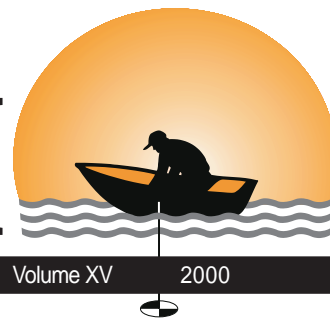


Florida LAKEWATCH



A Publication Dedicated to Sharing Information About Water Management and the Florida LAKEWATCH Program Volume XV 2000

Where Does Lake Water Come From?



These before and after shots of Lake Brooklyn in Clay County illustrate just how much lake levels can fluctuate in Florida.

*Inspired by and excerpted from **Hydrology of Central Florida Lakes – A Primer**, U.S. Geological Survey Circular 1137*

Is my lake spring-fed?

Why is my lake drying up?

Why is my lake level so high when other lakes in the area are low?

These are questions commonly asked of LAKEWATCH staff, and while the answers are not always readily available there are resources available that can help explain how and why water levels fluctuate so drastically in Florida lakes. One of the more prolific sources is the U.S. Geological Survey (USGS), a governmental agency that has

been studying and collecting hydrologic data on Central Florida lakes since the 1920s. As of 1994, the USGS has published 66 reports and maps on central Florida lakes.

A 1998 USGS publication, *Hydrology of Central Florida Lakes—A Primer* (Circular 1137), provides insight into how Florida lakes “work” and how they can be described based on their drainage characteristics:

Lakes in Florida and elsewhere commonly are classified by drainage characteristics; it is these characteristics that differentiate Florida lakes from lakes in other parts of the country. This general classification divides lakes into one of two major types — seepage and drainage lakes. Although there are many other hydrologic characteristics associated with each type, perhaps the most easily recognized property used to distinguish between seepage and drainage lakes is the absence or presence (respectively) of surface-water outflow.

Lakes that have no surface-water outflow lose water primarily through the ground-water system or through evapotranspiration and are called seepage lakes. Lakes that lose water primarily through a surface-water outlet are called drainage lakes (Wetzel, 1975).

Most Florida lakes are seepage lakes—

nearly 70 percent of the lakes in Florida have no surface-water streams flowing into or out of them (Palmer, 1984)...

Drainage lakes, with some type of surface-water outlet are often referred to as **open-drainage basins**. **Seepage lakes** and their surrounding drainage basin are often referred to as **closed basins**—due to the lack of surface-water outflow from the basin. However, even if there is no apparent visual outlet of water from many Florida lakes, water can still be draining from the lake through ground-water seepage.

This is where Florida lakes are set apart from lakes in other parts of the country; the classical definition of a drainage basin doesn’t always apply to Florida lakes:

A drainage basin or watershed (the area contributing water) of a lake commonly refers to the land surface area drain-
Continued on pages 4 & 5.

Attention

Don’t miss out! Enroll your Homeowner Association with LAKEWATCH today. Please provide us with the name of your association, the president’s name, mailing address and phone number.
Call 1-800-LAKEWATCH



UNIVERSITY OF
FLORIDA

Institute of Food and Agricultural Sciences
Department of Fisheries and Aquatic Sciences

Update on Tsala Apopka TEAM Approach Project

If you'll recall from our front page article in the last newsletter, the TEAM* Approach is a three-step process for developing comprehensive and integrative lake management plans and water resource policy for lakes or other waterbodies.

It's a process that involves stakeholders such as lay citizens, scientists, agency personnel, local business persons, etc.—anyone with a vested interest or commitment to managing their local waters. Using the TEAM approach, people work together to identify, define, and prioritize concerns and potential courses of action concerning water resource issues.

In this instance, the TEAM approach was recently adopted by a group of citizens, water managers, and scientists regarding the Tsala Apopka Chain-of-Lakes in Citrus County. It's a cooperative project involving the Withlacoochee River Basin Board of the Southwest Florida Water Management District and Citrus County Board of County Commissioners.

The project began on May 9, 1998 and culminated December 1999 with the publication of the Tsala Apopka Chain-of-Lakes Management Plan. The plan includes recommendations in the following five major sections. These recommendations are based on issues of concern from citizens who use or live on the Tsala Apopka Chain-of-Lakes, and from discussions using the best available science for each issue.

Some of these recommendations may serve as a template for managing your own lake—but only after first examining the issues of concern:

Section I — Who is in charge?

established a five-member advisory board responsible for steering the management plan and continuing a modified TEAM approach on an annual basis to receive citizen and professional input on emerging issues.

Section II — Water Quality

includes plans to maintain and expand water chemistry monitoring where needed; initiate a comprehensive total and fecal coliform bacterial monitoring program; initiate a sampling program to examine contaminants in sportfish to evaluate potential health concerns.



Serving as moderator for one of the TEAM citizen panels, Dr. Chuck Cichra (left) takes notes while panel members discuss issues and possible solutions for their Tsala Apopka lake management plan. Highlights of their discussions were later presented to the larger TEAM group.

Section III — Aquatic Plants

includes plans to initiate a lake-use survey; maintain current levels of aquatic plant management; remove muck and sediment as well as shoreline muck from select locations.

Section IV — Fish and Wildlife

includes initiation of a fisheries creel survey on each of the main pools of the Tsala Apopka Chain-of-Lakes; initiation of a fish sampling program and bird survey to examine populations using the Tsala Apopka Chain-of-Lakes.

Section V — Water Levels

suggests maintaining current water control structures while evaluating the current regulation schedule; initiating the investigation and modification of specific roads/berms/dikes and drainage channels; restoring the Wysong Dam on the Withlacoochee River and monitoring its effects on water levels in the Lake Tsala Apopka and water flows within the river.

These recommendations are the result of 11 months of discussions among all interested parties. First, the problems and/or concerns were defined by the citizens that use or live on the Tsala Apopka Chain-of-Lakes. Then pros and cons of each issue were discussed using the best available data, yielding options that were presented back to the citizens.

Citizens then selected recommendations for the management of the Tsala Apopka Chain-of-Lakes based on all of the available information. The plan follows very closely the recommenda-

tions of the citizens and has been provided to appropriate policy makers, agencies charged with the management of the Tsala Apopka Chain-of-Lakes and the overall public for due consideration.

It is our hope that many of the recommendations put forward in the management plan will be initiated soon. We also hope that as time passes by, and circumstances change, the plan will be modified as needed. It's important to remember that documents such as this need to be "living" documents—open to change, just like the United States constitution. Time will also allow us to evaluate the whole TEAM process and whether it helped with the management of the Tsala Apopka Chain-of-Lakes.

I'll be presenting a report on this process at the Florida Lake Management Society's Annual meeting this May (see Calendar on page 8 for details about the meeting).

— Mark Hoyer

* TEAM is an acronym for "Together for Environmental Assessment and Management."

Florida LAKEWATCH

newsletter is generated by the Florida LAKEWATCH program, within the Department of Fisheries and Aquatic Sciences of the Institute of Food and Agricultural Sciences (IFAS) at the University of Florida (UF). Support for the LAKEWATCH program is provided by the Florida Legislature, grants and donations.

For more information about LAKEWATCH, to inquire about volunteer training sessions, or to submit materials for inclusion in this publication, write to:

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(352) 392-9617 ext. 228
E-mail: lakewat@ufl.edu

All unsolicited articles, photographs, artwork or other written material must include contributor's name, address and phone number. All submissions shall remain the property of Florida LAKEWATCH and cannot be returned. Opinions expressed are solely those of the individual contributor and do not necessarily reflect the opinion or policy of the Florida LAKEWATCH program.

Inclusion does not constitute endorsement, nor does exclusion represent censure of any item, organization, individual, or institution by the University of Florida or the Florida LAKEWATCH program.



LAKEWATCH Volunteers Invited to Participate in Ground Truthing Project



LAKEWATCH volunteers are not alone in their concern about changes in their lake's watershed. The Florida Department of Environmental Protection's (DEP) Watershed Management Bureau is also keeping a watchful eye and, for a couple of dozen LAKEWATCH lakes, providing volunteers with an opportunity to increase what is known about their lake's surrounding acreage.

As part of a pilot project, a small group of LAKEWATCHers will be invited to collect and verify data on two issues of particular interest:

- (1) Determining the precision of land use data, known as ground truthing, and
- (2) the location of lake inflows and outflows.

Ground Truthing

In an effort to keep track of how Florida's "terra firma" is being used and developed, the Bureau collaborates with Florida's five water management districts and private contractors, to collect and interpret information on ground conditions in specific geographic areas.

This type of information is known as **land use data** and is collected every five years for the entire state of Florida. Data are collected in the form of aerial photographs known as "base maps." Ground conditions and/or land uses are documented on the maps with a color-coding system that is interpreted by computers and then double-checked (or "ground truthed") by a cadre of experts.

Ground truthing is a technique researchers use to make sure their data are accurate. However, as you can imagine, it can be a tedious and time-consuming proposition. That's precisely why the DEP Watershed Management Bureau is teaming up with LAKEWATCH and involving dedicated volunteers that are already out on their lakes collecting water chemistry data.

Kim Schildt, DEP's land use project coordinator explains: "We want to see how much change the volunteers can detect from the 1995 land use data to present conditions."

This information will help the Bureau determine (1) if the land use was interpreted correctly by the computer and (2) any changes that might have occurred.

To accomplish this goal, DEP's Geographical Information Systems (GIS) staff will be asking LAKEWATCH volunteers to record observations about how the land is currently being used in 100-meter wide bands around twenty-four pilot study lakes. Field

5), inflows and outflow sources such as canals, pipes, spillways, etc., can affect a lake's ecology and yet little of this type of information is available for many lakes.

Citizen monitors will play an extremely valuable role in gathering this information, which will be added to hydrologic modeling initiatives and stored for future reference. [Note: Volunteers that aren't participating in the pilot project but want to find inflows and/

or outflows for their own information should be aware that many Florida lakes are seepage lakes and don't have inflows or outflows. For more on this see "Where Does Lake Water Come From?" on pages 1, 4 & 5.]

If this pilot project initiative is deemed productive for LAKEWATCH and the DEP, the number of lakes will be increased. Lakes in the pilot study include Alto, Ann, Broken Arrow, Bugg Springs, Charles, Como, Crystal, Deerback, Eaton, Georgia, Grasshopper, Halfmoon, Higgenbotham, Little Crystal, Little Orange, Little Santa Fe,

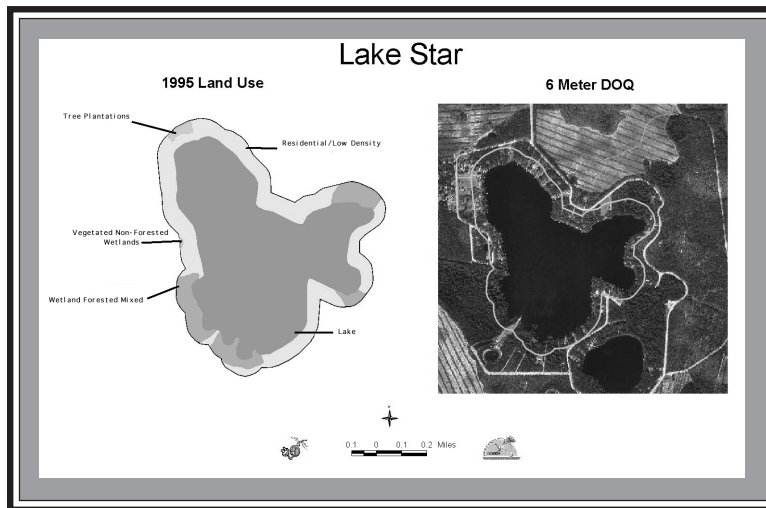
Lou, Melrose Bay, Riley, Santa Fe, Sellers, Star, Winnemissett, and Winnott.

LAKEWATCH volunteers that live on these lakes will be given an opportunity to participate and will be hearing from LAKEWATCH staff soon.

Kim Schildt is enthusiastic about the project. "We look forward to working with citizen monitors and are truly excited about having access to their years of experience on Florida's lakes."

LAKEWATCH program leader Mark Hoyer is looking forward to the project as well. "Having access to this technology can help LAKEWATCH volunteers. The updated land use data will be added to our LAKEWATCH data base and could provide important clues as to what is potentially impacting the water chemistry of a lake." **FLW**

** Temporal – of or relating to the sequence of time or to a particular time.*



An initial group of FLW volunteers will be given maps like this and asked to make notes of any land use changes in the 100-meter wide upland zone from the lake.

maps are being created for the volunteers to take out in their boats. The maps will list the computer's interpretation of land use for that particular 100-meter upland zone. Volunteers will be asked to make visual inspection of the zone and then make notes on any land use type that doesn't agree with the map.

The volunteer's notes will be recorded in Tallahassee and staff will develop an index of change for each lake region. In return for the volunteer's help and eyewitness accounts, DEP will provide statistics on land use to the LAKEWATCH program every five years for temporal* comparative study.

Inflows and Outflows

Land use isn't the only type of information being gathered in this project. Monitors will also be encouraged to sketch-in hydrologic (water) inflows and outflows on aerial photographs, to add to the "bank" of baseline information for these lakes. As discussed in the article on page 1 (continued on pages 4 &

Where Does Lake Water Come From?

Continued from page 1.

ing to a water body as defined by topography. However, because most of the **inflow** to seepage lakes in Florida is from ground water, the ground-water basin must be considered part of the contributing drainage basin. Ultimately, however, the most significant difference between seepage and drainage lakes is not the **source** of the water, but the controlling factors affecting lake water volume (ground-water or surface-water **outflows**)...

Lakes lose water to evaporation, seepage through the bottom, and streamflow (in lakes with surface-water connections). Rainfall and streamflow are relatively easy to measure, but recharge, evaporation, and seepage are much more difficult to determine accurately.

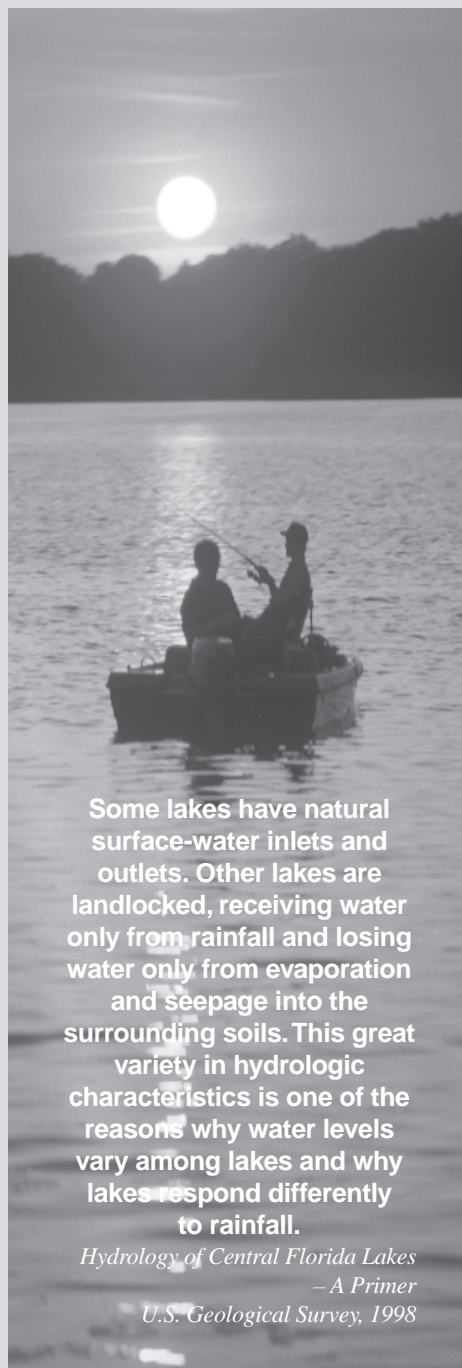
The same holds true for pinpointing the source of water in many Florida lakes. While most people may think their lake is spring fed, the reality is that the majority of lakes in Florida are seepage lakes, with ground water seeping through the soils of the lake bed (known as lateral seepage). According to the experts, the only way to tell if your lake is spring fed is to have visual evidence of water bubbling out of a spring from the lake bottom. Other sources for lake water include rainfall on the surface of the lake, surface runoff within the drainage basin, or some other external source such as a river or stream.

Rainfall and Lake Levels

Perhaps the most important thing to remember about lake levels in Florida is that they are largely dependent upon rainfall. When the weather is dry, many lake levels are low. When it rains, lake levels generally rise.

This may seem fairly simplistic, but it's something that many of us have to be reminded of—especially when planning to build a house or a dock. In fact such information could be crucial to the success of the project (see photo of Open Lake on pg. 5).

LAKEWATCH volunteer Maurice Logan of Lake Wales knows about such things. He's been keeping track of both rain-



Some lakes have natural surface-water inlets and outlets. Other lakes are landlocked, receiving water only from rainfall and losing water only from evaporation and seepage into the surrounding soils. This great variety in hydrologic characteristics is one of the reasons why water levels vary among lakes and why lakes respond differently to rainfall.

*Hydrology of Central Florida Lakes
— A Primer
U.S. Geological Survey, 1998*

fall and lake levels for Blue Lake in Polk County for 31 years. He's personally documented that Lake Blue's levels have varied by as much as 11.5 feet over the years. And sure enough, there appears to be a strong correlation to rainfall (see Figure 1 on page 5). Maurice deserves to enjoy a good chuckle

when he reminisces about the times he's tried to advise neighbors about where to build their dock, and then watched them scratch their head when lake water either submersed the dock or dropped away by dozens of feet.

And what about lakes that remain low even after a good rainfall?

Donna Schiffer explains why in the USGS hydrology primer. "Just as daily rainfall varies from one day to the next, total annual rainfall varies from one year to the next. The difference from annual rainfall and the long-term average rainfall is called the 'departure' from average for that year. These annual departures from the average can have a cumulative effect on lake water levels. For example, a series of years with less than average rainfall may result in lake water levels that are lower than the long-term average level for that lake." (Hydrology of Central Florida Lakes – A Primer, USGS, 1998).

This would help to explain why many Florida lakes are still low, even after encountering several heavy rains. It's also important to remember that Florida has been experiencing drought-like conditions for more than ten years now. Because most of Florida's lakes are seepage lakes, and heavily influenced by ground water, they can still remain low, even after a good gully washer.

Geology can also have a lot to do with a lake's ability to "keep" water. Lakes with sandy or porous rocky ground underneath are more susceptible to losing water via seepage than lakes located in areas with more clay in the soils. Clay soils can act as a barrier, preventing water from seeping out as quickly as the more sandy soils.

One more less obvious way that lakes lose water is through evaporation. Because it's a more or less invisible process, it's something many of us forget about. However, in central Florida, evaporation rates have been estimated to be as low as 25 inches per year and as high as 50 inches per year (Tibbals, 1990).

Photo courtesy of Central Florida Visitors and Convention Bureau

Setting Minimum Lake Levels

As Mr. Logan's hydrograph illustrates (see Figure 1), lake levels can fluctuate considerably, even dramatically. The fluctuations can be natural as a result of rainfall, or they can be affected by human activities such as withdrawal of water for consumptive use, flood control manipulations, dredge and fill projects, etc.

So how does one know whether a lake's water level is too low, too high or a desirable range?

Florida's water management districts are currently in the process of trying to answer these questions. Thanks to a legislative mandate (Section 373.042 Florida Statutes), the water management districts are now required to establish minimum levels for lakes. Granted, there's not much they can do about rainfall, but once minimum lake levels have been established, they can be used to make management decisions about human activities and to achieve wildlife management goals.

For more information about lake levels for your lake, call the contact person for your district:

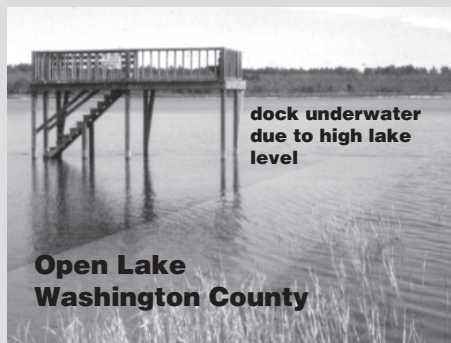
Northwest Florida WMD 850/539-5999
Contact: Nick Wooten

Suwannee WMD 904/362-1001
Contact: Tom Murtee

St. Johns River WMD 904/329-4497
Contact: Garrett Wallace

South Florida WMD 561/686-8800
Contact: Angela Chong ext 6514

Southwest Florida WMD 800/423-1476
Contact: Richard Gant ext 4222



Mark Brenner

Knowing a lake's historical water levels can help when planning the location of a dock, boathouse, or lakefront home. Of course even the best laid plans can be flooded (see above).

Terms to Know

Aquifer – a layer or combination of several layers of permeable soils or rocks that yield usable quantities of water. Florida has three major types of aquifers: the Floridan, the Middle and the Biscayne. Aquifers in Florida are primarily made up of limestone. The limestone rock acts as a sponge to hold water. The holes in the rock allow water to flow freely through it.

Evaporation – the process by which water is changed from the liquid state into the gaseous state through the transfer of heat energy.

Evapotranspiration – the sum of water lost from a given land area during any specified time by transpiration from vegetation and building of plant tissue; by evaporation from water surfaces, moist soil, and snow; and by interception (rainfall that never reaches the ground but evaporates from surfaces of plants and trees).

Ground water – water that is present below the water table.

Surface water – water that is present on the land surface, generally referring to lakes and streams.

Water table – refers to a surface below which all the openings or spaces in the soil or rock are filled with (or saturated with) water. The depth to the water table can range from 50 feet below the land's surface. It even includes "above land" surfaces (i.e. wetlands and lakes).

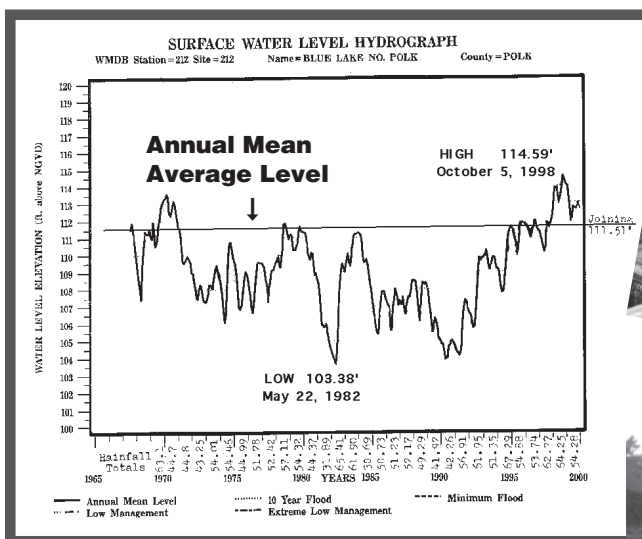


Figure 1 Maurice Logan sent us this hydrograph of Blue Lake in Polk County. He's been recording rainfall and lake levels since 1967 and has documented proof that the lake fluctuates by as much as 11.5 feet. Notice how the lake's record low point corresponds directly with an extremely low annual rainfall of 31.89 inches. The high point corresponds with a high annual rainfall of 64.25 inches.

Photo at right depicts lake level gauges on Pebble Lake in Clay County. This lake has a fluctuation range of 10 meters (about 30 feet) !



Maurice Logan and grand-daughter Natalie



Mark Brenner

Countless Ways to Use LAKEWATCH Data

Florida LAKEWATCH Data Used To Improve Fishing

This past autumn, Fish Orlando!, an urban fishing program, announced five water bodies (dubbed the FAB 5) that will complement an existing urban ponds project. The program was developed to “promote freshwater fishing and provide convenient, quality fishing in the greater Orlando area,” and is coordinated through the Florida Fish and Wildlife Conservation Commission (FWC)—formerly known as the Game and Fresh Water Fish Commission (GFC).

Lakes Clear and Starke, two of the FAB 5 lakes, are monitored by LAKEWATCH and represent yet one more way in which water chemistry data can be used. (The other lakes that were chosen are Kirkman Pond, Cane-Marsha Park, and Turkey.) According to Jim Sweatman, coordinator of the Fish Orlando! program, data collected by LAKEWATCH volunteers has been useful in both the selection process and in developing management strategies for the FAB 5. “LAKEWATCH data provide a pulse beat on water quality—an important component of fish habitat assessment. Having the water quality data available frees us up to focus on fish management decisions.”

Management goals, activities, and regulations have been developed for each waterbody; and plans are being made for construction of fishing piers, installation of fish feeders and aeration systems, habitat enhancement projects, improved fishing access, stocking fish, and organizing promotional activities.

LAKEWATCH data should also prove helpful with other Fish Orlando! projects to protect the Butler and Conway Chain-of-Lakes. Aside from being two of the largest lake chains in Orange County, these lakes are famous for their quality largemouth bass fishing opportunities. LAKEWATCH water chemistry data and aquatic plant data for many of these lakes can be used in combination with other data to investigate historical changes in water chemistry, aquatic vegetation, and angler impacts on the Butler and Conway Chain-of-Lakes.

—Melanie Caudill



Photo courtesy of Central Florida Visitors and Convention Bureau

Editor's Note:

Aside from the usual perks of being a volunteer (e.g. water monitoring training, access to lake experts, use of sampling materials, free newsletters, data reports on your lake, etc.), this is a perfect example of how monitoring your lake can open doors to other opportunities. If your lake has experienced special treatment or opportunities as a result of your participation in LAKEWATCH, we'd love to hear from you. Give us a call, an e-mail, or drop us a note.

Lake Disston Uses FLW Data For “Outstanding Florida Waters” Status

After eight years of monitoring the waters of Lake Disston, including five long years of meetings, petitioning, talking to agencies, citizens, reporters, legislators, etc., FLW volunteers Ann and Tom Moore recently

contacted us with the news that Lake Disston, in Flagler County, has been designated an Outstanding Florida Waterbody.

What is an Outstanding Florida Waterbody (OFW) ?

According to the OFW governing agency, the Florida Department of Environmental Protection (DEP), the intent is to prevent deterioration of existing water quality of waters that are “worthy of special protection because of their natural attributes.” Once a waterbody has been designated as an OFW, any future activities on the lake (wastewater discharges, dredge and/or fill, etc.) are subject to higher permitting standards. In addition, “permits cannot be issued for new direct discharges of pollutants into an OFW that would result in lowering of existing water quality.”

FLW water chemistry data played an important part in this process by serving as invaluable baseline information for future water chemistry to be compared with. Without it, lake residents are basically stuck with trying to use anecdotal memories as a measuring stick for determining change—as opposed to hard numbers. For more information contact:

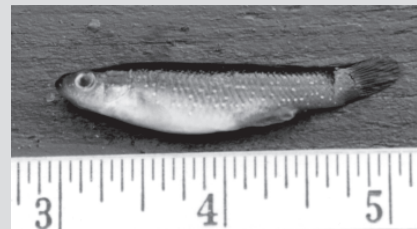
Ann and Tom Moore (904) 767-2372
E-mail: ayinm@msn.com

Department of Environmental Protection
Eric Shaw (850) 921-9929
Janet Klemm (850) 921-9928

Featured Fish: Golden topminnow ~ *Fundulus chrysotus*

Darting in and out amidst beds of aquatic vegetation, the petite golden topminnow is one of Florida's native fish that most folks never see. Averaging about two inches in length, light green to gold colored (even orange at times), with tiny golden flecks, these fish make an excellent aquarium fish as it is one of the few wild fresh water species that maintains its true coloration in captivity. They are also fairly common to Florida lakes and easy to identify and collect. (Try using a dipnet around areas of heavy vegetation in more nutrient rich lakes.)

Males can be identified by six to 10 dark vertical bars along their sides. They inhabit a range from South Carolina to Florida; west along the Gulf of Mexico to eastern Texas; and north to extreme southeastern Missouri.



VOLUNTEER BULLETIN BOARD

Bragging Rights

While it may not be cover of the TIME magazine, we're mighty proud of the fact that Florida LAKEWATCH's very own volunteer Dr. Bill Crass made the cover of the 5th edition of the National Directory of Volunteer Environmental Monitoring Programs. Published by the U.S. Environmental Protection Agency, the Directory chronicles the continuing growth of volunteer monitoring and provides highlights of programs from around the country. For a copy of the directory, contact EPA's National Center for Environmental Publications and Information (NCEPI) at 1-800-490-9198. Ask for publication number EPA 841-B-98-009. The directory is also available on-line and updated regularly: <http://www.epa.gov/owow/monitoring/vol.html>



Zebra Mussel Warning

Advisories are now being posted at Florida rest stops and tourist bureaus in an effort to stop the spread of yet another exotic aquatic organism. This time, it's a thumbnail-size zebra striped mollusk (*Dreissena polymorpha*, or zebra mussel) which could cost Florida taxpayers millions of dollars if they should become invasive in Florida waters.



While zebra mussels were named for their stripes, they don't always have them and can appear with a solid brown coloration.

The zebra mussel was first identified in North America in 1988 in the ballast water of foreign cargo ships. Since then they've spread throughout the Great Lakes and worked their way down the Mississippi River to New Orleans. In the Great Lakes region alone, more than \$5 billion has been spent to repair and prevent damage done.

stand the greatest chance of inadvertently picking up these pesky hitchhikers. "The almost microscopic larval stage of zebra mussels are easily transportable in the bilge water and live-well water of boats brought to Florida from other states. In addition, a mussel species with an appearance similar to that of the zebra mussel, the false dark mussel (*Mytilopsis leucophaeta*), has recently been found in inland waters of Florida."

Warren suggests carefully cleaning/flushing your boat, boat trailer, bilge and live wells with a chlorox solution to prevent their spreading into Florida lakes and waterways. Flushing the engine cooling system with hot water is also suggested. Boats and trailers should be allowed to dry for three to four days before being used again. Other gear such as fishing poles and snorkeling equipment should be checked.

For a free publication about zebra mussels, contact the Escambia County Extension office at (850) 475-5230. If you suspect that you have seen zebra mussels or false dark mussels in Florida fresh waters, please contact: **Gary Warren** (352) 392-9617 ext 279

Frog Listening Network

Frog enthusiasts will be glad to know that there is now a volunteer program for collecting data on frog locations. The Hillsborough County River Greenways Task Force/Frog Listening Network provides training, reporting sheets, a color frog and toad identification deck and a tape recording of frog and toad calls. While the program is currently targeting residents in Hillsborough, Polk,

They've been found to severely impact native freshwater mussel, snail, and crayfish populations as well as more direct impacts to humans such as clogging intake pipes to the point of closing down power plants.

Gary Warren, with the Florida Fish and Wildlife Conservation Commission, says that people trailering boats into northern states

Pinellas, Pasco, and Hernando counties, they want to hear from others interested in frog listening. Expansion and collaboration with the North American Amphibian Monitoring Program is being considered. For more information, call:

Jim Beever (941) 575-5765
Laura DeLise (813) 744-6100 ext 479

Bird Watching Program For Everyone

A Wings Over Florida Birding Program has been established by the Florida Fish and Wildlife Conservation Commission (formerly known as the Florida Game and Fresh Water Fish Commission) with the hopes of encouraging backyard bird watchers to identify and document birds they see. To participate you'll need a *Checklist of Florida Birds* booklet and a birding program application. For a free application packet and a copy of Bird Watching Basics, contact: Alex Kropp FWC/BWDC 620 S Meridian Street Tallahassee, FL 32300-1600 (850) 414-7929



Fish Consumption Advisories Now On-line

Anglers worried about mercury levels in the fish they're catching can now check out health advisories on-line. The Florida Fish and Wildlife Conservation Commission (FWC) provides health advisory listings for a number of Florida lakes at: <http://www.state.fl.us/gfc/fishing/health.html>

Don't have a computer? Call the FWC's General Information office and ask for a Fresh Water Fishing Regulation Booklet, which includes the listing, at (941) 648-3203.

Other contacts include your local County Public Health Department (see the blue pages of your phonebook) or call: Department of Health Bureau of Environmental Epidemiology (850) 488-3370.



Mark Your Calendar

Winter/Spring 2000

Landscaping for Wildlife Seminar Series
UF Extension Office / Tallahassee, FL

Ten seminars, January thru May, include sessions on water gardening, aquascaping ponds/lakes as well as native trees and shrubs for wildlife, backyard wildlife habitat design, etc. Sessions include both classroom and field activities. Participate in the entire series (\$30) or attend individual sessions (\$ 5 per).

Contact: Cindy Boyer (850) 487-3003

February 21

Fisheries Management for Lakes

Keystone Civic Center/Odessa

Workshop covers fish ID, biology, habitat, water quality and aquatic plant management for fisheries, as well as tips on how to become more involved in actively managing private lakes and ponds for fishing.

Carlos Fernandez (813) 272-5912 ext. 3616



March

Polk County Regional Meeting

Watch for your mailed invitation or check the FLW web site this month for details.

April

Osceola County Regional Meeting

Flagler County Regional Meeting

Watch for your mailed invitation or check the FLW web site this month for details.

May

Leon, Jefferson, Gadsden, Liberty, Madison, Wakulla, Jackson, & Taylor County Regional Meeting

Watch for your mailed invitation or check the FLW web site this month for details.

May 6

Lake, Pond and Stream Day

Hillsborough County / University of South Florida / Tampa, FL

LAKEWATCH staff will have aquatic plants on display for identification and discussion. State and environmental groups will have exhibits. Desirable aquatic plants will be given away, for "aquascapists." Free canoe rentals will be available, with the possibility of a race. Lunch on the water, and a kid's fishing derby. Water samples will be also be collected from LAKEWATCH volunteers.

Contact: John Brenneman (941) 533-0765

May 15-18

Aquatic Weed Control Short Course

Ft. Lauderdale Research Center / Ft. Lauderdale

A four-day course covering many aspects of controlling aquatic plants including plant identification, aquatic pest control workshop, plant propagation and culture workshop and pesticide application training.

Contact: Randall Stocker (352) 392-9612

May 22-25

11th Annual Meeting of the Florida Lake Management Society

Hawk's Caye Resort / Duck Key, FL

Meet the scientists behind lake and water management research. The general conference will begin on May 23 and continue through noon May 25. Special room rates of \$95/night are available from May 21-25. Technical sessions will feature a wide variety of topics related to water resources and lake management issues including non-point source management issues, lake restoration case studies, boating and personal watercraft (jetskis) impacts, volunteer monitoring programs, aquatic biology, water quality, wetlands, lake Apopka issues, water quality in the Florida Keys, etc. For those that cannot attend, a compilation of abstracts is available upon request.

For more information, contact:

Jeff Herr/Conference Chair (407) 855-9465

For hotel reservations, call Hawk's Caye at (800) 432-2242 or (305) 743-7000.



Dear Friend of Your Lake,

Do you have a concern about your lake and an interest in its future? If you have access to any type of boat, can spend two hours each month on your lake, and are willing to monitor for at least a year, you might be eligible for the Florida LAKEWATCH volunteer program.

Florida LAKEWATCH is currently the only research program gathering monthly data to study such a large number and a wide variety of Florida's lakes. However, without the help of volunteers, it would not be possible. Participants in the Florida LAKEWATCH program receive:

- * a free newsletter subscription
- * use of sampling materials
- * training in monitoring procedures
- * periodic reports and an annual report
- * access to lake experts (limnologists)
- * invitations to LAKEWATCH activities

For more information about how you can become a FLW volunteer, contact:

Florida LAKEWATCH

PO Box 110600

Gainesville, FL 32611

1-800-LAKEWATCH (1-800-525-3928)

E-mail: lakewat@ufl.edu

Web site address:

<http://www.ifas.ufl.edu/~lakewatch/index.htm>



Thank you!

To the **Friends of Lake Hickorynut** LAKEWATCHers for their generous donation of \$209.40. The money was raised at their annual Lake Hickorynut craft and yard sale. All food sale proceeds were donated to Florida LAKEWATCH. This annual donation is greatly appreciated!

Keep up the good work...

is the word from our hard-working staff in the water chemistry laboratory. And they'd like to remind everyone to continue to bring in your frozen water and algae samples as often as you can. This will facilitate smooth operations in processing the many thousands of samples each month and will help avoid delays in processing your data.



New faces in the water chemistry laboratory — Tad DeGroat (left) and Wanda Garfield. Welcome aboard!