

## **No Time to Waste**

Extracted from an article in WATER EFFICIENCY by Benjamin H. Grumbles  
Assistant Administrator of water for the US EPA

According to the National Climatic Data Center, 38% of the United States was in a “moderate to extreme drought” at the end of November 2007. Those record-breaking conditions brought water conservation back into the social consciousness for many communities. The fact is that by 2013, water shortages are anticipated in at least 36 states – even in non-drought conditions. Population growth, aging infrastructure, and the unpredictable effects of climate change are stressing water supplies throughout the country. Water conservation is not a passing fad or a subject to be discussed only during a “dry year”. More water professionals and citizens are realizing that increasing efficiency is the most cost-effective and environmentally sound way to reduce the demands on our water resources.

Most utility conservation programs rely heavily on public education to change behavior and reduce water demand. EPA created the WaterSense program ([www.epa.gov/watersense](http://www.epa.gov/watersense)) in June 2006, knowing markets can be transformed; indeed, the world can be changed when informed consumers connect with efficient, high-performing products and services.

If just one in every 10 American homes replaced old fixtures with WaterSense-labeled toilets and bathroom faucets, the country would save more than 120 billion gallons annually and about \$785 million in energy costs required to pump, treat and heat the water every year!

## LAKE KEOWEE DRAWDOWN SCHEDULED FOR 4<sup>TH</sup> QUARTER 2008

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Duke Energy operates Lakes Keowee and Jocassee to meet customer demand for electricity, provide important fish and wildlife habitat, public recreation opportunities and provide for municipal and business water needs.

Maintaining adequate water levels and a reliable source of water play an important role in the safe operation and maintenance of Oconee Nuclear Station.

As part of a comprehensive preventive maintenance program at Oconee, Duke Energy will lower Lake Keowee to approximately 7.5 feet below full pond (792.5' above mean sea level) beginning the week of October 20, 2008, temporarily storing the water in Jocassee.

This lower lake level is necessary to safely conduct maintenance work on the water intake piping at the nuclear plant. This detailed work is currently scheduled to last through mid-December. Once the work is complete, the lake level will be raised to approximately 5 to 6 feet below full pond. Actual levels will be contingent upon the drought impact.

This specific work on the intake piping can only be performed when a nuclear unit is not operating. To maximize power generation, we conduct this work when a unit is already scheduled to be shut down for refueling and maintenance work.

The drawdown of Lake Keowee for intake piping work is not performed yearly. However, this important maintenance work cannot be completed all in one year. The work must be done during each unit's refueling and maintenance outage in the fall. Work on unit 1 was performed in 2006, unit 3 in 2007, and unit 2's work is scheduled for 2008.

Duke Energy recognizes the inconvenience to lake users of lowering the lake level, and we appreciate your understanding.

We are making notifications now about this work to give sufficient notice to property owners. Anyone interested in doing work inside the lake boundary such as installing or modifying docks or conducting shoreline stabilization or excavation must contact Duke Energy Lake Services at 1-800-443-5193 to obtain required approvals and permits.

Balancing the multiple uses of Lakes Keowee and Jocassee is a challenging task that Duke Energy takes seriously. We work diligently with the various water users and stakeholders to help maintain an overall balance for the different and often competing water uses.

Oconee Nuclear Station is committed to the continued safe operation of the station. We will continue to perform our rigorous preventative maintenance which periodically may require lowering the lake level.

For the latest updates, please call Duke Energy's Lake Neighbor Information line at 1-800-829-LAKE (5253) or check the lake summary information page on [www.duke-energy.com/lakes/levels.asp](http://www.duke-energy.com/lakes/levels.asp). You may also call the World of Energy at 1-800-777-1004.

## President's Corner

By Bill Graham

Echoing my column in the July August Sentinel, the drought continues unabated in our corner of the state. That is why the entire front page is dedicated to water. The State Drought Response Committee met in Greenville recently and their only action was to remove several counties from the list of severe drought status. Our well-attended August 21<sup>st</sup> Forum featured Mr. George Galleher – Manager of Duke-Energy Hydroelectric Operations. George presented a comprehensive picture of the various forecasts and historical hydrological data that are reviewed weekly. Various forecasts show a higher probability of above average rainfall during the “tropical storm” season but, although we just went through a period of above average tropical storm activity, the Upstate received very little rain from them. A second critical factor is that fall is just around the corner and that period is typically one of low rainfall. The “takeaway” summary was:

- We are in a persistent drought that shows no clear signal of ending anytime soon.
- The useable storage in Lake Jocassee continues to decline.
- It takes everyone conserving to stretch those limited water resources.

There are things that everyone one of us can do to help “stretch those limited water resources” and if you go to <http://www.keoweefolks.org/news/drought/water-efficiency.htm> you will see many of them – ranging from taking shorter showers to considering installing newer water efficient bathroom and kitchen fixtures. We must develop a new mindset; one that places water conservation front and center all the time.

Another subject that is critical to the well-being of the lake is the Oconee County Council consideration of Zoning. After much discussion and many public meetings, the Oconee County Council recently retained a planning consultant who is experienced in the issues of implementing zoning in rural counties in North and South Carolina. At a recent Council meeting the consultant presented recommendations on how to proceed and based on work done by the Planning Commission and the County Council, a draft Zoning Enabling Ordinance has been developed. It is available at: [http://www.oconeesc.com:80/council/Pending\\_Ordinances.html](http://www.oconeesc.com:80/council/Pending_Ordinances.html).

This ordinance provides several options for initiating zoning, including a citizen based initiative based on 15% of the property owners in a Fire District petitioning the council. While FOLKS has favored 15% of the registered voters, the Planning Commission and County Council have favored using property owners. A previous draft of a ZOE contained a requirement of 30% of property owners, a hurdle which we felt was too high for such a petition. We were pleased to see the level lowered to 15%, which is also in line with the consultant’s recommendation.

Zoning is an extremely important and emotional issue but we believe that it is long overdue both for the sake of protecting our valuable natural resources as well as providing for much needed economic development. We congratulate and thank County Council President George Blanchard for continuing to champion this issue. The next 6-8 weeks are the time for all of those in favor of the ZEO to make your position known by attending County Council Meetings and expressing your support.

The FOLKS LID project is really starting to take shape. If you have driven by you were looking at a parking lot made of pervious concrete. When it rains, the stormwater drains down to a layer of crushed stone which has imbedded in it, a drain collection system that brings water down slope to two underground 1000 gallon septic tanks. A demonstration piece of pervious concrete is shown here. The water collected in this “cistern” will be used to drip irrigate some of the plantings yet to be done in the back yard. We still have three more phases to complete: The construction of a 10x20 green-roofed

storage shed which will be constructed by the second year carpentry class at the Hamilton Career Center; a bioretention cell downslope of the parking lot; and additional plantings in the backyard.

Finally, we note the choice of Ken Sloan to be Executive Director of the newly formed Oconee County Convention and Visitors Bureau and look forward to working with him and his counterpart in Pickens County with our objective being to provide input on side of passive recreation and the necessity of protecting our most valuable visitor asset – our Upstate Lakes.



## Upstate Forever Launches Interactive LID Mapping System

Lisa Scott Hallo | Urban Rivers Project Associate  
Upstate Forever

**Upstate Forever's** Clean Air and Water Program (CAW) strives to encourage Low Impact Development (LID) in the Upstate. LID is an alternative approach to stormwater management that focuses on practices such as bio-retention systems, rain gardens, and pervious pavement. The benefits of LID design include increased water quality, improved aesthetics, and, in many cases, lower costs for developers.

To educate developers, builders, local officials, and the general public on LID projects already implemented in our local area, the CAW Program is proud to announce the launch of our new online interactive LID mapping system. This site, located at [www.imrivers.com/upstateforever](http://www.imrivers.com/upstateforever) showcases demonstration sites around the Upstate that provide real examples of how stormwater can be successfully managed. In the future, we hope to expand the map site to include data from community-driven stream advocacy groups, pollution problem sites, stream access points, and other environmental points of interest.

If you have any questions about the mapping system, please contact Lisa Hallo at [lhhallo@upstateforever.org](mailto:lhhallo@upstateforever.org). If you would like to nominate a project to be represented on the interactive LID mapping system, please submit a Project Nomination Form to [lhhallo@upstateforever.org](mailto:lhhallo@upstateforever.org). The form can be accessed online at [upstateforever.org/index\\_doc/0808LIDProjectNominationForm.pdf](http://upstateforever.org/index_doc/0808LIDProjectNominationForm.pdf).

## **Ken Sloan Selected to be Executive Director Oconee County Convention and Visitors Bureau**

Ken Sloan has been selected to fill the new position of Executive Director of the Oconee County Convention and Visitors Bureau (CVB). Sloan has been the owner of the Jocassee Outdoor Center since 2003 and the creator/owner of the Carolina Boat Club since 2005. In these roles, he has developed excellent experience attracting tourists to this area and he has developed many contacts with tourism professionals throughout South Carolina.

In addition to his tourism experience, Sloan has over 25 years of corporate technology experience. Fifteen of those years have been senior management experiences where he has provided innovative leadership in client management, project management, contract development, sales, and cost analysis. According to Alan Blackmon, Chairman of the Oconee Alliance, "These experiences should serve Mr. Sloan well as he leads this CVB start-up."

During the interviewing process, the search committee learned that Sloan has been very active in tourism initiatives. He has partnered with members of the staff of the South Carolina Parks, Recreation, and Tourism Department to reopen a pavilion at Devils Fork State Park. While expanding his businesses, he has developed strategic partnerships with local recreation and tourism businesses. Mr. Sloan served on the Greenville CVB Steering Committee that assisted with the development of their recently announced "Go Experience." He also served on the steering committee for the development of the website for Discover Upcountry. In addition, he has developed websites for his businesses. Finally, Mr. Sloan has established contacts with the leadership of the Heritage Corridor and has been serving as Chairman of the Oconee County Tourism Committee.

Mr. Sloan's ancestors moved into this area in the mid-1700s. Born in Houston, Texas, Sloan moved to Greer in 1985. Prior to that move, he had spent the summers on his grandparents' farm in Spartanburg County. It was during those summers that he developed a love for all the outdoor beauty and experiences that this area has to offer. He says that his passion for the area and tourism in general has grown over many years.

After the Oconee County Council voted to fund the CVB for three years, the search for a CVB Director went nationwide. Jim Gadd, Executive Director of the Oconee Alliance, said, "The search committee has always hoped that a local candidate with excellent credentials would emerge." Gadd further stated that the Selection Committee voted unanimously to offer the job to Sloan. Mr. Sloan accepted the Oconee Alliance offer and will report to work on September 8, 2008.

Photo accompanies article

## Comments on Limnology Article

By Ben Turetzky

A FOLKS member called the office to report a brown floating mass in his cove that he had sampled. We picked up the sample, took additional samples and took some photos – close up of sample and mass in water are shown. The sample did not have any obnoxious odor (as in fecal matter). In my simple words after reading Dr. Hains article and doing a little Googling, “dinoflagellates” have been found as fossils going back to the Jurassic Period. They are found in both salt and fresh water. They are at the base of the marine food chain and are therefore very important. When hydrological conditions are right (as in this time of the year), they multiply rapidly and as they age and die, they rise to the surface forming light brown foams (which we have also seen on the lake) and, given the right combination of winds and thermal currents, they can grow into large clumps as in the photos. This phenomenon of rapid population growth is called a “bloom”.



## **Duke Energy Recreation Use & Needs Study (RUNS) & Recreation Management Plan (RMP)**

By Ben Turetzky

In the July-August Sentinel we presented an overview of the RUNS and introduced the next step in the process which is the development of a Recreation Management Plan (RMP) which will govern the management and further development of the public access areas on Lake Keowee. The RUNS indicated a strong need for items such as: courtesy piers for loading and unloading boats; picnic areas, walking trails and public restrooms.

A draft RMP has now been provided to the stakeholder team and comments have been returned. A summary of all comments received as well as specific descriptions of how the comments and suggestions will be accommodated in revising the first draft of the RMP. A final draft will then be provided to the stakeholders and the RMP will be finalized and submitted to the Federal Energy Regulatory Commission (FERC) for approval. Duke-Energy will conduct a public forum at the World of Energy following their submittal to the FERC.

Going back to the RUNS, there was a very important element of the study which dealt with “Boat Carrying Capacity” which, in simple terms, is a measure of what the optimum average number of boats should be based on the type of boat (i.e. large high powered boats need more space than a sailboat). We will post a more detailed explanation developed by the Corps of Engineers of how “Boat Carrying Capacity” is determined on our website.

There are some very interesting graphical depictions of boat loading in the upper and lower parts of Lake Keowee that were based on fly-over photography over a period of months including major holidays. <http://www.keoweefolks.org/news/run/keoweiboats.pdf> The photos depict increasing density by color change from blue to red, a differentiation which cannot be seen in a Sentinel photo so please go to the url above.

As you view these photos, it is obvious that Holiday weekends are very busy but you can also see that there are some “choke points” on the lake. In our comments on the RUNS and the RMP we have noted that there should be a future projection of capacity utilization performed using population growth in Pickens and Oconee Counties and the number of current and approved boat slips on the lake, especially if additional commercial marinas are approved. The highest capacity utilization was 44% on July 3<sup>rd</sup>.

## Practical Limnology: September 2008

By Dr. John Hains, Clemson University

As I write this, on this first day of fall, just after the autumnal equinox, I have been given a sample from Lake Keowee for identification and it brings back many memories related to reservoir limnology. First about the sample: it was given to me by Ben Turetzky for identification - on behalf of one of the lake residents. It consisted of a plastic potato salad container with about 300 ml of lake water containing brown settled and suspended material that had previously existed as foam on the surface. I mention this because there is nothing wrong with use of such containers, in fact I encourage such recycling rather than merely disposal in a landfill. Just make sure the container has been cleaned before adding the lake sample.

Back to the identification. I have received similar requests on different lakes at about this time of year - over the years - and this type of material has found its way to my microscope often enough that sometimes think I know ahead of time what it will be. Fortunately, this time was no exception. Before I tell you what I found I will explain what is happening to lakes now in this region.

Some of you have probably noticed the cooler evenings we've enjoyed for the last week or so. This atmospheric cooling is expected this time of year but lake temperatures do not respond as quickly. This is due to the much greater specific heat capacity of water compared to air (discussed back in one of the first installments of this series). Water temperatures will remain warmer than early morning air temperatures for quite a while yet, producing the wonderful fall conditions we love in this region. The most dangerously cold water temperatures will wait until late winter and early spring.

Because this process is slow, relative to the atmosphere, we can expect to have much cooler air in contact with relatively warm lake water. When this happens energy is transferred from the lake to the air and sky through processes of conduction, convection, and direct back radiation. If the lake surface cools to a temperature that is less than underlying waters, the resulting density instability will be corrected by convection currents IN the water. Wind only accelerates this process of mixing. The combined effects of wind and convective mixing gradually mixes the lake starting at the surface and proceeds deeper with passing days and weeks. However, in small, shallow lakes and in shallow cove areas of large lakes, this process can happen much more quickly due to the shallow depths. This process is happening in Lake Keowee just as it is in Lake Hartwell and other lakes.

If you remember from another installment of this series, that the epilimnion is located at elevations above the metalimnion and hypolimnion (these are the three layers of a thermally-stratified lake), you will understand that the gradual mixing therefore also gradually mixes through these layers. If there are layers of organisms or chemicals associated with these layers, then when the mixing process finally gets to those depths, the sudden appearance of those chemicals or organisms at the surface can be alarming if we notice them at all.

Certain organisms DO have certain thermal preferences and therefore are sometimes seen in the late summer or early fall. Cyanobacteria, for example, are well-adapted for high temperatures. And dinoflagellates also seem to prefer late summer and early fall for their maximum population densities. But the cyanobacteria are often growing in the metalimnion

while the dinoflagellates occupy the epilimnion.

For a stratified lake, there is also a chance that dissolved metals such as iron or manganese will be released from anoxic sediments. This is common for lakes in this region and it poses no great environmental or health problems of which I am aware. However, during the fall, especially where deeper water is being mixed to the surface, people often notice a change in the water color to a much darker brown or reddish color. This color is due to both the dissolved metals as well as the oxidized precipitates that form when they are exposed to oxygen during mixing. This is a temporary condition that diminishes as the winter approaches.

In Lake Keowee, both the biological and the chemical processes would be expected to some extent. And the sample delivered to my microscope is a good reminder of this. The foam that was collected is something I have observed at about this same time on Lake Keowee and other lakes in other years. The color is similar also. When I examined the sample, I found many things. There were many types of phytoplankton that had become trapped in the foam. There were pieces of dead zooplankton. There were phycomycete spores (aquatic fungi). There were some pollen grains, and some plant fragments. But more than anything else, there were dead remains of dinoflagellate cells. Because these were fragments and certainly not alive, specific identification is nearly impossible but not really needed. I can only guess that a 'bloom' of dinoflagellates had become senescent and the dead cells floated to the surface during decomposition. I can only speculate how the foam was formed although I have observed this many times in the past.

But what I do know is that this may be a normal part of the cycle of life for Lake Keowee, as well as part of that wonderful fall that we are about to enjoy. In closing, all I can say is that it is good to be observant. It is good to be vigilant for things you haven't noticed before. And it is great to have these samples arrive at my microscope. Thanks for the memories.

## Fall color in the Upstate

Lisa K. Wagner  
Director of Education  
South Carolina Botanical Garden

Hints of fall color appear in late September and early October in the Upstate, earliest in the mountains and later in the piedmont. The red of sourwoods is often the first sign of fall, but drought muted their colors last year and probably will again this year. Early leaf color in maples, though, is often triggered by drought, probably as leaves have shut down production of chlorophyll early.

Sometimes a dry summer will enhance fall leaf colors, but most important are the conditions at the time they're turning.

The basics of fall color are straightforward; as daylength shortens each day, longer nights trigger a slowdown of chlorophyll production, the light-capturing pigment that provides the overriding green color of leaves. Then, it's the interplay of daily temperatures and moisture that affects the plant pigments that determine how spectacular our fall colors are from year to year.

As the chlorophyll disappears, other pigments in the leaves, carotenoids (that produce the yellow and oranges) and anthocyanins (that produce the purple and reds), are revealed, depending on the species of tree.

Fall anthocyanins are actively produced as a reaction between sugars and proteins - in the watery vacuoles of leaf cells, and their colors are influenced by acidity. They start showing up as the chlorophyll breaks down, and corky deposits start blocking the downward flow of sugars between leaves and stems. In contrast, the carotenoid pigments, important in photosynthesis, are present throughout the growing season, but are masked by chlorophyll.

So, whether it's a particularly good year for color, or a poor one, especially for reds and purples depends on fall weather, with temperatures (day and night) and general moisture level most important.

Warm sunny days at the time chlorophyll production is declining (supporting lots of sugar production through photosynthesis) with cool crisp nights produce the best reddish and purple colors - the anthocyanin pigments - with a lack of a good cold snap often resulting in duller reds and purples. In contrast, yellows and oranges are fairly consistent from year to year, since the carotenoids are always present in the

leaves. Overly dry weather (and we've had two years of severe drought) will generally produce more brownish leaves and early leaf drop, instead of spectacular color in many species.

Different tree species have different combinations of the basic pigments, and here in Eastern North America, we have the largest diversity of trees that exhibit fall color, so many of our natives are prized in Europe for fall color - our sweetgums and tulip poplars for example.

Some of our native trees that are shades of oranges, reds, and purples include the red, white, and scarlet oaks, persimmon, sassafras, dogwood, sweetgum, as well as the maples. Hickories, river birch, redbud, tulip poplar, and sycamore turn yellow and gold. Beech leaves also accumulate tannin, adding a bronze color to the underlying yellows. These are all common eastern U.S. species that characterize our Upstate forest communities, both in the mountains and piedmont, creating ample leaf-watching opportunities throughout the region.

Last year was a nice fall color year in spite of the drought, because we had a timely cold snap followed by warm, sunny days.

This fall could be excellent, sub-par, or normal - no two falls are alike!

# Membership Update & Donations & Endowment Contributors

By Jim Hamilton, Membership Chairman

Welcome and thank you to the new members and those who have renewed at a higher membership level since the July-August 2008 Sentinel, through September 15, 2008. **If you would like to help increase our membership in your community by becoming a Community Contact, please call Maryjo at the office to find out how easy it is.**

We thank the **Cliffs Communities** for their first year dues sponsorship of new Cliffs Communities' owners and also thank **1<sup>st</sup> Choice Realty** for their novel sponsorship program where they sponsor clients and direct that the first year dues be apportioned 50/50 between the endowment and operating funds.

## **New Members:**

Nancy & Richard Allan, Marilyn & Jack Allen, Bonnie & John Bachman, Ginny & Jim Bench, Charlotte Benford, Anne & Jim Brooks, Linda & Rodger Chapman, Carole & Jim DeBisschop, Christine & William Dickson, Linda & Russ Duryea, Gloria & Fred Geiseking, Catherine & Carl Holversen, Sue & John Harris, Nancy & Gregory Henning, Adelaide & John Howell, Cynthia & Stephen Humphrey, Elaine & Terry Keane, Marray Lee, Tim Lewis, Joan Lodes, Ellen & Allen Long, Sandy & Tim McKinney, Barbara & Doug Menne, Grace Michaels, Shizuka Miyano, Joyce & Chuck Polosky, MaryJane & Paul Power, Randy Renz, Eileen & Tom Ronan, Robert Schmeelcke, Carol & Sheldon Singer, Ann & Bud Smith, Susan & Steven Solomon, Monica & Peter Sprague, Susan & Ralph Steffan, Janelle & John Stone, Linda & Derrick Van Wyk, Carol & Charles Vanover, Genevieve & Charles Walsh, Brigitte & Hellmut Walter, Barbara & Herbert Webb, Beth & Bob Wilkinson, Wilma & Irv Winik, Andrew Wintercorn.

## **New Members Sponsored by 1<sup>st</sup> Choice Realty:**

Judy & Edward Beckett, Nancy & Ray Carrington, Ellen Clark, Aidil & Robert Emmons, Dianne & James Henderson, Andrea & Tim Howard, Mary Magnus, Lynn & Terry McGuire, Rite & Michael Savoia, Paul Smith, Dianne and Anthony Sosnowski, Sarah Tull, Tom Villiger

## **New Members Sponsored by The Cliffs Communities:**

Ronald Goldberg

## **New & Renewing Patron Level Members:**

Bess & Jack Ciupak, Linda & Russ Duryea, Marilyn & Dean Hudson, Karen & John Humeniuk, Barbara & Ron Laughter, Sandy & Tim McKinney, Bill Milstead, Kathy & Mike Panther, Cheryl & Larry Pollard, Randy Renz, Ann & Bud Smith, Susan & David Spence, Alden Valentine, Beth & Bob Wilkinson

## **Memorial Donations:**

Reggie & Ben Turetzky in memory of Bunny Ebeling; in memory of Jean Chase; in memory of Jerry Lynch

**When you renew please consider stepping up to the next level: Patron - \$100 Sponsor - \$250**

Here is a way to make your dues and or contributions to the endowment fund multiply.

Among the list of companies that have matched FOLKS' members contributions are: Pfizer Dominion Foundation, IBM, BellSouth, and Robert Wood Johnson Foundation. However, many companies encourage their employees to participate in a matching gift program. Through such programs, any donation made by an employee (or retiree in many cases) is matched by the company. The programs vary from company to company so check the link below to see if your company is included. If so, please contact the HR Department to get the details and any necessary forms:

<http://www.pacn.org/corpmatchinglist.htm>