

aqua-notes

An Equal Opportunity Institution

SOLUTIONS

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Mark your calendars...

- August 5—Plant selection for coastal restoration in the era of climate change workshop. 8-5, UF Whitney Lab (Marineland, FL). \$35. Register at plantsclimatechange.eventbrite.com.
- More on back page!

Apologies for a late newsletter

We are currently having new floors installed in the Flagler County Extension Office...which has required us to move all of the contents of our offices into the auditorium (and we are working out of the auditorium...with 2 phone lines and no printing capability. That, combined with teaching two workshops the first week of August



threw my schedule a bit out of whack!

M. P. McGuire

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Warm weather + rainfall may = fish kills

As we become fully entrenched in summer, the combination of hot temperatures and afternoon rain events can lead to problems for fish in ponds, lakes or embayments. In water bodies with limited water flow or mixing, dissolved oxygen can be in short supply, especially as water temperatures warm up. Most fish cannot utilize oxygen gas—they can only absorb oxygen that is dissolved in water (referred to as dissolved oxygen, or simply DO). Cold water can hold lots of dissolved oxygen, but warmer water cannot. To visualize this, think about what happens when we heat a pan of water on the stove. Bubbles start to form—these bubbles are gas rapidly coming out of solution at extremely high temperatures. (continued on pg. 2)

If you notice a fish kill in a natural, public water body (i.e. not a storm-water pond or private lake), please report it to the state's fish kill hotline. This can be done online at <http://myfwc.com/fishkill> or by phone at 1-800-636-0511.

Warm weather + rainfall may = fish kills (continued from pg. 1)

A second factor that can reduce the amount of DO available to fish is biological activity. In other words, the more oxygen being used by aquatic plants and animals, the less DO is available for plants and animals to breathe. In the daytime, there is usually enough oxygen being produced by aquatic plants to support the life in a pond or lake. However, at night, when photosynthesis by plants stops, oxygen can be in short supply. The DO supply issue is often worsened following heavy rainfall. The rain can wash organic material (like leaves, grass clippings) into water bodies, where bacteria will decompose the organic material, adding to the oxygen demand in the pond, without adding to the oxygen supply.



Large bass can be vulnerable to low oxygen levels.
Photo credit: FWC

Decomposing organic material as well as fertilizer runoff can trigger blooms (excessive growth) of microscopic plants (phytoplankton) in the water. The phytoplankton bloom will consume large amounts of oxygen at night, and will also be short-lived, resulting in bacterial decomposition of the dead phytoplankton cells. The net result of all of this can be depleted DO levels at night.

The most common outcome of these depleted oxygen levels in stagnant water bodies is fish kills. These are typically noticed first thing in the morning (when oxygen levels are at their lowest point). The fish kill may initially only affect the largest fish in the pond, but will typically continue to affect fish over several nights. The smaller fish can sometimes get enough oxygen by staying at the very surface of the water, where some oxygen can diffuse into water from the air.

Another phenomenon that can trigger low DO and a subsequent fish kill can occur in deeper ponds (more than 5-10 feet in depth). Unless they have aeration or a pump that circulates deep water to the surface, these ponds will have a layer of very low DO water at the bottom of the pond. Occasionally, a front moving through the area can cause the pond to invert—the bottom water and the surface water will become flipped. Fish in the pond will find themselves suddenly in water that contains very little oxygen. This can also result in a catastrophic loss of fish.

The best way to prevent low oxygen levels and fish kills is to install aeration in a pond. However, this can be an expensive and logistically difficult solution (pumps require an electrical source, for example). Another recommendation for pond owners is to try and reduce the nutrient loading to the pond. UF/IFAS Extension recommends leaving at least a 10-foot buffer around water bodies. This buffer area should not be mowed, and fertilizer should not be applied within it. Plants around the edges of the pond will help absorb nutrients that may be flowing towards the water, and can physically filter out organic material like leaves. For more information about landscaping practices that protect water bodies, see <http://fyn.ifas.ufl.edu/ffl/protecting-waterfront.html>.

Rip currents

On average, more people die in the United States every year from rip currents (more than 100 fatalities per year according to the US Lifesaving Association) than from shark attacks (< 1 per year according to the International Shark Attack File). Rip currents are strong narrow currents moving away from shore. The strongest rip currents can attain speeds reaching 8 feet per second; this is faster than an Olympic swimmer can sprint! Rip currents form when waves break near the shoreline, piling up water between the breaking waves and the beach. One of the ways this water returns to sea is by forming a rip current, a narrow stream of water moving swiftly away from shore, often perpendicular to the shoreline. Rip currents are present on many beaches every day of the year, but they are usually too slow to be dangerous to beachgoers. However, under certain wave, tide, and beach shape conditions they can increase to dangerous speeds. The strength and speed of a rip current will likely increase as wave height and wave period (the time interval between waves) increase. Rip currents most typically form at low spots or breaks in sandbars, and also near structures such as groins, jetties and piers. Signs that a rip current is present are very subtle and difficult for the average beachgoer to identify.

Rip currents are not “undertow” or “riptides.” These are obsolete terms. In some areas, people have used the term undertow to describe the combination of being knocked down, pulled out, and submerged due to a lack of swimming ability and/or lack of knowing what to do to escape. This is where the myth formed that a rip current (or “undertow”) pulls you under water. A rip current pulls you out, not under. Drowning deaths occur when people pulled offshore are unable to keep themselves afloat and swim to shore. This may be due to any combination of fear, panic, exhaustion, or lack of swimming skills. Rip currents are the greatest surf zone hazard to all beachgoers. They can sweep even the strongest swimmer out to sea. Rip currents are particularly dangerous for weak and non-swimmers.

Avoid rip current problems by following these suggestions:

- Learn to swim. If you'll be in surf, learn to swim in surf. It's not the same as a pool or lake.
- Never swim alone.
- Swim near a lifeguard.
- Look for posted signs and warning flags, which may indicate higher than usual hazards. Yellow or red flags flying at the beach indicate the risk of minor or major currents respectively.
- Be cautious. Always assume rip currents are present even if you don't see them.
- If in doubt, don't go out!

If caught in a rip current:

- Try to remain calm to conserve energy.
- Don't fight the current.
- Swim across the current in a direction following the shoreline.
When out of the current, swim and angle away from the current and towards shore.
- If you can't escape this, try to float, or calmly tread water. Rip current strength eventually subsides offshore. When it does, swim toward shore.
- If at any time you feel you will be unable to reach shore, draw attention to yourself: face the shore, wave your arms, and yell for help.

You can help someone caught in a rip current by:

- If you see someone in trouble, get help from a lifeguard.
- If no lifeguard is available, have someone call 9-1-1.
- Throw the rip current victim something that floats – a lifejacket, a cooler, a ball.
- Yell instructions on how to escape.
- Many have died trying to help others. Don't become a victim while trying to help someone else!

More information about rip currents can be found at:
www.ripcurrents.noaa.gov
www.usla.org/ripcurrents
www.weather.gov/nwr/

We're now on Facebook—check out [facebook.com/NEFLSeaGrant](https://www.facebook.com/NEFLSeaGrant) and “like” it to keep informed about coastal topics in the region. Don't have a Facebook account? That's OK—you can view the page without one :)

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More “Mark your calendars”

- August 27—9:30 am—noon. Living with Mangroves workshop, GTMNERR Marineland office. Learn about the regulations governing mangrove trimming and how and when mangroves can be legally trimmed. To RSVP, or for more information, see <http://mangroveregulations.eventbrite.com>
- Sept 27—9am—4pm. National Estuaries Day, GTMNERR (Ponte Vedra Beach). For more information, see <http://www.gtmnerr.org/NED2014.php>
- Oct 10-18—Florida Master Naturalist Class (Conservation Science special topic). Brevard County. For more information or to register, see www.masternaturalist.com
- Oct 10-Nov 14—Florida Master Naturalist Class (Coastal Module). Volusia County. For more information or to register, see www.masternaturalist.com

Please check the calendar at <http://calendar.ifas.ufl.edu> for other environmental education programs around the state.

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The Foundation for The Gator Nation

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