

Florida LAKEWATCH



Dedicated to Sharing Information About Water Management and the Florida LAKEWATCH Program Volume 45 (2009)

We're Going Digital!



Toxic Algae: Should Floridians Be Worried?

These algae are an issue of increasing concern for scientists and community members alike. Especially in Florida, we have had our share of harmful algal blooms. But what if the algae are not just a nuisance, but a threat to our health? What if the algae are not just a nuisance, but a threat to our health? What if the algae are not just a nuisance, but a threat to our health?

When monitoring toxins produced by algae in freshwater systems, the focus of concern should be directed to the type of algae found in the system and the potential for human exposure. While these algae blooms are a nuisance, they are not a threat to our health. What if the algae are not just a nuisance, but a threat to our health? What if the algae are not just a nuisance, but a threat to our health?

Continued on page 2.

UNIVERSITY OF FLORIDA
IFAS



Florida LAKEWATCH Aquatic Bird Survey

The last time there was a census count in Florida waters, the situation in the Florida LAKEWATCH Aquatic Bird Survey was so dire that it was almost impossible to conduct. The survey was almost impossible to conduct. The survey was almost impossible to conduct. The survey was almost impossible to conduct.

The survey was almost impossible to conduct. The survey was almost impossible to conduct. The survey was almost impossible to conduct. The survey was almost impossible to conduct.

Continued on page 2.

UNIVERSITY OF FLORIDA
IFAS



Mary Stonceipher is Retiring!

Mary Stonceipher is retiring after 36 years of service to the State of Florida. Mary Stonceipher is retiring after 36 years of service to the State of Florida. Mary Stonceipher is retiring after 36 years of service to the State of Florida.

Mary Stonceipher is retiring after 36 years of service to the State of Florida. Mary Stonceipher is retiring after 36 years of service to the State of Florida. Mary Stonceipher is retiring after 36 years of service to the State of Florida.

Continued on page 2.

UNIVERSITY OF FLORIDA
IFAS

The Florida LAKEWATCH newsletter is going almost exclusively digital in order to reduce expenses. During these tough economic times LAKEWATCH is facing a 40% reduction in our budget and we are looking for ways to reduce our expenses. One of these ways is to reduce printing costs of our newsletter. This will also reduce the use of paper.

After this newsletter all future newsletters will only be available by downloading from our website unless you

specifically request a paper copy or we do not have an e-mail address for you on file. In the future you will get an e-mail notice telling you when the latest newsletter is available. This e-mail will provide a link for you to go to and download the latest version of the newsletter. You will need Acrobat Reader 5 or later to view the newsletter.

You will also need to add the listed e-mail addresses to your e-mail address book to avoid the notice going straight to your

spam folder. The e-mail notices will potentially be sent from these e-mail addresses.

dlwatson@ufl.edu
ejschulz@ufl.edu
djwillis@ufl.edu
larose@ufl.edu

We hope that this is not an inconvenience and thank you for your understanding as we attempt to weather this economic storm.



What is the Integrated Water Quality Assessment for Florida: 305(b) Report and 303(d) Report???

Many volunteers may have heard agencies and professionals refer to the 305(b) and 303(d) reports. These reports are discussed at both federal and state levels and are used to determine water quality changes and trends over time. This article provides a brief description of these reports.

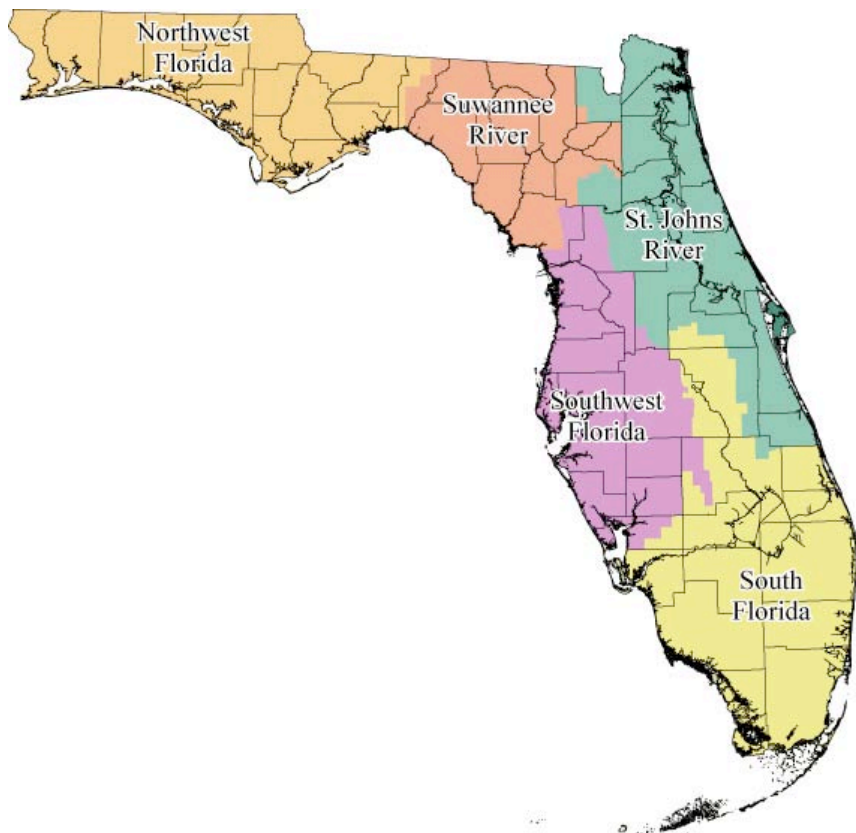
When professionals refer to the 305(b) and 303(d) reports they are actually referring to the Integrated Water Quality Assessment for Florida 305(b) and 303(d) Reports. These reports provide an overview of Florida's surface water and ground water quality trends to date. The Florida Department of Environmental Protection (FDEP), submits these reports to the U.S. Environmental Protection Agency (EPA) every two years as mandated by the requirements of Sections 305(b) and 303(d) of the Federal Clean Water Act of 1974. The Integrated Report "allows states to document whether water quality standards are being attained, the availability of data and information for each water body segment, identifies trends in water quality conditions, and provides information to managers in setting priorities for future actions to protect and restore the health of Florida's aquatic resources."

Under Section 305(b) of the Clean Water Act, each state must submit reports every other year to the EPA depicting water quality trends for surface water and ground water, major impacts to these waters, and determinations if water bodies are

attaining their designated uses (e.g. drinking water, recreation, and shellfish harvesting). Water bodies that do not meet their designated uses are deemed impaired under Section 303(d) of the Clean Water Act. States must then submit a list of impaired waters (the 303(d) list) to the EPA.

In Florida, FDEP must establish total maximum daily loads (TMDL's) for all impaired waters. A TMDL is the maximum amount of a given pollutant that a water body can assimilate and still maintain its designated use. Once a TMDL is established for a waterbody, a Basin Management

Action Plan (BMAP) is used to restore impaired waters by reducing pollutant loading to meet the allowable loading established by the TMDL. FDEP develops these broad-based plans with the help of local stakeholders and the plans are adopted by Secretarial Order in order to be enforceable. FDEP further incorporates TMDL's into their watershed management approach by focusing on each water basin, as opposed to individual cases. Florida's legislature divides the state's 52 basins into 29 groups distributed among five water management districts.



The regions of the five water management districts in the State of Florida.

FDEP evaluates Florida surface waters in five year cycles (20% of the state is assessed each year for five years). In addition to this evaluation, FDEP uses data from other Florida sources to make assessments of the water quality trends and meet the requirements of Sections 305(d) and 303(b) of the Clean Water Act. One of these other major data sources is Florida LAKEWATCH data!!!!

The 2008 Integrated Water Quality Assessment Report includes results from the

Approved TMDLs by EPA Fiscal Year (October 1 through September 30) since October 1, 1995

Fiscal Year	Number of TMDLs Approved	Percent Approved
1996	2	1.55
1998	11	1.89
2001	14	2.41
2002	7	1.20
2003	29	4.99
2004	55	9.47
2005	53	9.12
2006	105	18.07
2007	124	21.34
2008	138	23.75
2009	36	6.20

www.epa.gov/305b/

See volume 42 (2008) (<http://lakewatch.ifas.ufl.edu/NEWSLETT.HTM>) for more information on TMDLs and BMAPs.

completion of a five year cycle and suggest that 28% of rivers and streams, 25% of lake acres, and 59% of the square miles of estuaries evaluated experienced poorer water quality mostly associated with intense agriculture and industrial uses. As of 2008, FDEP has evaluated 100% of the state and will develop

approximately 2,565 TMDLs for 1,688 Florida waters. Of those waters, FDEP has developed, proposed, or adopted 322 TMDLs for 166 water bodies. Because, TMDLs are developed for individual pollutants, a water body may have multiple TMDL's. FDEP has completed or adopted by Secretarial Order BMAPs for the Upper Ocklawaha River Basin, Orange Creek, and Long Branch. See the Florida LAKEWATCH newsletter volume 42 (2008) (<http://lakewatch.ifas.ufl.edu/NEWSLETT.HTM>) for more information on TMDLs and BMAPs.

The USEPA website for accessing water quality assessments and TMDL's

The 2008 Integrated Water Quality Assessment for Florida: 305(b) Report and 303(d) Report is available for download at:
[http://www.dep.state.fl.us/water/docs/2008 Integrated Report.pdf](http://www.dep.state.fl.us/water/docs/2008_Integrated_Report.pdf).

These reports are available for each state. In addition to surface waters, ground waters and wetlands are also examined.

Algal Blooms in Florida Bay Test the Mettle of Spiny Lobsters

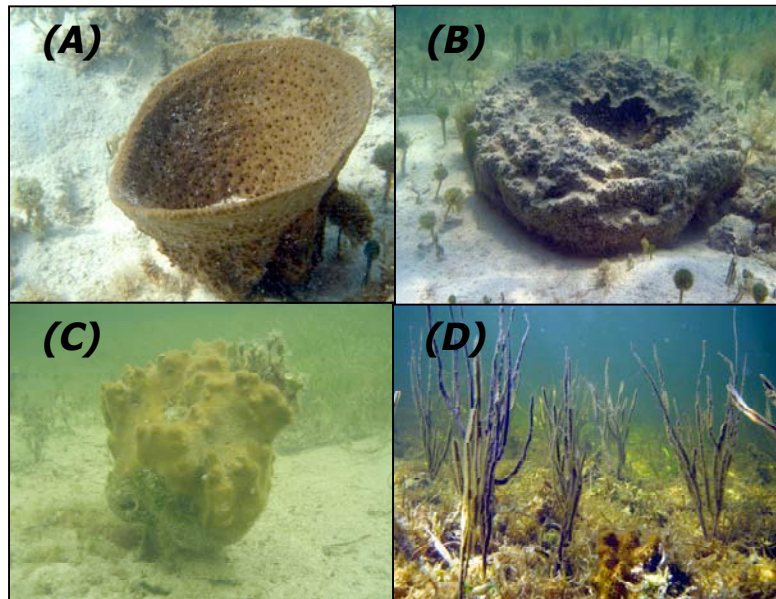
by Don Behringer, University of Florida and Mark Butler, IV, Old Dominion University

Harmful algal blooms impact freshwater systems as well as coastal marine and estuarine waters and their effect can vary widely depending on the type, intensity, and extent of the bloom. Determining the specific trigger for a bloom in coastal waters can be troublesome due to the complexity of these systems and the numerous interwoven factors involved such as salinity, temperature, nutrient levels and ratios, nutrient input sources, and day-length (photoperiod). Bloom effects can range from brief decreases in Secchi depth for benthic plants and algae during mild blooms to catastrophic kills of marine life during long, intense blooms or toxin-producing blooms. Florida Bay has received the worst of these and portions of the Bay were devastated as a result. The damage caused by these blooms has had cascading effects throughout the estuary.

Florida Bay is a broad estuary



Figure 1: Satellite image of Florida Bay



D. Behringer

Figure 2: Sessile (attached) organisms characteristic of hard-bottom habitat in western Florida Bay. (A) vase sponge, (B) loggerhead sponge, (C) coral head, (D) sea whips.

that receives freshwater from the Everglades and opens to the shallow marine habitats of the Florida Keys and Gulf of Mexico (Figure 1). The benthic habitats of western Florida Bay are a mixture of seagrass beds, open sand/mud areas, and hard-bottom habitat. The latter is composed of a thin layer of sediment covering a flat calcium carbonate rock substrate. Abundant and conspicuous organisms in hard-bottom

include sponges, sea whips, and small coral heads (Figure 2).

Hard-bottom is particularly sensitive to the persistent algal blooms which occasionally blanket the Florida Keys and Florida Bay, most recently in 2007. The causative agents for these blooms have been identified as several non-toxin producing species of the cyanobacteria in the genus *Synechococcus*. These are small chain-forming photosynthetic bacteria that thrive during abnormally low or high salinity periods when other phytoplankton do not. In the wake of bloom events, there is ample evidence for the devastating impact on the hard-

bottom sponge communities. Following a series of cyanobacteria blooms in the Florida Keys from 1991 to 1995, researchers described a cascade of disturbances through which the loss of large, structure-forming sponges had consequences for juvenile lobsters, which use them as a primary refuge. The 2007 bloom destroyed recovering and previously unimpacted hard-bottom sponge communities, killing close to 100% of the sponges in the core area of the bloom.

This area is a nursery habitat for many economically valuable or endangered organisms including Caribbean spiny lobsters, stone crabs, groupers (e.g., red, black, Nassau, and goliath), and snappers. Lobsters in particular, rely heavily on the shelter provided by large sponges (often approaching 1 meter wide!) and their abundance is often influenced by sponge abundance. Therefore, when these sponges are killed, lobsters are forced to aggregate in the few shelters that remain (Figure 3).

Spiny lobsters are social creatures, using their sensitive olfactory (smell) abilities to find each other and aggregate. However, they are also equipped with the olfactory

ability to detect and avoid other lobsters infected with a lethal disease. The infectious virus, termed PaV1, is the first virus described for any lobster species and has remarkable effects on their ecology. This disease affects primarily the juvenile lobsters that use Florida Bay as a nursery habitat. The disease avoidance behavior that healthy lobsters use results in isolation of infected individuals and reduced infection risk. This



M. Butler

Figure 3: Spiny lobsters aggregated under a coral head in a severely bloom-impacted region of hard-bottom. Nearly 100% of the sponges were killed at this site.

isolation was theorized to limit spread of infection among dense populations of lobsters, however, this theory was difficult to test in nature. That is, until the extensive bloom occurred in 2007.

The loss of sponges in large areas of Florida Bay hard-bottom dramatically increased the aggregation of lobsters in the remaining shelters. This

increased aggregation was a “natural test” of the effectiveness of avoidance behavior in reducing infection potential for this contact-transmitted disease. However, PaV1 infection prevalence did not increase on the bloom impacted sites relative to unimpacted sites following several months of increased aggregation, and was actually lower on impacted sites. The decrease in disease prevalence may have resulted from

increased predation on infected lobsters denied adequate shelter. Field experiments comparing predation on healthy versus diseased lobsters collected from the surrounding habitat also showed that diseased individuals were more susceptible to predation than their healthy counterparts.

Harmful algal blooms are a continuous threat to aquatic communities and

research is focused on determining the factors affecting bloom formation, maintenance, termination, and impacts. The work presented here highlights the need to consider the indirect effects of blooms on the whole aquatic ecosystem. However, it also demonstrates the adaptability and resilience that organisms such as the spiny lobster can display in the face of environmental adversity.

Is My Lake Spring Fed?



Will Strong

Ginnie Springs located in Gilchrist County, Florida.

“My lake is spring-fed!” We as regional coordinators hear it all the time from our Florida LAKEWATCH volunteers. When asked why they believe their lakes are spring fed, we usually get responses like, “Because, I can feel colder water down near my feet when I go swimming” or “My Grandpa told me so!” It is possible that some lakes are spring fed. For example, Lake Apopka is fed by Gourneck Springs. But, there may be other reasons for cooler water near the lake bottom and Grandpa may have been told that the lake was spring-fed by someone who had no evidence to back up their claim.

A lot depends on your definition of a spring. For most people, a spring is a localized hole in the ground from which lots of water flows. Major springs can pump out thousands or even millions of gallons of water on a daily basis including the famous Silver Springs (near Ocala), Blue Springs, and Itchetucknee Springs to name a few. Most volunteers would agree that these springs meet the criteria.

On some occasions lakes do actually receive water from springs. But, when volunteers who claim their lake is spring-fed are asked where the outflow from their lake is

located, they usually do not have an answer. After thinking about it for a little while, they admit that if a spring were feeding their lake, then the water would need to have a place to flow out. Otherwise, the lake would continue to fill up and flood their property. That’s when they begin scratching their heads.

If their lakes are not spring fed, then why do they feel cold water near the bottom? If you swim in a lake during the summer, you may notice that the deeper water near your feet

Continued on page 7.

feels cooler than the water near the surface. This is because the upper surface water layer has been warmed by the sun and as a result, has become less dense or “lighter” than the cooler, denser layer below near your feet. This warmer above/cooler below water layering effect is known as thermal stratification. A temperature difference of as little as one degree Fahrenheit can result in stratification. Since this is a natural phenomenon that can occur in all water bodies (even swimming pools) it is not necessarily evidence that the lake is spring-fed.

Sometimes a volunteer will report seeing little “springs” about 1 to 2 inches in diameter bubbling up in the shallow sediments near the lake shoreline. In Florida, most lakes receive their water from direct rainfall, inflow from streams, and groundwater infiltration. Groundwater is water that has been deposited on the land by rainfall that then filters through the soil until it hits an impervious layer of rock, mineralized soil, or clay. This impenetrable layer stops the downward movement of the water and causes it to move laterally or sideways.

When this underground water moves towards a low spot (like a lake), the water can sometimes be seen percolating through the bottom sediments of the lake and adding water to the lake. Sometimes you can even see this infiltration



Dan Willis

Anglers on Woodbine Springs in Santa Rosa County.

occurring in the shallow, sandy sediments and it looks like tiny little “poofs” of sand puffing up from the bottom. Some people may even refer to these observations as being “little springs” because they are under pressure and cause the sands to lift as the water flows in.

As a final thought to ponder, in Florida most natural springs usually have a year-round temperature of about 72 degrees Fahrenheit. So in the summer, a lake that is spring-

fed will have cooler water near the bottom and warmer water near the surface, as volunteers have reported. However, in the winter the same lake could have warmer water on the bottom near the spring and cooler water on top if air temperatures get cold enough. In fact, this observation would be stronger evidence that a lake is spring-fed than would the observation made in the summer.

Volunteer Bulletin Board

Notice to all Florida LAKEWATCH active samplers

Keep those samples flowing!
Please be sure to deliver all frozen water and chlorophyll samples to your collection center as soon as possible. This will allow us to collect and process them in a timely manner.
Thanks for you help!



Collection Center Closings

The following collection centers have been closed and are no longer available for sample drop-off and new supply pickup.

Marianna

Elder Care Services Marianna Office
4297 Liddon St
Marinna, FL 32446

Miami

Deering Estate
16701 SW 72nd Ave
Miami, FL 33157

If you use one of these collection centers please call us at 1-800-525-3928 for an alternative collection center location.

A Gateway to Florida's Lakes

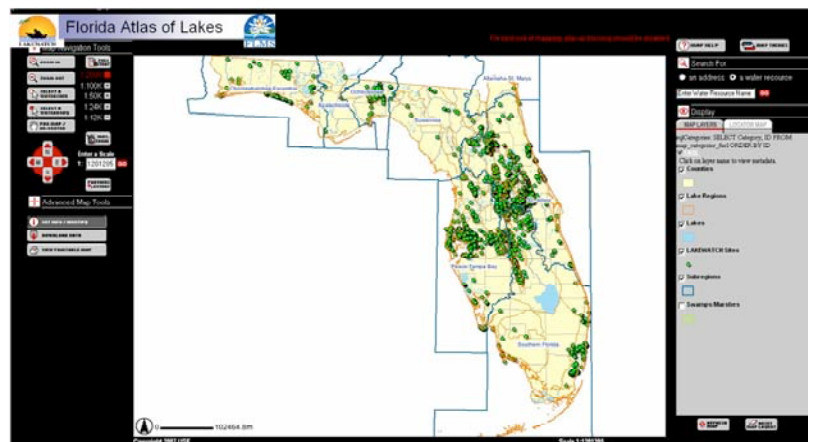
As reported in Vol. 39 of the LAKEWATCH newsletter, Florida LAKEWATCH, the Florida Center for Community Design and Research at the University of South Florida and the Florida Lake Management Society have teamed up to provide easy access to data for all LAKEWATCH lakes. This service is implemented as the "Florida Atlas of Lakes" found at the Water Atlas website (www.wateratlas.org).

This statewide atlas has the key water chemistry data that is generated by the Florida LAKEWATCH program. The Florida Atlas of Lakes manage and deliver data through a map interface. LAKEWATCH sites are matched to map themes based on the 1:24,000 scale National Hydrology Database (NHD). Additional map themes are then added to the base map to create the map that is used as a key element of the database.

The Florida Atlas of Lakes allows the citizens of Florida to better understand and appreciate the important work that is done on their behalf by Florida LAKEWATCH volunteers. Users are able to view data for any of the waterbodies in the Florida LAKEWATCH program.

To visit the Florida Atlas of Lakes go to the website listed below:

<http://www.wateratlas.usf.edu/AtlasOfLakes/Florida/>



The Florida Atlas of Lakes

LAB NOTES

From Florida LAKEWATCH Chemist



Claude Brown, Chemist

Greetings all LAKEWATCHERS!

Everyone in the lab would like to express their heart-felt thanks for your continued sampling efforts and years of dedicated hard work.

As you work hard to collect and process your samples, the folks in the lab want to be sure you get the best and most accurate results possible. Occasionally, we run into a few problems we would like your help to correct in order to get your results back to you as expeditiously as possible. These gentle reminders should be reviewed and shared with those folks helping you sample your lake.

Problem:

Cracked water bottles resulting from bottles being over-filled before freezing.

Solution

When collecting water bottles please fill completely and then pour out some water until you get down to the shoulder of the collection bottle, as this will allow for expansion of the water upon freezing.

Problem:

Chlorophyll filters exposed.

Solution

When folding your algae sample filters, please be sure to fold them exactly in half, with the algae on the inside. (Pretend you're making an "algae taco.") If any part of the algae sample is uncovered and exposed while putting the filter into its wrapper, some of it can rub off the sample filter and stick to the outside wrapper. That portion of the algae is lost and the sample is less than accurate.

Problem

Unlabeled filters or missing information.

Solution

Labeled filters help us keep track of chlorophyll and corresponding water samples as they pass through the lab. A quick double-check to be sure the lake

name/county, date, and amount filtered are recorded is important to get results back to you, our volunteer. In particular the amount filtered is essential to the actual calculations used to determine chlorophyll concentrations.

Problem:

Filters not stored in silica gel dessicant.

Solution:

Filters must be stored in the bottles of silica gel dessicant provided to prevent degradation of your sample due to mold growth.

Problem:

Missing information on data sheets.

Solution:

We ask that you complete the lake/county, date, and write both Secchi depth and water depth measurements on the sheet in the space provided. Visibility and depth information is entered in the long-term database along with your chlorophyll results. Missing information on the data sheet can lead to a delay in information relayed back to you.

You work hard to collect these samples and we all want them to be the very best they can be. Thanks for your help and keep up the good work!

Invasive Plant Management: Florida Fish and Wildlife Conservation Commission's New Role

In the past if you had an aquatic plant problem and/or needed an aquatic plant removal permit you would contact the Florida Department of Environmental Protection's Bureau of Invasive Plant Management. However, that has changed. The Florida Department of Environmental Protection's Bureau of Invasive Plant Management is now the Invasive Plant Management Section within the Florida Fish and Wildlife Conservation Commission's (FWC) Division of Habitat and Species.

The Invasive Plant Management Section is responsible for coordinating and funding two statewide programs controlling invasive aquatic and upland plants on public conservation lands and waterways. These invasive plant management programs are the largest of their kind in the United States. This section also insures that beneficial native aquatic plants in ponds, lakes, and rivers are protected through its permitting programs and funds invasive plant management research to ensure that the most cost-effective and environmentally safe control methods are used.

Aquatic vegetation plays an important role in maintaining and protecting water quality, providing shoreline

stabilization and ensuring balanced fish and wildlife populations. Therefore, Florida law requires all persons or public agencies intending to control, eradicate, remove, or otherwise alter any aquatic weeds or plants in waters of the state to obtain a permit from the FWC unless an exemption for the activity has been provide in statute or rule.

The FWC Invasive Plant Management Section regional and field offices throughout the state provide the following functions:

- Provide extension/education services concerning aquatic plant management
- Annually survey the aquatic plant communities in approximately 450 public water bodies
- Direct, review and monitor the control of non-native aquatic plants by contactors of FWC
- Assist and coordinate with federal, state and local governments on issues related to aquatic plant management
- Regulate aquatic plant management activities through two permitting programs
- Perform compliance/enforcement activities related to aquatic plant management

Regions and Field Offices

Northwest Florida Office
3900 Commonwealth Blvd., MS705
Tallahassee, FL 32399

Matt Phillips
(Mattv.Phillips@MyFWC.com)
850-245-2809

Counties: Bay, Calhoun, Escambia, Franklin, Gadsden, Gulf, Holmes, Jackson, Leon, Liberty, Okaloosa, Santa Rosa, Wakulla, Walton, Washington, and Jefferson.

Suwannee River Office
341 SE Charmont Lane
Lake City, FL 32025

Joe Hinkle
(Joe.Hinkle@MyFWC.com)
386-758-0464

Counties: Alachua, Baker, Bradford, Clay, Columbia, Dixie, Duval, Gilchrist, Hamilton, Lafayette, Madison, Nassau, Putnam, Suwannee, Taylor, and Union.

Southwest Florida Office
6355 South Florida Avenue
Floral City, FL 34436

Robbie Lovestrand
(Robbie.Lovestrand@MyFWC.com)
Terry Sullivan
(Terry.Sullivan@MyFWC.com)
352-726-8622

Counties: Citrus, Hernando, Levy, Marion, and Sumter.

North Central Office
601 W. Woodward Avenue
Eustis, FL 32726

Nathalie Visscher
(Nathalie.Visscher@MyFWC.com)
321-228-3364

Counties: Lake

Continued on page 12

Outstanding LAKEWATCH Volunteer

LAKEWATCH would like to recognize Arthur Morlan Dutton for his service to the LAKEWATCH program. Arthur was trained to sample Lake Georgia in 1989 by Sandy Fisher (retired LAKEWATCH Director). Lake Georgia is located in Winter Park (Orange County) between Hwy 417 and North Dean Road just North of University Boulevard (28° 36' 23" and 81°

14' 47"). Arthur either sampled or helped sample the lake for a total of 228 months. We regret to say that Art passed away on November 5, 2008. His service and commitment to the program will be greatly missed.

He was born on July 28, 1923 to Arthur and Letta Morlan Dutton. He attended Iowa State where he received a Bachelor of Science degree in Electrical Engineering and a PH.D. in Mathematics and Statistics. Arthur was in the Navy during World War II and while serving he attended

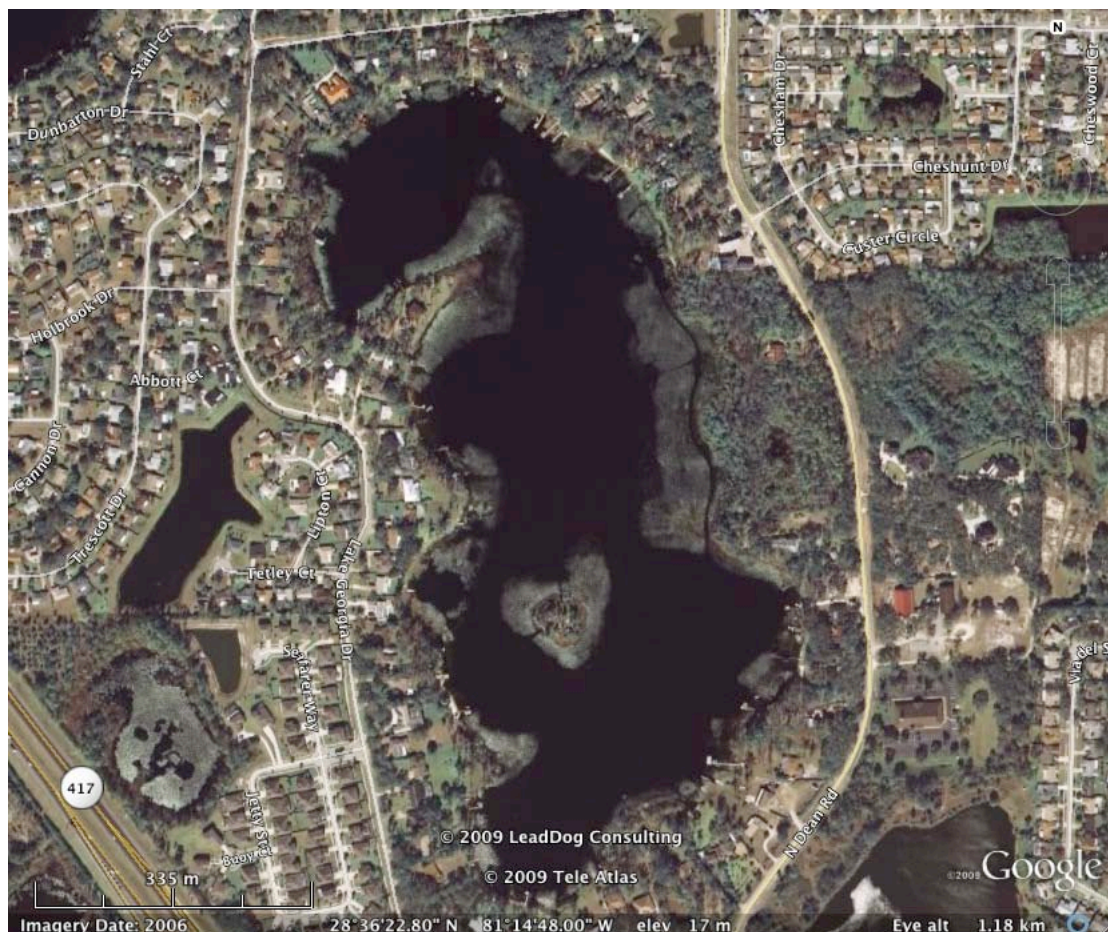
Japanese language school. After the Navy he went to work at the University of Rochester in

Rochester, New York. Then, he moved to Orlando, Florida in 1968. He was chairman of Math Sciences at University of Central Florida (UCF), formally known as Florida Technological University. He was in the statistics Department of UCF until his retirement.

Art is survived by his wife Joanne McHenry Dutton, their son, David

Benjamin and granddaughter Christina and three great-grandchildren.

The pleasure of having Arthur as a volunteer was all ours. We do not come across volunteers like Arthur very often. The dedication to the program for Lake Georgia goes beyond anything we could have hoped for from a volunteer when the program was created.



An areiel view of Lake Georgia in Orange County.

(Cindy) and daughter, their daughter Margaret "Maggie" (Michael) Ziesmer, grandson

We wish the best to his family and our dearest gratitude for his efforts.

Florida



LAKEWATCH

This newsletter is generated by the Florida LAKEWATCH program, within UF/IFAS. 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:

Florida LAKEWATCH
Fisheries and Aquatic Sciences
School of Forest Resources and Conservation

7922NW71stStreet

Gainesville,FL 32653

or call

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

(352)392-4817

E-mail: fl-lakewatch@ufl.edu

<http://lakewatch.ifas.ufl.edu/>

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

Invasive Plant Management: Florida Fish and Wildlife Conservation Commission's New Role (Continued from page 10)

St. John's River Office

5882 South Semoran Blvd.
Orlando, FL 32822
Ed Harris (Ed.Harris@MyFWC.com)
407-275-4004

Counties: Brevard, Flagler, Orange,
Osceola, Seminole, St. Johns, and
Volusia.

South Central Florida Office

2001 Homeland-Garfield Road
Bartow, FL 33830

-Highlands

Erica VanHorn
(Erica.VanHorn@MyFWC.com)

-Polk

Kelle Sullivan
(Kelle.Sullivan@MyFWC.com)
Danielle Schobl
(Danielle.Schobl@MyFWC.com)
863-534-7074

Counties: Highlands and Polk

South Gulf Office

8302 Laurel Fair Circle, Suite 140
Tampa, FL 33610

David Demmi
(David.Demmi@MyFWC.com)

John Rodgers
(John.Rodgers@MyFWC.com)
813-744-6163

Counties: Charlotte, Desoto, Hardee,
Hillsborough, Lee, Manatee, Pasco,
Pinellas, and Sarasota.

South Florida Office

9737 Gumbo Limbo Lane
Jensen Beach, FL 34957

Jackie Smith
(Jackie.Smith@MyFWC.com)

772-871-5407

Counties: Broward, Collier, Glades,
Hendry, Indian River, Martin, Miami-
Dade, Monroe, Okeechobee, Palm
Beach, and St. Lucie.

Information for the article was taken from the Florida Fish and Wildlife Conservation Commission's website at MyFWC.com.