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Lake Apopka: Operation Clean-Up

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For centuries man has tilled the soil in an age-old battle to eke out a living by growing food for himself and others. Problems have always been a part of the farmer's life — problems with nature, man and animals. But with the coming of technology, and the complex life-style that has evolved in the last half of the 20th Century, another foe has crept over the horizon.

It came in slowly at first, often unseen and unheard, but most of all, uninvited. Yet it is here: a foe called POLLUTION.

Agriculture in general has, in recent years, been blamed for many pollution problems. (According to Webster, to pollute means to render unclean or impure.) In the last two decades, much public concern has arisen over the apparent pollution of Lake Apopka. The Florida State Board of Health, Florida Game and Fresh Water Fish Commission and the news media apparently have agreed that Lake Apopka is dying a lingering death, and much unfavorable publicity has been given to the matter.

How is Lake Apopka connected with agriculture one may ask?

The lake is 48 square miles of fresh water in Central Florida, bordered by Orange and Lake counties. It heads a chain of lakes in the heart of a rich agricultural district.

Along the marshy northern shore of the lake, rich muck land (known by scientists as Everglades peat soil) has been drained and put into intensive vegetable farming operations.

During the three growing seasons, 1968-71, over $15 million worth of sweet corn, celery, carrots and other truck crops came out of the fertile soil around Lake Apopka and the surrounding area.

Some of the growers with farms around Lake Apopka belong to the Zellwood Drainage and Water Control District. The district is a municipal corporation organized under the provisions of a special act by the State Legislature in the early 1940's. It consists of 9,000 acres of farmland owned and farmed by a dozen or so growers.

Practically all of these growers are local residents and three-fourths of them have owned their land over ten years. In addition to the Zellwood district approximately 9,000 acres of muck land lies to the west near Lake Gem and Astatula. A. Duda and Sons, in the Lake Gem area of Lake County, have the largest farming area outside of the drainage district.

The growers who raise crops on this soil have been termed, in the vernacular, "muck farmers."

The muck land is drained for agricultural use and is separated from the lake by a system of levees. Since all the farmland lies about three feet below normal lake level, the excess drainage water, collected through a system of mole drains, field ditches and canals, must be pumped over the levy.

Over the years, the muck farmers frequently have been blamed for a variety of unfortunate things in the Lake Apopka area, from poor fishing to the high number of hyacinths. Henry Swanson, Orange County agricultural agent, says the growers even have been blamed for lack of rainfall in the area.

Numerous accusations, based on scant scientific evidence, have been made that the muck farmers are the cause of Lake Apopka's degradation. Fertilizer usage on the organic soil is cited as one of the main contributors to pollution in the lake.

Regrettably, man's activities combined with natural forces, have in a relatively short time produced a "highly euthrophic" condition in the lake according to scientific reports.

"Eutrophication" is a fairly new word in use because of increased concern with the environment. In layman's terms, it means organic materials are getting into the water and decaying. As they decay, oxygen is taken from the lake, causing it to slowly die.

Even to the casual observer, the lake appears "dirty" or "polluted." A heavy aglae bloom occurs and loose deposits on the lake bottom become stirred up during windy weather giving muddy water and poor reproduction of game-fish and fish foods.

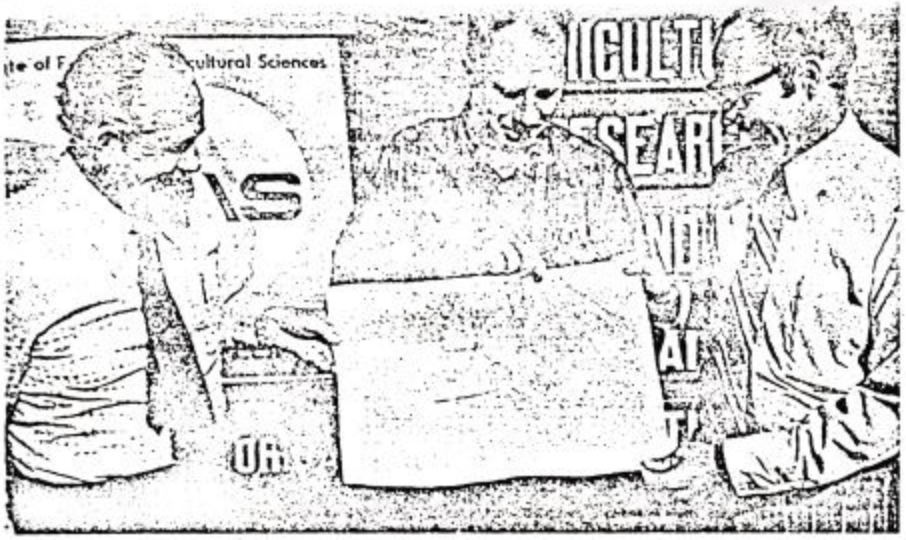
Catfish and rough fish are about the only natural residents left in the lake, which at one time was known as a fisherman's paradise.

Over the years, three large scale chemical treatments have killed an estimated 20 million pounds of trash fish which have decayed in the lake.

Further pollution has occurred from decay of plant materials resulting from hyacinth control sprays and aquatic plants uprooted by a passing hurricane in the 1950's. The natural make-up of the lake has been upset giving a vast increase in aglae stimulated by incalculable tons of plant nutrients added to the water by decay of the dead fish and plant materials.

Among the conclusions published in a state Board of Health report, the main reasons for pollution in the lake are excessive nutrients (phosphate and nitrates) and semi-suspended bottom debris. The major sources, from which these nutrients originated, have been reported as follows:

- *Decayed fish resulting from the chemical treatment.*
- *Decayed hyacinths and other aquatic plants.*



SOME $50,000 in funds are being provided by growers in the Central Florida Agricultural Institute for a pollution clean-up project at Lake Apopka. Some key men in the research effort are (L to R): Drs. John F. Darby, director of the Agricultural Research and Education Center, Sanford; Richard B. Forbes, associate professor and Larry R. Sinclair, assistant professor at AREC, Sanford.

- *Waste from citrus processing plants which border the southern and eastern lake shore.*
- *Effluent from sewage disposal systems (Winter Garden and some other towns adjoin the lake.*
- *Drainage water from the muck farms.*

As a result of the state's study, the Zellwood growers and Henry F. Swanson, Orange County agricultural agent, requested scientists at the Agricultural Research and Education Center, Sanford (then the Central Florida Experiment Station) to obtain more information about the alleged "pollution" of the lake by growers in the area. Dr. Richard B. Forbes, associate soils chemist at the experiment station, has been one of the main researchers working on the continuous water-quality study since 1967.

Water samples were taken by Dr. Forbes at frequent intervals from farm canals in the Zellwood area and from adjacent Lake Apopka over a two-year period. The samples are analyzed for total solids, soluble salts, plant nutrients, DDT and parathion. The results of Dr. Forbes' research reveal that no parathion has been found in any of the samples. No DDT has been found in the lake water, and other than the salts or nutrients there is generally little debris or solid matter being pumped into the lake. Overall, there have been no harmful effects from the pesticides used by the growers and the natural lake life, reportedly, has been unaffected.

This is contrary to some sensational press reports of "swill" being pumped into the lake by farmers. In fact, the water in the farm canals generally is much clearer than the lake.

Dr. Forbes states in one report, however, "That even though pesticide contributions were very small, the nutrient content of the canal water being pumped into the lake cannot be overlooked." For example, with seven pumps operating in the Zellwood district, each with a 50,000 gallon-per-minute (gpm) capacity, the pumps would be capable of delivering to the lake 178 million pounds of water each hour.

Even if the water contained only one part per million (one ppm) of a given nutrient, 178 pounds of the nutrient would be added to the lake each hour. This would add one ton of foreign matter per 12-hour day to the 31,000 acre lake.

Water quality studies of the Zellwood district continue and the most recent results published are generally in agreement with earlier findings. Farm canals are usually higher in nutrients and total solids than the lake water, and essentially no pesticides have been found in the 3½ years since research began.

Actually, the organic Everglades mucky peat soils of the Zellwood district are something of an unusual conservation problem. Something like the case of having your cake and eating it, too.

The decision to drain the muck land and farm the fertile peat was made 30 years ago without anticipating future ecological consequences. In fact, at that time, no one then was in a position to predict the consequences.

A scientific term for the muck soils is "hydromorphic," meaning water formed or soils developed under water. There are some problems which come from drainage of the soil, primarily "oxidation" when soils very rich in organic matter are exposed to the air, oxygen in the air is decomposed and the soil is lost. The grower may leave a heavy cover crop or flood the field if it is not in use.

As a conservation practice, some muck farmers flood their land in the summer when it is idle. This helps prolong the life of the muck soil and prevents oxidation. It is also a means of pest and disease control.

Good land use management will determine the future productivity of farms in the Zellwood district and other muck lands. As a step in developing good land and water management through the most economical means, a group of 33 growers, in the Oklawaha River area, have formed the Central Florida Agricultural Institute (CFAI), a non-profit corporation for the purpose of helping clean up the polluted water going back into Lake Apopka and prolonging the life of the lake.

The CFAI has hired an engineering firm, Fiske-Gay & Associates, Inc., Orlando and an attorney to represent them, in addition to providing $50,000 to the University of Florida's Agricultural Research and Education Center, Sanford, for scientists to work directly with growers in monitoring the quality of agricultural waste water and preventing further pollution of the lake.

Drs. Larry Sinclair, John F. Darby and Forbes are some of the key people involved in the research effort.

Jim Fiske, the Orange County engineer working with the group, expresses the opinion that CFAI is one of the most progressive agricultural groups he has encountered. "They are taking the bull by the horns," he says. "where in the past water has been pumped back into the lake the farmers now plan to recycle the water by pumping it into holding reservoirs and using it as needed. They are spending a lot of their own money in doing this, which is a commendable action in itself."

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The experimental recyclying and monitoring plan proposed by Fiske-Gay was approved recently by the Florida Department of Pollution Control (DPC). A construction permit has been issued and some recycle reservoirs are already being built.

William D. "Billy" Long, a muck farmer who is on the Orange County Pollution Board, is a member of the CFAI. He says the water problem is very complex and it is hard to say who is responsible for what regarding the pollution of Lake Apopka.

Each member in CFAI pays for the services according to the size of his operation. This way everyone in the organization gets the benefit of the engineer's plans and the attorneys' consultation.

All members are covered under the newly issued construction permit. If a complaint is filed against a member, Leon Miller, president of the CFAI, follows up on it and works matters out with the engineers.

Long explained that if it were not for the institute, each individual grower who has a pump on his property would have to get a pumping permit and hire an engineer. The 33 growers have put up approximately a half million dollars to comply with the recycle plans in the Fiske-Gay report and are giving top priority to the clean-up operation.

The Zellwood growers have plans for constructing a two-mile recycle dike along the lakefront of the Zellwood district which would contain all the water from pumping station No. 2. The DPC has requested growers to shut down this pump which has a pumping capacity of 50,000 gpm and has drawn major criticisms. All other small pumps in the area would also be abandoned except in time of storm or hurricane.

The dike construction will allow water accumulation to be two feet higher than normal lake level and takes in 440 acres of lake. Total cost of the proposed dike is an estimated minimum of $112,000. During dry periods Zellwood growers in unit two can use the water kept in the recycling area. During wet periods, water from the farms can be pumped into the area. The dike will have emergency overflow structures in case of storm or hurricanes.

Stanley Winn, environmental planner with the Department of Pollution Planning Division, says the dike proposal by CFAI may run into some opposition from certain state departments since Lake Apopka is state property. Winn was quick to add, however, that the DPC feels farmers in the Oklawaha River area are making progress in handling their pollution problems. "Naturally, there are still some problems to be worked out," he said, "but the growers have made a tremendous amount of progress in this area."

Billy Long figures that the main opposition to the dike probably will come from fishermen in the area. "But, the dike will use only a little over one per cent of the total lake, so it should have little affect on fishing.

Some may ask, why not use farm land for the recycle reservoir instead of the lake?

Two main reasons given are: none of the growers want to sell their land, valued at $1,200 per acre, and if enough farmland could be bought for the reservoir it would cost approximately $528,000. It would cost another $138,600 to build the recycling reservoir, for a total cost of over a half million dollars. "We simply couldn't afford it," explained Long.

What exactly is it costing the muck farmers to meet the pollution problems they are facing?

Frank Hooper, Hooper Brothers, Inc., has spent approximately $75,000 for a recycle reservoir. He has converted 40 of his total 400 acres of cropland for use as a reservoir. The land is valued at $1,200 an acre and another $27,000 has been spent on construction cost for the water holding area, including dredging, filling, etc.

A. Duda and Sons has put $100,000 into a recycling plan. Other growers have spent equivalent amounts or more on similar plans.

What's the probable outcome of the project?

That's the answer the farmers themselves are awaiting. Dr. John Darby, head of the Agricultural Research Center, Sanford, says researchers there have about a year to work with the farmers. "If the growers are still contributing to the pollution of the Oklawaha River Basin, they will have to figure out some way to reduce the nutrients in the water," says Darby.

Dr. Forbes explained further, "Here at the Research Center we are trying to find ways to prevent further nutrient over-enrichment and total solids of the lake water. Total solids is the total amount of solids in a given amount of water. You dry the water out and measure what's left to find out the amount of total solids.

If Lake Apopka is dying, why the big push to save it?

Again, Forbes answered, "This is the head lake for a whole system of waterways. Things found out now could be applied in other places and used in the future. One thing we do know is that the farther you get from Lake Apopka the better the water quality becomes, so we're going to do what we can to improve the water quality here.

Larry Sinclair, assistant agricultural engineer at the station, who will be working with growers on the project, says, "It took ten years to put a man on the moon and a good deal more money than we have here, but given the time to work on these problems, while we may not be able to solve all of them — one thing is certain — quite a bit of progress over what's been done in the past will come about."

Dr. Forbes added, "There's really a twofold problem here: farmers need to make a living and provide food for others; fishermen and recreation seekers need and desire the use of outdoor waterways."

In the end it may come to the matter of priority, or, as grower Long puts it, "What's more important? Fishing — or eating!"

In light of the work being done by the CFAI and other farmers, it is well to remember the words of Dr. E.T. York, vice president of the University of Florida, "Let us remember that water is absolutely essential to all plants and animal life . . . without an abundant supply for everyone, life as we know it today may not exist in the world of tomorrow. For we are all dependent upon each other and we must understand each other's needs and viewpoints."

It does appear that the muck farmers have an understanding of society's needs and they are working toward meeting those needs.

A note of thanks and appreciation goes to the men at the Sanford Agricultural Research and Education Center, Billy Long and others, who contributed source material for this article.