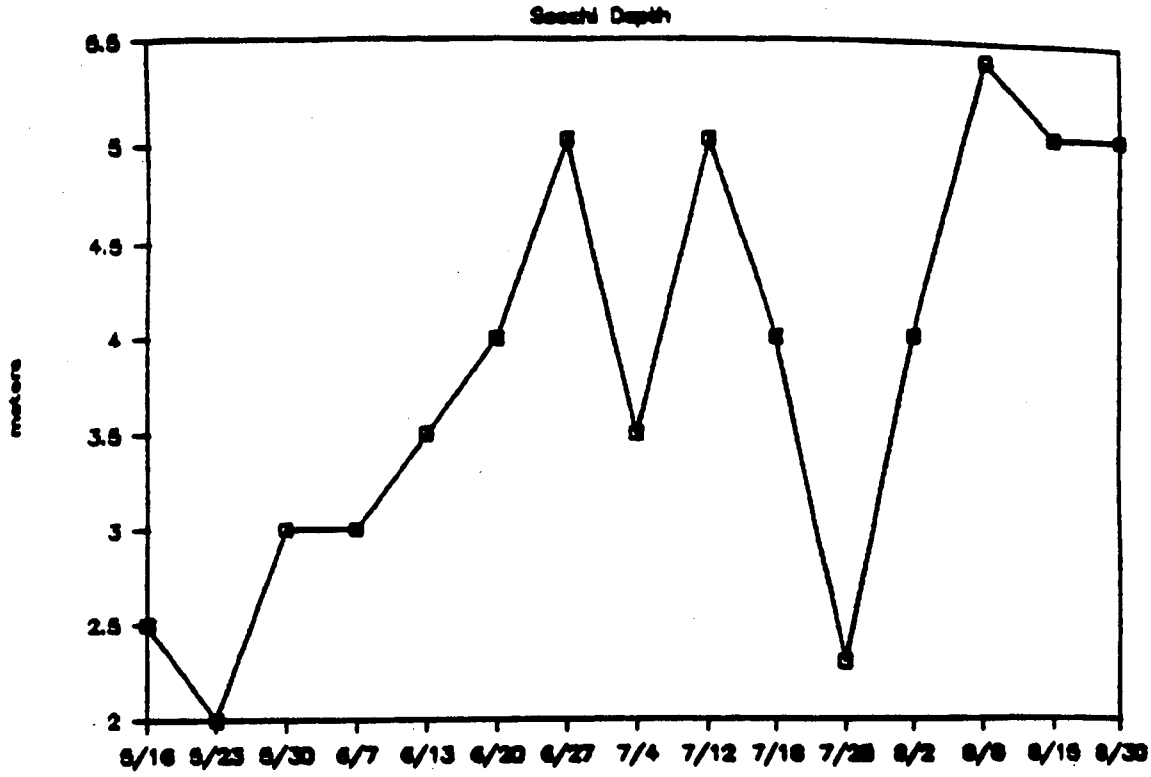

YATES COUNTY AQUATIC VEGETATION CONTROL PROGRAM
1989 ANNUAL REPORT

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January 1990

CONTENTS

INTRODUCTION

The purpose of this report is to document the work done in 1989 by the Yates County Economic Development and Planning Office (YCEDP) and the Yates County Soil and Water Conservation District (YCSWCD) to control nuisance aquatic vegetation and to maintain the quality of the three local lakes. The report will serve as a permanent record of 1989 accomplishments under the Yates County Aquatic Vegetation Control Program (YCAVCP) and will provide information to those interested in the quality of Yates County's lakes.

The primary goal of the Aquatic Vegetation Control Program is to maintain the quality of the lakes for recreation, drinking water, and their scenic beauty. The program uses both short-term and long-term approaches to reach this goal. Short-term control of nuisance vegetation is achieved through harvesting. Harvesting provides immediate benefits for recreationists while more permanent solutions to water quality problems are implemented. Long-term approaches emphasize planning for appropriate future land use and include: erosion control programs for roads and farms; water monitoring programs to assess nonpoint source pollution problems; the development of a Geographic Information System (GIS) to help county and town decision-makers make informed land use regulation decisions and to develop a land use plan for the county; and the formation of a Keuka Lake Watershed Protection District which would provide uniform septic system and land use regulations around the lake.

The Yates County Aquatic Vegetation Control Program is funded by Aid to Localities funds which are enacted yearly by the New York State Legislature. Eighteen counties in the Finger Lakes region receive funding for aquatic vegetation control programs. The Water Resources Board of the Finger Lakes Association fosters cooperation between these counties and represents the counties in matters with the state and with other lake management organizations.

Significant progress was made in 1989 despite mid-year funding problems which halted several projects and delayed the start of others. Through YCAVCP efforts and the continued efforts of others, the people of Yates County and New York State will enjoy quality recreation, clean drinking water, and beautiful scenery.

AQUATIC VEGETATION

Aquatic vegetation growing in natural conditions and density provides many benefits. It provides food, shelter, and reproduction sites for aquatic organisms. Vegetation is also an important component of nutrient and gas cycling. It produces oxygen and carbon dioxide.

Profuse aquatic vegetation growth results from human activities in an ecosystem and has many detrimental effects economically, environmentally, and recreationally. Economic effects of profuse growth may include: decreased property values; a decreased tax base; decreased tourism; a decline in the fisheries; increased water filtering expenses; and increased boat maintenance expenses. Environmental effects include: decreased water circulation which leads to increased siltation and warming; decreased oxygen levels at night which may be lethal to fish; and, if weeds become thick enough, fish growth and reproduction may be hindered. Recreational problems include: inability of boats to navigate and people to swim; decreased shoreline use due to odiferous piles of rotting vegetation which wash on shore; and loss of scenic beauty when debris is trapped in the emergent vegetation.

CULTURAL EUTROPHICATION

Eutrophication is normally an extremely slow process in which an aquatic environment becomes terrestrial. A lake fills with sediment over thousands of years and vegetation becomes more terrestrial as the lake fills. Eutrophication is a natural aging process which occurs in all water bodies.

Profuse aquatic vegetation growth is a symptom of cultural eutrophication. Cultural eutrophication is an acceleration of the natural aging process caused by human activities such as farming, logging, road building, and land development. Any human activity which disrupts the soil cover and causes erosion will increase the amounts of nutrients and sediments washing into lakes. Nutrients, especially phosphorus, and sediments, which provide a substrate for growth, cause the explosive growth of aquatic vegetation. Nutrients may also come from sewage and septic effluents, lawn and farm fertilizers, urban runoff, and industrial discharge. So, in addition to the immediate problems caused by an overabundance of aquatic weeds, excessive weed growth is also a sign that our lakes are aging more quickly than they should.

CURRENT SITUATION

Yates County contains large portions of three Finger Lakes - Canandaigua, Keuka, and Seneca which have a combined surface area of 99.8 square miles (see map-Appendix A). Yates County has approximately 65 miles of shoreline. All three lakes are used for public water supply, swimming, boating, and fishing. Keuka and Canandaigua are classified AA. Seneca is classified B at the northern end, the southern end, and at the Keuka Outlet in Dresden and it is classified AA elsewhere. The watersheds of the lakes typically contain farmland, forest, villages, residential areas, summer camps and lake-side cottages, and brushy, abandonned farmland.

Residents of Keuka Lake began to report weed problems several years ago. Gaylord Rough of Alfred University has surveyed the vegetation on Keuka Lake several times. His last survey was conducted in 1987. He concentrated on locating areas where dense populations of weeds caused navigation problems. The species causing the most navigation problems were milfoils (Myriophyllum sp.) and pondweeds (Potamogeton sp.). Rough found that the weeds usually occured in dense, isolated beds near shore. Most beds were small but there were some large beds.

Ninety-five percent (95%) of the weeds removed from Keuka Lake during 1988 and 1989 harvesting seasons were Eurasion milfoil. Informal, pre-harvest surveys conducted in June found the beds were small, dense, and isolated in most cases. Eurasian milfoil, an introduced species, can dominate native species and expand rapidly. It often grows 15 ft. tall and most of its biomass is near the surface. It grows very vigorously in Keuka Lake and usually reaches the surface by mid-summer. Eurasion milfoil seems to florish especially well in shallow bays.

Aquatic vegetation on Canandaigua Lake occurs primarily in localized beds at intermittent streams, according to interviewed residents. However, an informal pre-harvest survey conducted in May found serious problems only at the south end of the lake at the mouth of the West River. The nuisance weed in this area is a type of pondweed whose growth peaks in June and then it dies back.

Surveys of Seneca Lake in July 1989 found only a few scattered, thin beds at intermittent streams. These beds posed no threat to navigation and were often in strips only a few feet wide at the drop-off.

SHORT-TERM CONTROL

Harvesting provides immediate, temporary relief from weeds for boaters and other recreationists. It also removes nutrients from the ecosystem so they are not available for weed growth the next season. Harvesting may also disrupt the translocation process which moves carbohydrates to the roots for the winter. Disrupting translocation may decrease root vigor and thus growth in the next season. Harvesting often increases plant diversity and encourages native vegetation to reinhabit areas now dominated by exotic species.

Only near shore beds which prohibit use of the lake are harvested thus assuring the availability of less dense beds for fish propagation.

1989 AQUATIC VEGETATION HARVESTING

Mechanical harvesting with the county owned equipment began on June 1, 1989 on Canandaigua Lake.

The southern end of Canandaigua Lake along the Yates County border supports an extremely dense growth of aquatic plants due to sediment and nutrients deposited by the West River. Residents and others were unable to use this section of the lake because the weeds were so dense.

To provide access to the lake, an area parallel to shore and extending 200 feet into the lake was harvested. Between June 1 and June 14, 1989, approximately 50 tons of vegetation were harvested from five acres. This harvesting also provided accessible 'edge' for fishing.

Keuka Lake was treated next for nuisance aquatic weeds. Areas with the heaviest concentrations included Camp Corey, Brandy Bay, Camp Iroquios and Branchport. Dozens of additional localized areas of excessive growth that were hindering use of the lake were also treated. Approximately half these areas of concentrated growth were the result of sediment and nutrients being delivered to the lake from the surrounding hillsides via intermittent streams and gulleys.

Harvesting took place on Keuka Lake from June 20 to September 15, 1989. Approximately 200 tons of vegetation were removed from approximately 30 acres.

All of the harvested material from both Keuka and Canandaigua Lakes was disposed of upland to remove nutrients from the lakes and thereby retard future weed growth.

For a small scale map of harvested areas, see Appendix B. More detailed, larger scaled maps are available from YCEDP.

LONG-TERM SOLUTIONS

The YCAVCP has initiated many long-term planning and regulatory activities to reduce the amounts of nutrients and sediments entering the lakes. These activities address the causes deteriorating water quality while harvesting treats only a symptom.

PROPOSED KEUKA LAKE WATERSHED PROTECTION DISTRICT

A committee composed of town supervisors, county legislators, village mayors, lake association members, watershed inspectors, and concerned citizens has been working on the formation of the Keuka Lake Watershed Protection District since mid-1988. The proposed District would include six towns, two villages, and portions of two counties. It would be financed by weighted payments from the towns, water use fees from villages, and by fees for services. It would be managed by a board of commissioners whose members would be appointed by the towns and villages.

The main purpose of the proposed District would be to standardize septic system regulations and inspections across political boundaries. More stringent regulations and inspections would decrease the amount of septage entering the lake and causing weed growth. The District would also regulate lake levels, and docks, decks, and piers.

Like other special use districts, the Keuka Lake Watershed Protection District would require legislative approval from the New York State Legislature. (For a summary of the draft legislation and a map of the proposed District see Appendices C and D respectively.)

In the beginning of 1989, the committee met at least monthly to solidify the purpose and structure of the District. They also began to develop an equitable payment system based on population, shoreline, tax parcels, assessed values, etc.

The committee began to give presentations on the proposed District in the late spring. The first presentations were made to town boards. Most town officials, while they saw the value of a Watershed Protection District, felt the cost was just high. The committee then decided to re-evaluate the District's budget.

The committee, at the end of 1989, was still in the process of reducing the budget to a level the towns would be willing to pay. They were also considering higher water use fees for villages. The committee suspended presentations on the District until the budget is modified.

In 1990, the committee will gain support for the district from all six towns and two villages. Then, Sen. Randy Kuhl will introduce the legislation to the state Senate.

WATER QUALITY MONITORING

The YCAVCP conducted two water quality monitoring programs in 1989 to better understand nonpoint source pollution that may affect Yates County's water quality.

Tributary Monitoring. The YCAVCP has been monitoring eight Keuka Lake tributary sites since 1987. (For a map of tributary sampling sites, see Appendix E.) The collected samples were analyzed for: Ammonia as N, Nitrate, Nitrite, Total Phosphorus, Orthophosphate, Potassium, and Suspended Solids. Estimates of stream flow volume were also made.

Background samples, collected monthly from April 1987 through May 1988, showed few significant nutrient levels. Since then, samples have been collected only during significant run-off events. Many studies have indicated it is during these events most nutrients enter lakes.

In 1989, samples were collected during one run-off event on March 30.

The average nutrient levels for all eight sites on March 30, 1989 were as follows:

Ammonia as N - <0.05 mg/L (standard deviation - 0)
Nitrate - 6.8 mg/L (stan. dev. - 2.8)
Nitrite - .8 mg/L (stan. dev. - .85)
Total Phosphorus - 1.282 mg/L (stan. dev. - 1.079)
Orthophosphate - .07 mg/L (stan. dev. - .098)
Potassium - 3.57 mg/L (stan. dev. - 1.39)
Suspended Solids - 18.99 mg/100ml (stan. dev. - 23.28)

All tributary nutrient data has been forwarded to Dr. Ray Oglesby of Cornell University and Dr. J. Wills of Corning Community College for interpretation. Dr. Oglesby will give us a first order interpretation and then either assist us further or find a graduate student to help us. Dr. Wills is looking at our data in conjunction with data collected by members of the Keuka Lake Association.

In 1990, the tributary monitoring program may be modified based on recommendations from Dr. Oglesby and Dr. Wills. It is a concern that the current sampling method does not adequately assess nutrient levels during the run-off event. Also, another sampling site may be monitored in a subwatershed which is undisturbed by development or agriculture. This data would be used to compare "natural" nutrient and sediment loads to those in the subwatersheds currently being monitored.

In-lake fecal coliform monitoring. In-lake fecal coliform sampling first began in 1987 when several hand-picked sites on Keuka Lake were sampled on two separate occasions. It was thought that failing septic systems might be contributing significant amounts of nutrients to the lake. (A Septic System Survey completed by the YCAVCP indicates many septic tanks on Keuka Lake are old and undersized and therefor vulnerable to failure.) Fecal coliform levels on these two occasions indicated a need for further monitoring and in 1988 and 1989 samples were collected from Keuka Lake in a more rigorous manner.

In developing the sampling method, the lake was first divided into quarter mile numbered segments. On each sampling day (generally a Monday), 40 random collection sites would be chosen using a random numbers table to select a quarter mile segment and an address within that segment. A near shore grab sample was collected at each site, labelled, and packed in ice. Two duplicate samples were collected each day and two distilled water samples were also submitted to the lab as controls. The samples were analyzed by R and J Laboratories of Penn Yan, NY. This sampling method is not meant to pinpoint individual septic system failures but to indicate the potential severity of nutrients entering the lake from fecal coliform sources such as failing septic systems.

Samples were collected in late summer of 1989 on these four separate dates using the method outlined above: 08/14/89, 08/28/89, 09/05/89, and 09/26/89. The results are summarized below:

No. of Colonies/100ml	% of samples in category 08/14/89	08/28/89	09/05/89	09/26/89
<1	8%	74%	27%	33%
1 - 4	0%	21%	34%	5%
5 - 50	28%	5%	32%	14%
51 - 200	46%	0%	7%	10%
201 - 1000	13%	0%	0%	29%
1000+	5%	0%	0%	10%

The following standards should help put these numbers in perspective:

Maximum for community water systems: 4 colonies/100ml
Maximum for raw water prior to treatment: 50 colonies/100ml
Allowable rate for natural inland waters: 200 colonies/100ml
Maximum for primary contact recreation: 200 colonies/100ml

This data indicates, under certain conditions, failing septic systems may be contributing significant weed promoting nutrient loads and pathogens to the lake. Also, elevated fecal coliform levels may pose health risks to those consuming untreated lake water. The data suggests that days with higher levels may be the result of rain saturating the thin lake shore soils and transporting septic tank effluents to the lake.

All fecal coliform data from 1987, 1988, and 1989 has been forwarded to Dr. Ray Oglesby of Cornell University and Dr. J. Wills of Corning Community College for further interpretation. The fecal coliform sampling program will be modified in 1990 based on their recommendations. Until a sampling method which clearly indicates the sources of high fecal coliform levels is indentified, an education program for lakeshore residents is being developed. The program will explain the impact of inadequate septic systems on lake water quality and provide information on septic system maintenance and correcting inadequate systems.

GEOGRAPHIC INFORMATION SYSTEM

The YCAVCP puchased computer equipment in late 1988 and began developing a Geographic Information System in 1989.

A Geographic Information System, or GIS, is a computer system which stores geographic features such as roads, streams, or soil types, along with pertinent data for each feature. For example, a GIS not only stores the location of a stream but also information about that stream such as class, width, average flow, etc. A GIS also stores features' relative locations on the earth's surface so that different feature types covering the same area can be overlayed or adjacent maps can be joined. A GIS can perform various analyses by selecting features or land areas which meet certain criteria. A GIS is a good communication tool because patterns on a map are often much easier to see than patterns from graphs or tables.

GIS development is still in the data entry stage. Maps must be digitized, checked for accuracy and then the tabular database must be developed to accompany the map. Data entry is a very long process which often represents 70% of long term GIS costs. Some files (including roads, hydrography, political boundaries, school districts, and railroads) were received from the State Division of Equalization and Assessment. Although the files required some editing and database development, they have saved substantial time.

Several data layers were developed in 1989. Files include: State lands, classified wetlands, and water and sewer lines. Many tax maps were entered by a technician from the Yates County Real Property Tax Office but the files still require development before they are useful beyond display purposes.

Soil maps and topography will be important components of the GIS and this data will be entered in 1990. The County soil maps are currently inaccurate because they were made before the development of orthophotography and do not adequately account for topography. It would be a waste of time and money to digitize the soil maps in their present condition so they will be recompiled onto a planimetrically correct base which will account for topography. The USDA Soil Conservation Service in Pennsylvania (USDA-SCS-PA) will recompile the maps and the USDA-SCS-NY will develop the tabular database to accompany the maps. Work on this project began at the end of 1989 and, in 1990, the soil maps as well as the topography maps will be digitized by an outside contractor. Other data to be entered in-house includes: current land use, current land cover, and zoning ordinances.

The GIS will be used for the County Land Use Plan described below. It will also be used to interpret water quality data and to track weed beds and harvesting patterns. It may also be used as a tool to locate lakeshore segments with high potential for septic system failures.

The GIS has several advantages over traditional methods of executing our intended projects. It can help us make better decisions because more information is available and it is easily accessible. Also, the system can help clearly explain decisions to the public because of its graphic capabilities. Projects can be completed more quickly and at less expense.

YATES COUNTY GROWTH MANAGEMENT PLAN

The YCAVCP is especially excited to be part of an innovative land use planning project. The AVCP funds have been used to leverage $6,000 from the NYS Council on the Arts and $25,000 from the Kaplin Foundation to hire Roger Trancik, ASLA, of Cornell University to develop a Growth Management Plan. Mr. Trancik is well known for his planning work in rural counties. The YCAVCP's interest in the project is to control inappropriate development which is damaging the lakes. The Council on the Arts funds will be used to give historical resources special consideration in the Plan. The Kaplan Foundation funds will be used to publish a book about the project.

The Growth Management Plan will provide plans for each of the nine towns in Yates County and county-wide guidelines with site review criteria and generic tools for implementation. The purpose of the plan is to protect the natural environment, especially the lakes, of Yates County by preventing inappropriate development. The plan should also preserve the rural character of the county while allowing controlled development.

Work on the plan began in 1989 by forming Growth Management Committees. The first committee formed consists of representatives from the four western towns: Jerusalem, Italy, Potter, and Middlesex. Committee members from the five eastern towns (Milo, Benton, Torrey, Starkey, and Barrington) were still being recruited at the end of 1989. The committees have three important functions. First, they will provide specific town information to be used in the plan for their town. Second, they will react to and comment on the planning model process. And third, they will interact with town boards and town planning boards informing them of project progress and relaying the boards' comments or concerns back to Mr. Trancik.

The Planning Model was also developed in 1989. The Planning Model will be used to coordinate town planning efforts into a systematic approach for the whole county. It is a step by step process which will be followed throughout the project. In Step 1, area resource data maps will be made. One map will show steep slopes, streams, wetlands, public spaces, and open lands in prime agricultural use. Another map will show forests, open or transitional land, settlements, commercial/industrial sites, institutional uses, and historic resources.

In Step 2, an attempt will be made to place value on scenic resources. Areas of highest scenic value will be mapped based on criteria similar to the SCS Scenic Assessment Criteria which were adopted by the IRS to determine tax deductions for scenic easements donated by landowners under the 1986 tax law. A Scenic Resource framework diagram will be developed for each town using windshield surveys and photography. Local input will be extremely important in determining the relative values of scenic resources.

In Step 3, Growth Management Plans for each town will be developed by overlaying the three maps just mentioned and creating receiver zones and protection zones. Receiver zones will be areas targeted for growth which will have certain development stategies and regulations. The protection zones will be areas inappropriate for intense development and they will have strict regulations. The Growth Management Plans can be used by the towns to update their inadequate zoning ordinances or to create new ones.

In Step 4, County Development Guidelines will be created which will address intertown issues and site plan review guidelines. Site plan and design principles for different geographic conditions in the county will be illustrated along with generic implementation tools that will be useful to all the towns. This project will be completed by March 1991.

The GIS computer system, obtained through the AVCP, is an important facet of the Growth Management Plan project. The necessary work of combining and manipulating cartographic data could not be accomplished without it.

ASSISTANCE TO TOWN PLANNING BOARDS

The YCAVCP provides technical assistance to town planning boards on lake shore development issues such as erosion control, stormwater run-off, septic systems, and sub-divisions. Assistance is also provided for site plan review implementation to help control erosion.

This technical assistance is now being incorporated into the Growth Management Plan project. The GIS, with its analytical capabilities, plays an important role in technical assistance to the towns for the Growth Management Plan and for other planning projects.

CANANDAIGUA LAKE WATERSHED TASK FORCE

The YCAVCP is participating in the Canandaigua Lake Watershed Task Force which was formed to fulfill the Canandaigua Lake Watershed Protection Plan. The Plan was jointly developed by representatives of Cornell Cooperative Extension of Ontario County, Ontario County Soil and Water Conservation District, NYS Water Resources Institute, and the Community College of the Finger Lakes Environmental Conservation Department. The goal of the Task Force is to provide a comprehensive education program and to coordinate the activities of various groups which are concerned with protecting Canandaigua Lake.

Many municipalities, organizations, and individuals are participating in the project and many have contributed funds. The Canandaigua Lake Pure Waters Association has donated the services of their consultant on a part-time basis. After an initial meeting in October 1989, several committees were formed to address various issues. The committees include: land use and development; lake levels; water quality; recreation; rules, regulations and ordinances; research; and education. YCAVCP personnel are serving on various committees.

HIGHWAY SUPERINTENDENTS TRAINING

Yates County has nine townships with many miles of public roads. These roads are often on steep slopes and generally have unstable ditches. The ditches erode and constantly need expensive repair. The cycle of repair and erosion carries tons of sediment to the lakes. The USDA Soil Conservation Service estimated in the Erosion and Sediment Inventory (1974) an average erosion rate of 16 tons/road bank mile/year. Many ditches are unsafe for motorists because they are deep and steep-sided.

YCAVCP staff met with town highway superintendents to discuss YCAVCP's available road design resources. The superintendents were all interested in training and were especially interested in the following topics: surveying, hydrology study, culvert sizing, and road ditch design and stabilization.

Three half-day sessions were held to discuss these topics with the superintendents. An average of seven of the nine town highway superintendents attended every session. The Soil Conservation Service Area Engineer led the training. The training goal was to expose the highway superintendents to road ditch design factors and other factors they should consider during general road construction.

Highway superintendents now know there is technical help available for better road design and four towns have already asked for assistance since the training. Annual training sessions will continue on topics the superintendents suggest. If the superintendents implement what they learn in training, lake water quality will benefit.

A road ditch and culvert inventory will be completed in the future if funds are available. Town highway departments could use the data to prioritize road and ditch repairs and stabilization. The departments would then be more efficient at maintaining roads. This would lead to long term cost savings for taxpayers and improved water quality from reduced sediment.

ROAD DITCH STABILIZATION PROJECT

Many Yates County roads are built on steep slopes, 10% or greater. A USDA Soil Conservation Service report, Erosion and Sediment Control Inventory, estimates a road bank erosion rate of 18.8 tons/road bank mile/year in the Keuka Lake Watershed. Local governments have limited resources to properly stabilize their eroding road banks so they need technical advice to stabilize these banks as efficiently as possible.

Esperanza Road in the Town of Jerusalem was selected as a demonstration site for showing proper road bank stabilization. Esperanza Road has an average slope of 11% and eroded ditches three feet deep and eight to ten feet wide. Approximately 1700 feet of the ditch is highly eroded and needs to be stabilized. The ditch is currently a hazard to motorists and delivers large amounts of sediment to Keuka Lake.

In the Fall of 1989, the watershed was evaluated, the road and its ditch were surveyed, and a stabilization practice to reduce erosion was designed. Once reshaped and lined with medium sized stone (7"), the ditch will have adequate capacity to carry water without eroding. The YCAVCP is providing the rock and other materials and the Town of Jerusalem is providing the labor. The project will be completed in Spring 1990. (The ditch designs can be reviewed at the YCSWCD office in Penn Yan, NY.)

EDUCATIONAL ARTICLES

Several reports were submitted to the local newspaper explaining program activities and general water quality issues. (See Appendix F for copies.) The Keuka Lake Association's newsletter also contained reports on the YCAVCP.

In 1990, a mailing list will be developed and a quarterly newsletter will be published. The YCAVCP will also help the Keuka Lake Association with an aquatic vegetation workshop they are holding in June 1990.

EROSION AND SEDIMENT CONTROL WORKSHOP

YCSWCD with the Ontario Co. Soil and Water Conservation District sponsored and Erosion and Sediment Control Workshop on April 5, 1989 in Canandaigua, NY. Town road supervisors, town planning board members, zoning officers, and others were invited. Donald Lake Jr., P.E., a state conservation engineer with the USDA Soil Conservation Service (USDA-SCS), conducted the seminar. The session was very helpful because it gave easily understood guidelines to follow when controlling erosion at development sites. These guidelines could also be used during road construction and other activities.

Town planning boards and road departments represented at the seminar were given a copy of the USDA-SCS-NY "Guidelines for Urban Erosion and Sediment Control" at YCAVCP expense. The handbooks will be used often since the guidelines are so easily understood and helpful.

VINEYARD MULCHING PROGRAM

The YCAVCP began the Vineyard Mulching Program in 1988 when 66 acres were mulched. Eighty-one acres benefited from the program in 1989.

The Finger Lakes Region has ideal soils, climate, and topography for viticulture. But these same conditions, coupled with bare soil tillage practices, allow high erosion rates which increase sedimentation and nutrient loading of waterways. Vineyard erosion rates can range from 3.5 tons/acre/year on 2% slopes to 20 tons/acre/year on 11% slopes.

Mulching vineyard rows is an effective way to control soil loss and thus reduce the amounts of nutrients and sediments entering the surrounding waterbodies. When soil loss is reduced, a vineyard is more productive and requires less fertilizer. Nutrients provided by the organic mulch reduce the need for fertilizer even further. Because erosion is reduced and less fertilizer is used, water quality is preserved or improved.

A vineyard must show a calculated soil loss of at least three tons/acre/year to qualify for the Vineyard Mulching Program. The rows of qualifying vineyards are mulched with straw or hay. A minimum of 2,200 lbs. of staw or hay per acre is necessary to reduce soil loss but about 6000 lbs. per acre is normally applied, a rate adequate for alternate year application. YCSWCD personnel determine a vineyard's eligibility for the Program and then inspect the vineyard after mulch application. Vineyardists are compensated $75 per acre if every row is mulched and half that if every other row is mulched.

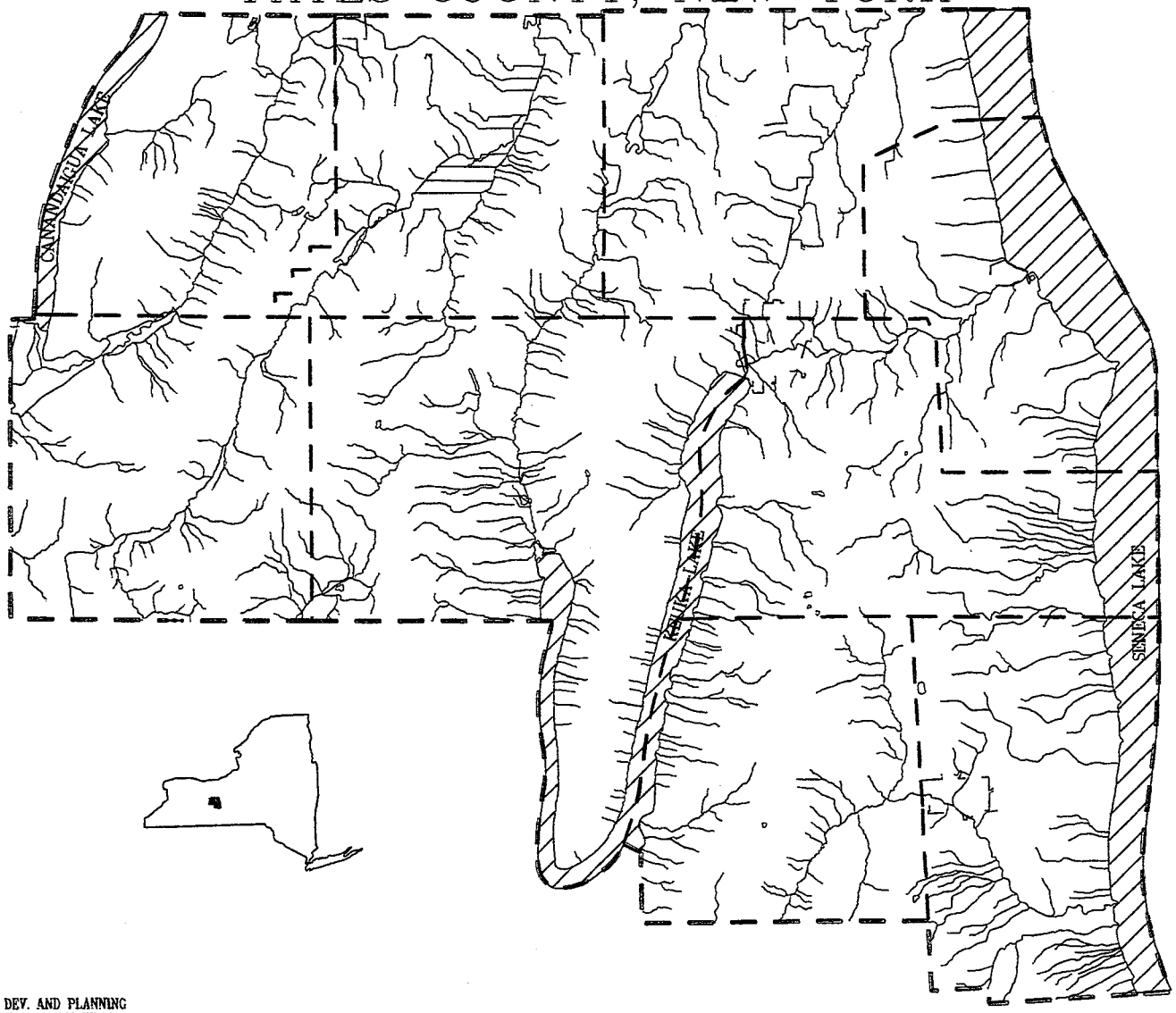
Soil loss from the 81 acres in this year's program averaged 6.1 tons/acre/year calculated soil loss before mulching. Calculated soil loss was reduced to 2.7 tons/acre/year after mulching. Research indicates that vineyard mulching can reduce soil erosion by up to 85%.

County vineyardists have shown great enthusiasm for the Vineyard Mulching Program during the two years it has been implemented. The vineyardists have seen the benefits of reduced soil loss during heavy storms, retained soil moisture under dry conditions, and improved soil structure. Local vineyardists have even designed and constructed mulch application equipment which is helping spread the practice to other vineyards in the area. The Vineyard Mulching Program will make mulching a permanent practice on many local vineyards and the program will be continued in 1990.

CONCLUSION

In spite of financial hinderances, the YCAVCP accomplished a great deal in 1989 as can be seen by the contents of this report. Significant progress has been made in protecting the Yates County portions of Keuka, Canandaigua, and Seneca Lakes from further water quality deterioration. There is no question that these lakes are a valuable resource to the people of Yates County and New York State. They deserve our attention as development pressures continue to threaten their quality.

YATES COUNTY, NEW YORK



YATES COUNTY ECONOMIC DEV. AND PLANNING
AMY R. DLUGOS, ENVIRONMENTAL ENGINEER
DATE: 01/11/90

APPENDIX A