

May/June 2013



# Environmental Update



## Diana M.C. Rashash

Diana MC Rashash, PhD  
Area Specialized Agent,  
Natural Resources  
diana\_rashash@ncsu.edu

NCCE-Brunswick Co.  
25 Referendum Dr.,  
Bldg. N  
PO Box 109  
Bolivia, NC 28422  
(910) 253-2610

<http://brunswick.ces.ncsu.edu>

NCCE-Onslow Co.  
4024 Richlands Hwy.  
Jacksonville, NC 28540  
(910) 455-5873  
(910) 455-0977 Fax

<http://onslow.ces.ncsu.edu>

And the rest of the  
Southeast District:

<http://southeast.ces.ncsu.edu/>

*North Carolina State University and North Carolina A&T State University commit themselves to positive action to secure equal opportunity regardless of race, color, creed, national origin, religion, sex, age, veteran status or disability. In addition, the two Universities welcome all persons without regard to sexual orientation. North Carolina State University, North Carolina A&T State University, U.S. Department of Agriculture, and local governments cooperating.*

## Science Hobbyists Wanted...

North Carolina State University (NC SU) is conducting a survey to investigate the characteristics and educational experiences of people active in science hobbies. The National Science Foundation (NSF) is the sponsor. It is hoped that information gained from the study will help science educators and researchers better understand how to teach science at schools, museums, and other venues; and how to design better community-based science programs.

Participation is voluntary and anonymous. Contact Dr. Gail Jones, at (919) 515-4053, if you have any questions about the study or the procedures. The survey is available online at:

<http://tinyurl.com/NCSUhobbysurvey>

## Pond Oxygen Issues...

The first large fish kill in a pond was reported in Onslow last week. Unfortunately, it will likely not be the last. This is the time of year when calls begin. There are two main reasons for fish kills of healthy fish, and both result in low dissolved oxygen (DO) levels:

- **Algal bloom:** If the water is pea soup green, there is an over-abundance of algae present. During the day, they produce oxygen; however, they utilize oxygen at night. By the early morning hours, the DO can be low enough to kill the fish. This can only be confirmed by checking the DO concentration in the water before the sun comes up. Once the sun rises, the algae start to produce oxygen again and the DO will increase.
- **Pond turnover:** When the temperature profile in the pond is the same from top to bottom, the pond water can "turn over" or mix. This allows low-oxygen water from the bottom to come to the surface. Turnover typically occurs when ponds begin to warm in the spring, cool in the fall, or have a strong wind/cold rain event.

Pond aeration is the best way to solve or prevent low DO conditions. Diffuser systems and fountains are two methods to add oxygen to a pond. The size of the system depends on pond depth, shape, and surface area. It is best to discuss sizing with the equipment manufacturer or installer.

## Shade: It does make a difference!

You've probably heard it quite often:

- Shade will make your home cooler.
- Shade will make your air conditioner work more easily.
- It's cooler in the shade.
- Shade is good.
- Shade, shade, shade!

You've probably believed some of it. Sure, it's cooler in the shade. After all, that's why we stand under a tree when it's hot outside. But how much have you believed the other claims? In other words, how much difference does shade really make?

At the 2007 Earth Day event in Wilmington, a quiet experiment was being conducted. It wasn't anything fancy; just four half-pint bottles of water on a table: two clear, two spray-painted black. They were divided into two sets with one clear bottle and one black bottle per set. One set was in the shade; the other was in the sun. The two sets of bottles were on the same table and only about a foot apart from each other, but it turns out that that can be a very big difference.

Aquarium thermometers were attached to the outside of each bottle and the temperatures were recorded periodically from 11:25 am until 5:15 pm. The resulting data are presented in the accompanying graph.

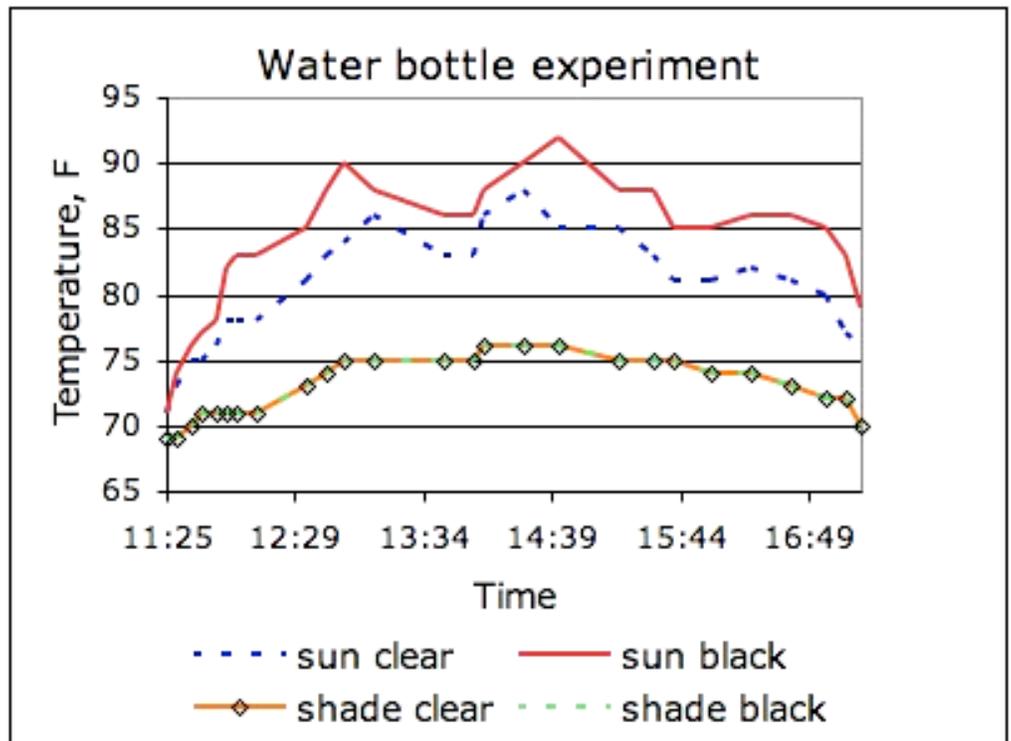
For the bottles in the shade, it didn't matter if the bottle was clear or black. They changed temperature at the

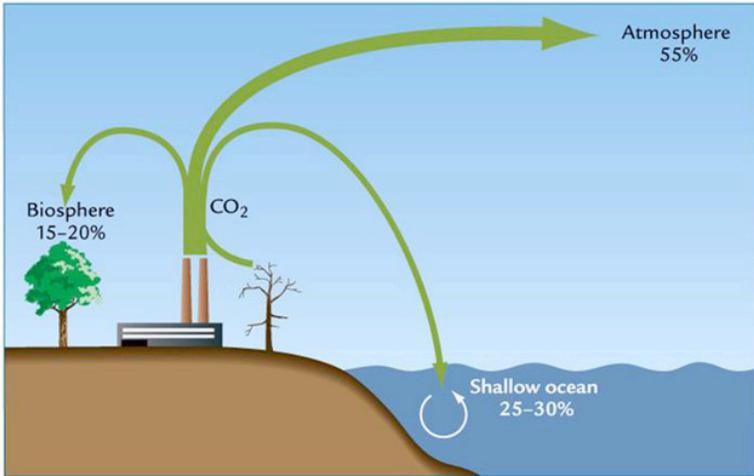
same rate and only by 7°F during the course of the experiment. The bottles in the sun were much different from those in the shade and from each other. The clear bottle reached a maximum temperature of 88°F, whereas the black bottle reached 92°F. Both bottles in the sun had a temperature drop when the sun went behind a cloud.

Curious? Try it yourself and see! And yes, a 15°F temperature difference will have an impact on: how hard your heat pump has to work, the temperature of the air that it is working with, the temperature of your yard, the amount of watering you may need to do in your yard, the temperature of rain runoff water entering local waterways (hot water can't hold as much oxygen as cold water), and on your electric bill.

An interesting website for obtaining information about the benefit of trees (energy, stormwater, etc.) is i-tree ([www.itreetools.org/design.php](http://www.itreetools.org/design.php)). At this site, you can select the tree type, its size, and even its location on your property!

Contact your local NC Cooperative Extension office for assistance and information about trees that do well in this area. Shade: it does make a difference!



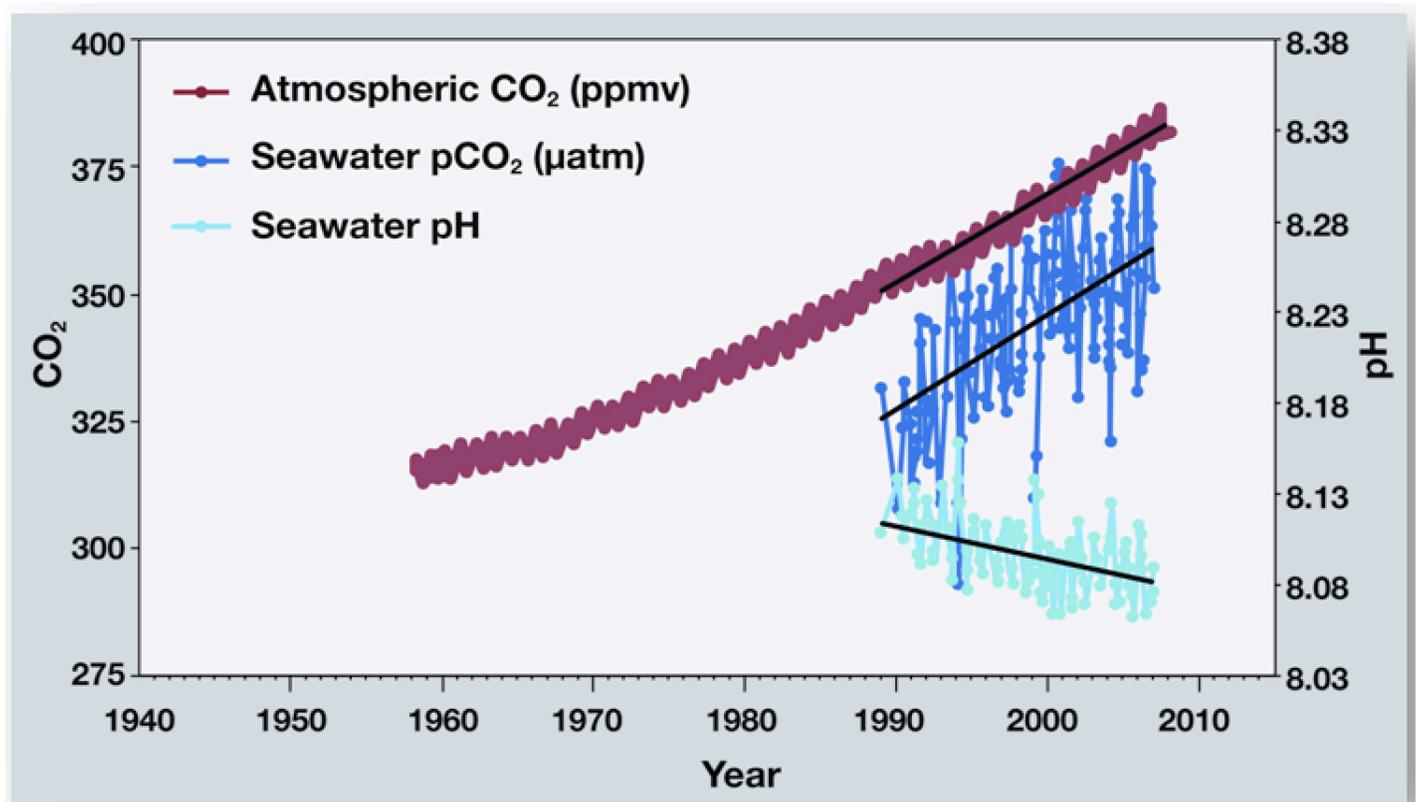


### Ocean Acidification: What is it?

Ocean acidification relates back to changes in carbon dioxide (CO<sub>2</sub>) in our atmosphere and oceans. During the past century, there has been a significant increase in atmospheric CO<sub>2</sub>. It was then noticed that seawater concentrations of CO<sub>2</sub> were also increasing. At first, that was thought to be a good thing. After all, if the oceans were a sink for the CO<sub>2</sub>, then that would help safely reduce the amount in our atmosphere. Right? Wrong!

(Source: [http://www2.sunysuffolk.edu/mandias/global\\_warming/impact\\_ocean\\_acidification.html](http://www2.sunysuffolk.edu/mandias/global_warming/impact_ocean_acidification.html))

It turns out that the CO<sub>2</sub> reacts with the water to form carbonic acid. The result is that the ocean is becoming more acidic. It also participates in other reactions that compete with shell-forming organisms, thereby reducing their ability to make shells. The following graphs show the changes in CO<sub>2</sub> concentrations and pH from monitoring in the North Pacific Ocean.



(Source: Data from R.A. Feely, Pacific Marine Environmental Laboratory, National Oceanic and Atmospheric Administration, USA, with atmospheric data from Pieter Tans and seawater data from David Karl. Adapted from Feely (2008) in Levinson and Lawrimore (eds), Bull. Am. Meteorol. Soc, 89(7): S58.)

The National Oceanic and Atmospheric Administration (NOAA) has an ocean acidification monitoring program. Two early warning sites are located in North Carolina, as may be seen in the map below. More information is available from the NOAA website:

<http://www.oceanacidification.noaa.gov/>



**Don't forget ...**

Help save paper, postage, and your tax dollars! This newsletter and the annual reader survey are available online at:  
<http://onslow.ces.ncsu.edu/content/Envedarchive>

North Carolina Cooperative Extension Service  
 North Carolina State University  
 Onslow County Center  
 4024 Richlands Hwy.  
 Jacksonville, NC 28540



**4-H Summer  
 Avenues of Interest  
 2013**

The 4-H motto is “To Make the Best Better”; so make the best better by enrolling now to learn something new and meet new people. The 4-H office along with those giving leadership to the activities hope you have an enjoyable summer, and invite youth age 5 - 19 to take advantage of the many opportunities offered in the Avenues of Interest Summer Program.

We invite you to join us for an exciting summer!!! Any youth in Onslow County may enroll in one or more workshops, you do not have to be a 4-H'er to register, just come by the 4-H office at 4024 Richlands Highway, Jacksonville. Call us at 455-5873 or you can also check our web site to see what classes we offer and if they are full.  
<http://onslow.ces.ncsu.edu> All programs have a registration fee, which must be paid when you register. Registration will not be held at the workshop or activity.

All monies collected are used for supplies and or instructor fees. Again, do not miss out on an exciting summer of 4-H activities.