

Dedicated to Sharing Information About Water Management and the Florida LAKEWATCH Program

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INSIDE THIS ISSUE:	
ALGAL BLOOM MONITORING RESOURCE (FDEP) BY Jason "MO" Bennett	2
WATER LETTUCE, <i>Pistia stratiotes</i> : MANAGE IT, OR LET NATURE TAKE ITS COURSE? By Dr. Jason Ferrell	4
LIVING AND WORKING SAFELY IN THE FLORIDA SUN By Dr. Lindsey Werner	8
FATHER'S DAY FEATURE: A FAMILY'S LOVE FOR THE WATER BECOMES AN ACT OF SERVICE By Tory Moore	12
LAKES APPRECIATION MONTH AND THE SECCHI DIP-IN	13



ALGAL BLOOM MONITORING RESOURCE

BY JASON "MO" BENNETT, FLORIDA LAKEWATCH REGIONAL COORDINATOR



Longer, warmer Summer days in Florida provide optimal growing conditions in our waterbodies. Algae can take advantage of these conditions and cause algal blooms (large increases in algal abundance) across the state. Unfortunately, some of these algae, such as Blue-green algae, or cyanobacteria, can contain toxins, such as microcystin. These toxins are released into the waterbody and at high enough levels can be harmful to hu-

mans and animals, so monitoring their occurrence is important for public health. The Florida Department of Environmental Protection (FDEP) has a program for this, which includes a web-based platform for reporting blooms, finding data, receiving updates, and learning information about their algal sampling efforts. The FDEP Algal Bloom Dashboard can be found at https://floridadep.gov/AlgalBloom.



Figure 1: The FDEP Algal Bloom Sampling Status Dashboard (www.floridadep.gov/AlgalBloom)

How the dashboard works:

The dashboard contains an interactive map with colored dots to indicate the locations FDEP has made site visits. These are conducted by a bloom response team that typically takes samples. Clicking on the dots will open windows containing reports for each time a waterbody has been sampled for algae and algal toxins. You can also sign up for regular emails from FDEP to keep you informed of their testing efforts and results Figure 2: Screenshot of a report window showing the presence of microcystin toxins found in Lake Weir in Marion County.



You can report a potential bloom directly to the FDEP by following the instructions provided on the dashboard tab "Report Algal Blooms". They will ask for basic information about where the potential bloom is located and give options for uploading pictures of the bloom to help with characterization. The FDEP will assign an employee based nearest to the bloom to sample the waterbody and begin a report. FDEP will only sample <u>publicly accessible</u> waterbodies; so private and private access only waterbodies are not eligible for this program. Once a sample has been taken the field biologist will add observations to the report and the sample will be shipped overnight to the FDEP lab in Tallahassee. Algal identification in the lab can be done within a day of the lab receiving the sample. Toxin analysis is performed in batches twice a week. Once those results are available, they are added to the reports on the dashboard.

If any toxins are found the FDEP sends this information to the Florida Department of Health (FDOH) for distribution to the individual county department of health (CDOH). Once receiving that information, the CDOH is responsible for notifying citizens of the presence of toxins in the waterbody, and for making recommendations for what activities and uses within the waterbody should be avoided. If toxins are present, FDEP alerts FDOH and the CDOH determines the appropriate response. The World Health Organization (WHO) has established exposure recommendations of $1\mu g/L$ of toxin for drinking water, but for recreational activities are $10 \ \mu g/L$ for low probability of adverse health effects, and $20 \ \mu g/L$ for moderate probability of adverse health effects.

How this information is released to the public is up to the individual CDOH. For example, in April of this year Marion County released information on toxins present in Lake Weir via TV and radio news releases. Alternatively, Putnam County chose to alert Lake Winnott residents by placing flyers in their mailboxes. Unless otherwise stated by the CDOH or other local authority, adhering to the WHO recommended restricted activities is voluntary and dependent on your individual assessment of risk. Special consideration should be paid to activities with children and animals due to their small size and their likelihood of ingesting the water while in it. This resource belongs to the citizens of Florida. So feel free to use it as needed to keep yourself informed about the waterbodies you use.

Figure 3: Alerts regarding toxins from algal blooms released by Putnam and Marion Counties in April 2021 https://www.wcjb.com/video/2021/05/18/health-officials-warn-be-careful-when-visiting-lake-weir/



WATER LETTUCE, *Pistia stratiotes*: MANAGE IT, OR LET NATURE TAKE ITS COURSE?

BY DR. JASON FERRELL, UF/IFAS CENTER FOR AQUATIC ANS INVASIVE PLANTS DIRECTOR



Water lettuce is one of the usual suspects, a common vagrant, targeted for management on just

about every lake and stream in Florida every year. This floating plant reproduces quickly and forms large mats that can block boat ramps and be a serious nuisance. However, managing this plant has become rather contentious in recent years. Some



will point to the fact that water lettuce was clearly documented by both John and William Bartram as they surveyed Florida in the 1700s. They explain these references indicate water lettuce is a native plant and should be left to thrive. Next, they point out that water lettuce grew unchecked for hundreds of years and Florida's natural ecosystems was healthy and vibrant. Why, then, has this plant been targeted as a public enemy for the past 40 years? If nature managed this plant with little issue for hundreds of years, why not let it do the same now?

Honestly, this is a great question that uses both sound logic and reason. To answer the question, we have to ask ourselves another, equally important, question: what is different now vs 300 years ago? Is water lettuce different? Is it more aggressive, more reproductive, more troublesome than in the past? Science suggests water lettuce has not changed and behaves strikingly similar to how it did centuries ago. The next question is naturally, is Florida different now than it was 300 years ago. I believe that even the casual observer would agree Florida has undergone radical changes in the past 50 years, not to mention the last 300. Simply put, water lettuce has not changed, but Florida has. Florida lakes, as a rule, are rather shallow – often with an average depth of 4-6 feet. However, the subtropical climate of Florida brings near 60" of rainfall annually, with 2/3 of this total occurring between June and September. Historically, these summer rains resulted in dramatic increases in water depth, with some lakes documented to raise 5-8 feet in the summer months. This massive fluctuation would flood large areas and force floating plants and muck sediments to be flushed out and stranded when the water receded in fall/ winter. For centuries, this was how shallow lakes in Florida cleaned and reset themselves. This routine and dramatic flooding was anticipated by the 34,000 residents that called Florida home in the 1830's (this seems to be the first reliable Census record). There was plenty of land per person and avoiding floodplains was rather easy. However, as the population of Florida steadily grew, avoiding flooding became more difficult.

In 1947, just 19 years after the Okeechobee Hurricane caused massive destruction and loss of life, the Cape Sable Hurricane crossed the state and caused considerable flooding. It is reported that approximately 5,000,000 acres of peninsular Florida was covered with 6 inches to 10 feet of water. This inevitably led to the formation of Flood Control districts in 1949, which ultimately became the Water Management Districts in 1972. As a result, many of our lakes now have water control structures that prevent flooding by preventing wild fluctuations in depth. Meanwhile miles of canals and hundreds of pump stations were installed across the state to move water quickly and efficiently to maintain safe water levels.

So, what does all this have to do with water lettuce? Well, let us return to Bartram.

"...pistia, which send down very long fibrous roots deep into the water by which they are nourished, growing all matted together in such a manner as to stop up the mouth of a large creek..."

These tangled roots slow water flow, not to mention the floating plants can lodge against flood structures. Rafts of plants alter the functionality of the structure, or even cause damage if the populations are high enough.

Water lettuce is a proper threat to flood control. In Bartram's day, with only a few thousand people in Florida, flood prevention was not a pressing issue. But today, with over 21 million residents, flood control is essential for Florida and managing plants like water lettuce is of primary importance.

A second consideration is legislative. Bartram would have never thought plant management laws would become necessary, but today they are a reality. Florida statute, under the Florida Aquatic Weed Control Act, now requires the Florida Fish and Wildlife Conservation Commission to:

"...direct the control, eradication, and regulation of noxious aquatic weeds and direct the research and planning related to these activities...so as to protect human health, safety, and recreation and, to the greatest degree practicable, prevent injury to plant and animal life and property."

Why should water lettuce be controlled when for hundreds of years it was not necessary? The simple answer is that the plants have not changed, but Florida has. Our massive state population requires protection from flooding and simply managing floating plants is key step toward making this happen.

Dr. Jason Ferrell, UF/IFAS CAIP Director, wrote this piece. Any questions should be directed to Shelby Oesterreicher at <u>soesterreicher@ufl.edu</u>. For more information about the UF/IFAS Center for Aquatic and Invasive Plants, please visit <u>http://plants.ifas.ufl.edu</u>. Be sure to follow us on social @UFIFASCAIP.

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2. https://www.weather.gov/safety/flood-states-fl

3. John Bartram and Francis Harper. Diary of a Journey through the Carolinas, Georgia, and Florida from July 1, 1765, to April 10, 1766. <u>https://www.jstor.org/stable/pdf/1005551.pdf</u> P. 39

4. http://www.flsenate.gov/Laws/Statutes/2011/369.20

^{1. &}lt;u>https://web.archive.org/web/20141121134738/http://www.census.gov/population/www/</u> <u>documentation/twps0056/tabs15-65.pdf</u>

LIVING AND WORKING SAFELY IN THE FLORIDA SUN

BY DR. LINDSEY WERNER



Dr. Lindsey Warner is a pediatric physician who received his MD at the University of Central Florida. A Florida native, he has taken great interest in sun safety and skin cancer prevention. Outside of medicine, Dr. Warner enjoys bird watching, scuba diving and spending time on the water.

Living and working in Florida's sunny subtropical climate poses challenges both to our health and our environment. As we learn more about sun exposure's detrimental effects, sun protection is becoming ever more crucial. In this article, I will briefly walk you through the basics of UV exposure, sunscreens, their environmental impact, UPF clothing, and what it is they protect you against.



Let me start by taking us briefly back to what is sunlight. Sunlight actually consists of multiple wavelengths of electromagnetic energy that radiates from the sun, through our atmosphere and into our environment. The most damaging wavelength is called Ultraviolet (UV) light which is further divided into UVA and UVB. UVA waves penetrate the bottom-most layer of skin causing skin thinning, wrinkles, and tanning. UVB waves radiate the top layers of the skin, causing sunburn and most skin cancers.

Sun exposure in Florida can be especially damaging due to our proximity to the equator. The national weather service regularly tests the strength of UV radiation in most major US cities. This information is also included on most weather apps under "UV index." What you will

see is a number between 0 and 15 indicating the severity of radiation exposure in your area for that day. The higher the rating, the shorter the time in direct sunlight required to cause skin damage. Here in Florida, it only takes 15-25 minutes unprotected in the sun to cause cellular damage to your skin. This cellular damage triggers your pigment cells, melanocytes, to release more pigment, which is why people "tan" after sun exposure, but also increases the risk of cancerous mutations to the DNA of the skin.

The mainstays of sun protection, are wearing UPF clothing and sunscreen, seeking shade,

and avoiding mid-day sun. Sunscreen acts by either deflecting or absorbing UV radiation before it can penetrate and damage our skin. Sunscreens that have titanium or zinc oxide listed under active ingredients work by deflecting light and are known as "physical/mineral blockers." These earth metals work very well as they can be compounded into creams giving us all the benefits of a suit of armor with none of the bulk. They are, however, more difficult to "rub in" and leave a white sheen on the skin. The other type of sunscreen, "chemical blockers/organic filters," acts



by absorbing the energy of the UV radiation into their chemical structure and releasing the energy as heat. They typically contain avobenzone, homosalate, octisalate, and octocrylene (usually all four together, in that order). Understandably these can be irritating to sensitive skin. On the other hand, they are easier to rub in, lighter weight, and less greasy. It is also important to note that not all ingredients block both UVA and UVB, in fact, of the ones discussed above only zinc, titanium, and avobenzone protect against UVA.



Now choosing the SPF is our next big step. SPF stands for sun protection factor and tells us what percent of UVB rays are blocked, which increases with increasing SPF though not in a one-to-one fashion. SPF 15 blocks 94% of UVB waves, and SPF 100 blocks 99%. So increasing SPF does marginally increase your UVB protection. Unfortunately, SPF tells you nothing about UVA protection. To make sure your sunscreen is also protecting you against damage from UVA radiation, look for a "broad spectrum" designation on the label, which is an FDA-regulated designation that assures UVA protection. In terms of the official recommendation, the American Academy of Dermatology recommends using 30 SPF or greater, broad spectrum, water resistant sunscreen. The sunscreen pictured is my personal favorite and I have highlighted the parts of the label I use to inform my choice (mineral/physical blocker, broad-spectrum, and reef-friendly).

What about sunscreen and the aquatic environment? This is certainly an important consideration when choosing a sunscreen, and especially pertinent in this field. It is estimated that 7 to 14 thousand tons of sunscreen enter our oceans per year and have been linked to the global decline and loss of coral reefs. In 2015 the US National Aquarium and US National Oceanic and Atmospheric Administration published a cornerstone study, led by Dr. Craig Downs, which found that oxybenzone (a common chemical sunscreen ingredient) even in concentrations of 62 parts per trillion, caused coral cell toxicity. In response to this new information, Hawaii has recently successfully banned the sale of all sunscreens containing oxybenzone or octinoxate, on January 1, 2021. Though most research has been conducted in salt-water organisms, it is likely to be



equally damaging to their fresh-water counterparts. Additionally, oxybenzone is very difficult to remove from wastewater, and even land-bound folks would do well to avoid increasing environmental exposure to these chemicals.

This brings us nicely to the benefits of UPF clothing. UPF stands for ultraviolet protection factor and describes both UVA and UVB protection conferred by clothing. A UPF rating of 50 indicates that 1/50 of UV rays reach your skin, or conversely, 49/50 (98%) of rays are blocked. Fabric's ability to block UV radiation is determined by the density of the weave or thread count and the types of dyes used. In fact, many darker articles of loose fitting, synthetic clothing offer good sun protection. As a rule of thumb, holding a fabric up to the light will give you a good idea of how much light will reach your



skin. For example, a dark-colored polyester shirt has a UPF of 30+ (97% of UV rays blocked). A quick look into most of our wardrobes will show us that we have some sun-protective clothing already. All-together, UPF clothing provides an environmentally safe, low hassle option that is my personal favorite and go-to. Though you may not get style points for a large, brimmed hat and fullcoverage clothing, the ease and environmental benefits are unparalleled. Lastly, let's discuss why we care about sun protection: skin cancer. Prolonged exposure to UV radiation causes alterations in the DNA of our skin cells.

In the US, skin cancer is the single most common cancer, and one in five people will develop it according to the American Academy of Dermatology. Risk factors include occu-

pational exposure, tanning bed use, lighter complexion, and having immune problems. The three most common types of skin cancers are basal cell, squamous cell, and melanoma, and they are named after the types of skin cells affected. The deadliest, and most rare, is melanoma, a cancer of the pigment-producing melanocytes that can invade lymph nodes and spread if untreated. The American Cancer Society reports that in the US, it is responsible for 20 deaths a day and more than 100,000 cases of invasive melanoma were diagnosed last year. Fortunately, relative to other cancers, skin cancer has a very good survival rate of >92% if caught early and treated. Because early detection is key, it is important to establish care with a dermatologist both for timely treatment and to learn more about prevention and identification of worrisome skin spots.



To summarize our key points, sunlight contains ultraviolet radiation that causes cellular damage/burn in a matter of 15-25 minutes here in Florida. UPF clothing or dark, loose-fitting fabrics are a convenient and environmentally safe way to protect your skin. For the exposed parts of your skin, look for reef-friendly, water resistant, broad-spectrum, 30+ SPF sunscreen. When it comes to sun exposure, skin protection equals cancer prevention. Skin cancer impacts one in 5 people in the US. Stay safe out there!

FATHER'S DAY FEATURE: A FAMILY'S LOVE FOR THE WATER BE-COMES AN ACT OF SERVICE

BY TORY MOORE, public relations specialist with UF/IFAS Communications

This is an excerpt, the full article can be found at http://blogs.ifas.ufl.edu/news/2021/06/17/fathersday-feature-lakewatch/



The Wetzel family Courtesy: Matt Wetzel

To the Wetzel family, a perfect day is one spent on the water fishing and enjoying each other's company. For the past 10 years, they have added a volunteer component to their outdoors time by collecting samples for Florida LAKEWATCH.

The family consists of Matt and children Kylie, 23; Owen, 21; Andrew, 18; and Matt's girlfriend Evan and her children Robbie, Lexie, 18; and Luke, 11. Every member of the family has partici-

pated in sampling. That includes Otter, the family's German shorthaired pointer who is the official co-captain.

"When the kids were small, I started taking them kayaking, camping, and fishing all over the state," said Matt Wetzel. "We have kayaked many places from the Keys to the Suwanee River. The kids were in every nearby saltwater fishing tournament we could afford to be in and fished out of their kayaks."

"We now have a large family and are very active with anything to do with water," he said. "We fresh- and saltwater fish constantly, with the Kissimmee chain of lakes being our freshwater home, and the Indian River being our saltwater home."

"We have always been interested in our waterways and how they are managed," he said. "We started volunteering for LAKEWATCH because it sounded like something we would enjoy doing and would give us access to some interesting lakes that we could kayak. I inquired if the time spent could count towards the high school volunteer credits needed to attend college. It did, so my daughter Kylie started immediately." Now, the entire family has been involved and collecting samples is part of their regular outings.

"The importance of volunteers like Matt and his family is that they join a larger LAKE-WATCH family, collectively providing statewide quality data that are used for research by UF/IFAS staff and graduate students, as well as management by local, county, state and federal organizations," said LAKEWATCH director, Mark Hoyer. "The research also leads to outreach information which educates Florida citizens on how to be the best stewards of our valuable water resources. These efforts successfully close the circle on UF's land grant mission of research, teaching and Extension."

"I think that the only thing keeping the program from being more popular and used for educational purposes is that the younger crowds just don't know about it yet," Matt said. "We share the program with everyone in our club and many show an interest. Of course, they also like the idea of getting their volunteer hours while out on the water."

"For our family, time on the water allows us to bond more with nature and with each other," he said. "Some of our best memories have been shared on the boat, including while volunteering for LAKEWATCH. Since the water plays such a valuable role in our lives and wellbeing, we look forward to helping sustain our waters for future generations."

LAKES APPRECIATION MONTH AND THE SECCHI DIP-IN

Don't forget, July is Lakes Appreciation Month. Please participate in the Secchi Dip-In to ap-

preciate your lake!

The Secchi Dip-In is a demonstration of the potential of volunteer monitors to gather environmentally important information on our lakes, rivers, and estuaries. Volunteers have been submitting information during the annual Dip-In since



1994. Please join them in this international effort to track changes in water quality! Although we gladly welcome data year-round, we have historically observed the Secchi Dip-In during <u>Lakes Appreciation Month</u>, where we celebrate our lakes throughout the month of July each year. For more details visit https://www.nalms.org/ secchidipin/ Have a great photo from a day out on the water?

An inspiring story to share?

A fun fact or recipe?

We would love to see what you've got. Send your submissions to:

FL-LAKEWATCH@UFL.EDU



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Florida LAKEWATCH Fisheries and Aquatic Sciences School of Forest Fisheries and Geomatics Sciences PO Box 110600 Gainesville FL 32611-0600 or call 1-800-LAKEWATCH (800-525-3928), (352) 392-4817, E-mail: <u>fl-lakewatch@ufl.edu</u> Website: <u>http://lakewatch.ifas.ufl.edu/</u>

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