

*Southeastern Water Pollution Biologists
Association
2007 Annual Meeting
Folly Beach, SC
Nov 5-8
Newsletter #1*



President's Letter

Hello SWPBA friends and colleagues! I hope you are all enjoying the warm spring weather. Things are really starting to pick up and come together for our meeting. I am excited to have heard from many sponsors and vendors that are eager to come back and participate after having a good time at previous SWPBA meetings.

I hope we hear from some of you soon in regards to nominations for the Biologist of the Year Award and the Lifetime Achievement Award. I know there are many worthy and well deserving Region 4 colleagues, so get those nominations in. You will see the requirements listed later in the newsletter. Also it's not too early to think about presentations and talks. We would love to have a variety of interesting topics, so send in your abstract or let us know of a topic you want to hear about and we'll certainly find a place for it.

We are hoping to have our banquet this year at a restaurant in downtown Charleston near the historic market. We are going to try to arrange transportation so that we don't all have to follow each other and worry about parking...or have too much of a good time and worry about driving back! We anticipate ending our talks early that afternoon so we can get to downtown and walk around or take advantage of our scheduled field trip before dinner. We have arranged a group tour of the Charleston harbor by boat! The **"Harbor of History"** tour is a live narrated tour by the Captain and includes 75 historical and contemporary points of interest. We have obtained a special group rate of \$12.60 per person. Look for that information in future emails or the next newsletter as well as banquet information. Registration information will be sent out soon, too, so be on the look out!

I want to thank Emily Cotton again for willing to serve as secretary. She's doing an amazing job even though we are three states apart! We have kept each other informed through e-mail and phone calls, and I believe things are going to come together for a fantastic meeting. I also want to thank those here in South Carolina who have volunteered their help as well as those willing to serve on the executive committee.

Until our next newsletter,
Ann-Marie

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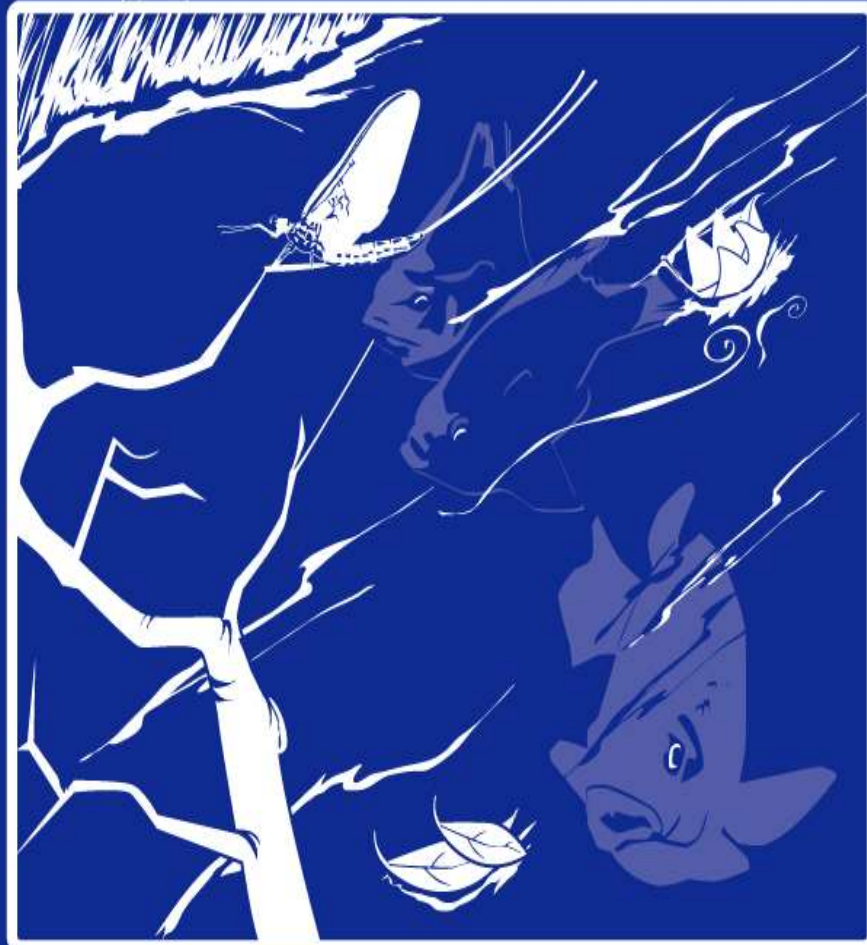
T-SHIRT DESIGN

The following is the design for this year's t-shirt. The shirts will be navy blue with white writing and you'll have the opportunity to order short sleeved or long sleeved. Look for ordering information with the registration form in forthcoming emails.

Front of t-shirt/ chest:



Back of T-shirt (will be navy just as front)



Biological diversity is the key to the maintenance of the world as we know it.

- E.O. Wilson

Next up: State Updates

News from



DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

The Aquatic Biology Section

The Environmental Quality Control (EQC) branch of SCDHEC has had a large number of staff who's retirement occurred in a small window of time over the last 2 years resulting in a great deal of change for our Agency. I suppose you could say it was a synchronous immergence of a single cohort. David Wilson became the Bureau of Water's Chief, David Baize is now our Assistant Bureau Chief, and Chuck Gorman is the new Division Director for the Division of Monitoring, Assessment, and Protection. Alas the Aquatic Biology Section was not spared with Butch Younginer retiring at the end of last year. Butch is still with the Agency part time and continues to play a role in the fish tissue advisory for SC. I applied for and was offered the Section Manager position in March and am excited about the possibilities that lay in front of our group. As I write this the posting for my vacated position as a macroinvertebrate taxonomist has recently gone up on the SCDHEC website and will be open for applications until 14 May 2007.

As a State and Section there are a lot of happenings coming in the near future. Of course the North American Benthological Society is coming to Columbia in June and we hope to see many of our SWPBA friends in attendance. Later in the year the SWPBA meeting will be returning to the Palmetto State this time on our beautiful coast.

As our Section and Agency continues the transition into the new millennium we look forward to working with our colleagues in other southeastern state agencies as well as EPA Region IV.

-Jim Glover, Ph.D. Manager, Aquatic Biology Section

Phycology Program

We in the Phycology Department in South Carolina would like to thank our Georgia colleagues for hosting the 2006 SWPBA meeting. The presentations were very interesting and informative and the arrangements were excellent at the Lake Blackshear Resort. As always, it was a real pleasure to see all our Region 4 friends and to have the opportunity to “talk shop” and socialize.

We are in the midst of trying to catch up on some phytoplankton analyses for samples collected from the ambient monitoring network. Summary reports for chlorophyll analyses, the *Pfiesteria*/HAB Monitoring and Surveillance Program, the Ambient Monitoring Program, and the Fish Kill/ Algal bloom Investigation Program are in various stages of completion.

For whatever reason, the number of reported fish kills from last year with phytoplankton samples submitted was somewhat lower. We had about 10 incidents where fish kills were investigated with phytoplankton sampling deemed necessary.

The 2006 chlorophyll samples have been finished and the data tabulated. Many thanks are due to Sharon Hobart in the Aquatic Biology Section for her diligent work in this program area the past two seasons. We could not have maintained the expanded level of our chlorophyll program without Sharon’s efforts.

For the 2006 season, 113 stations were collected once per month May-October for chlorophyll with an additional 50 stations in estuaries collected once. The breakdown on the (113) station types included 93 lakes sites and 30 estuarine sites. From 1999-2006, over 450 locations were sampled in estuaries using a probability-based, random sampling design. Thus far, we have been mapping chlorophyll in our estuaries with data collected from 1999-2005. The 2006 data will be added to the series of GIS-based maps depicting estuarine chlorophyll concentrations.

There is a strong push here at SCDHEC to finalize numeric nutrient criteria for estuaries. For those of you working on the nutrient criteria issue, you will remember that EPA has suggested states look at eutrophication “causal” factors as well as “response” factors in developing nutrient criteria. A substantial amount of data for nutrients (causal factors) and chlorophyll (response) is now available for this purpose since the 450 plus estuarine stations were sampled for these parameters and others.

Jake Bickley from our Phycology Department is planning to attend the annual meeting of the North American Benthological Society to be held in Columbia June 3-7. We hope to see many of you there.

This past summer and early fall we participated in the Southeastern Plains In-Stream Nutrient and Biological Response (SPINBR) study. Sampling benthic algae (periphyton) in streams was new for us since our phycology program has concentrated on phytoplankton for a number of years. It was very interesting to explore the variety of algal habitats found in the stream environment. After having attended Region 4 periphyton workshops in 2005 and 2006 and conducted field sampling this past year, we believe we have a solid base of knowledge for developing a periphyton sampling program. We intend to participate in the on-going SPINBR program again this year.

That's all for now folks. Hope everyone has a successful and safe year. See you in South Carolina for SWPBA!

News from North Carolina

ENVIRONMENTAL SCIENCES SECTION YEAR IN REVIEW 2006

The Environmental Sciences Section provides DWQ's Surface Water Protection Section with scientific and technical support required to regulate and manage water quality throughout North Carolina. **The four units and two teams of the Section**, comprised of biologists, environmental specialists, and technical support staff, evaluate the state's aquatic resources through a variety of specialized biological, chemical, and physical techniques. These evaluations provide the basis for sound scientific decisions.

The following includes a brief summary from each of the units and the teams on past and ongoing activities. As with any summary, it falls short of describing the significant levels of communication in which many individuals of the Section are frequently involved to ensure best use of our information to meet the needs of the Division, the Department, EPA, and the citizens of North Carolina in our overall mission of protecting and improving water quality.

BIOLOGICAL ASSESSMENT UNIT

Stream Fish Community Assessment Program

During 2006, the stream fish community assessment program sampled 113 sites, stretching from Cherokee County in the extreme southwest corner of the state to Scotland County in the Sand Hills to Surry County in the Northern Piedmont. Use Attainability Studies, reclassifying streams for more stringent water quality protection, was conducted in July 2006 for two watersheds in the French Broad River Basin and a fact sheet on the methods for reclassifying a stream segment to trout waters was developed. Stressor studies were conducted in a Yadkin River basin watershed and in a Catawba River basin watershed.

EEP studies also included six sites in Tar subbasin 01. These samples showed very few water quality issues. Although there was no fish site located just below the Oxford WWTP, the Fishing Creek site located just above the outfall (above SR 1607) did show signs of water quality stressors, which are likely due to urban

runoff from the town of Oxford. This was the only fish community site that received a bioclassification of Good-Fair, the lowest NCIBI rating in the study. Three of the six fish sites were rated Good (UT Coon, Coon, and Shelton Creeks). NCIBI scores and bioclassifications for the previously sampled sites on Coon and Shelton Creeks dropped, perhaps because of natural variations in the fish communities. The other two sites (Fishing Creek at SR 1643, and Gibbs Creek) were rated Excellent.

An EEP study in the Hiwassee River subbasin 02 included four fish community samples as part of a larger benthic study.

Collaboration with professors at North Carolina State University continues with presentations to students in Limnology and Biology of Fishes classes. External assistance/outreach programs continue with the Pigeon River Native Fish Species Reintroduction Project, Carolina Madtom Recovery Project, NCSU's Urban Fish Response Project, USGS's (Raleigh, NC) Urban Intensity and Fish Responses Project, North Carolina State Museum of Natural Sciences' revisions to the Endangered, Threatened, and Rare Fishes of North Carolina, and the Museum's and Roanoke College's study on the distribution, abundance, and life history characteristics of the undescribed Carolina Redhorse Sucker. Web pages for the fish community program were updated and are current through December 31, 2006 (NCDWQ's Fish Community Database (<http://www.esb.enr.state.nc.us/NCIBI.htm>), NCIBI Scores and Ratings (<http://www.esb.enr.state.nc.us/IBIrate.htm>), and Native and Exotic Freshwater Fish in North Carolina (<http://h2o.enr.state.nc.us/esb/BAU.html>)). The Quality Assurance Program Plans (QAPP) for the stream fish community assessment program was sent to EPA Region 4 in July 2006.

The fisheries summer intern position has continued to be a success, both for the interns and BAU. Recent interns have gone on to graduate school and one has applied for a grant to help evaluate our sandhills stream fishery data to expedite development of criteria for such streams, and BAU was fortunate to hire Michelle Simonsen onto our staff.

Fish Tissue

The DWQ statewide survey for organic pollutants in fish tissue was conducted for the fourth and final year during 2006. The survey is intended to further assess the character of pesticide contamination throughout the state. The survey is intended as a Tier 1 type study whose primary goal is to identify mainstream inland waterbodies where organic contaminants exceed specified human health screening values for edible fish. Sites where contaminants are identified would require more intensive follow-up sampling. Staff members collected a top predator and bottom feeding species at sites in the Little Tennessee, French Broad, Watauga, and New basins.

DWQ continues to assist the NC Department of Health and Human Services (DHHS) and USEPA in the collection of fish samples from Crabtree Creek in Raleigh. Further sampling was requested to augment studies performed by EPA and to further delineate current PCB advisories in the watershed. At present DHHS has posted an advisory for Brier Creek, Little Brier Creek, Lake Crabtree, and Crabtree Creek, from Lake Crabtree to where it enters the Neuse River.

Fish Kills

Field investigators reported 25 fish kill events from January to December, 2006. Kill events were reported from coastal waters westward to the Piedmont as far as Burke County. Kill activity was documented during the year in 8 of the state's 17 major river basins.

The cumulative fish mortality for all 2006 reports was 35,395 individuals. This figure represents a continued downward trend in total annual fish mortality reported since 2003. Mortality counts for individual events ranged from 32 to 13,220 with a median mortality of 340. The majority of events were observed in fresh waterbodies, however, the three largest events for the year occurred in estuarine waters. The annual report was presented to the NC Legislature in December. Further information on the fish community, fish tissue, and fish kill programs can be found at: <http://www.esb.enr.state.nc.us/> or by contacting Bryn Tracy, Mark Hale, or Jeff DeBerardinis at (firstname.lastname@ncmail.net).

Benthos

The benthos group has been very busy since the beginning of the year with samples collected **at 339 sites in 2006**. Basinwide sampling was conducted in the Lumber and Yadkin River basins and began with swamp sampling in February, and the remaining basinwide sampling conducted in July and August. A total of 123 basin sites were sampled, with the remaining 216 sampled during special studies. The QAPP for the benthic macroinvertebrate community assessment program was sent to EPA, Region 4 in July 2006.

Most benthos work in spring and fall is for special studies and the following were completed:

Environmental Enhancement Program (EEP) Sampling:

Seven sites in subbasin 01 of the Tar River basin were sampled for benthos in March 2006 for the EEP program to determine baseline conditions before a planned WWTP upgrade and development of a Local Watershed Plan by EEP. These samples showed very few water quality problems, except for the site on Fishing Creek below the Oxford WWTP, where nutrients and low dissolved oxygen may be stressors. Three sites on Fishing Creek were rated Not Impaired, Fair and Good going from upstream to downstream. Two sites in the Coon Creek watershed were rated Excellent and Good. Gibbs Creek also received a Good bioclassification. Sand Creek, a tributary to the Tar River, had a reduced but very intolerant benthic fauna which suggested that the stream may

periodically dry up and be slow to recolonize. Streams with a primarily sand substrate, had lower habitat scores, but still had Good bioclassifications.

Twelve stream sites were sampled for macroinvertebrates in another EEP study in Hiwassee subbasin 02. Seven were small-stream sites; i.e. the site drained an area less than 3.0 square miles. Six small-stream sites were assigned a classification of Not Impaired: Calhoun Branch at SR 1537, Cherokee County; Hampton Creek at SR 1558, Cherokee County; Messer Branch at SR 1533, Cherokee County; Pipes Branch at SR 1540, Cherokee County; Slow Creek at SR 1528, Cherokee County; Snead Branch at SR 1531, Cherokee County. The small-stream site near the mouth of McCombs Branch was assigned a classification of Not Rated. Of the large-stream sites, one classified as Excellent (Peachtree Cr at SR 1537, Cherokee County), two classified as Good (Martin Creek at SR 1576, Cherokee County; Peachtree Creek at US 64, Cherokee County), and two classified as Good-Fair (Martin Creek at SR 1558, Cherokee County; Slow Creek at SR 1531, Cherokee County).

Eleven sites were sampled for benthic macroinvertebrates in Alleghany County in April 2006 as part of an ongoing EEP local watershed plan. Nine sites had high water quality and were rated Good, Excellent or Not Impaired. The two urban sites on Bledsoe Creek were rated Good-Fair. Waterfalls Creek, two sites on Pine Swamp Creek, Brush Creek, and the Little River were Excellent. Laurel Branch and Moccasin Creek were Good. Wolf Branch and the upstream Bledsoe Creek site were rated Not Impaired due to watershed size, but both had diverse and intolerant benthic communities. The Bledsoe Creek sites in the town of Sparta showed the impacts of urban runoff and some indications of toxicity. Sites with little riparian zones that flowed through fallow fields or urban areas had the lowest habitat scores, but no major habitat problems were noted. Moccasin Creek had some indicators of nutrient enrichment and cows were noted upstream of the sampling location. Laurel Branch has a golf course and minor discharges upstream, but has maintained a Good bioclassification since restoration efforts took place between 1992 and 1998, following sediment inputs from construction of the Old Beau golf community.

Another EEP study of six sites in the Uwharrie River drainage was conducted plus one reference site with significant historical data. The reference site, Barnes Creek received a bioclassification of Excellent in the current study. Five study sites earned bioclassifications of Good and one site, Caraway Creek at Randolph SR 1331, earned a bioclassification of Good-Fair. Data suggested that habitat, versus water quality issues affected macroinvertebrate communities. Current and historical data and observations of the study sites indicate stable to slightly improved conditions since 1996 though development pressures in the watershed will likely exacerbate any habitat stresses already occurring

TMDL Sampling:

The first TMDL stressor study was in Yadkin subbasin 07. As a whole, the water quality has remained fairly stable at the sites sampled in the Abbotts Creek

watershed. Two sites, Abbotts Creek at SR 1800 and Rich Fork at SR 1755, have no previous benthic data, thus the stability of the water quality at these sites cannot be determined, but both were rated Good-Fair. Swearing Creek and Brushy Fork have fluctuated between Good-Fair and Fair, but no major changes in the benthic community were observed. Overall, five of the sites received Good-Fair ratings, two received Fair ratings (Abbotts Creek at SR 1243, Hamby Creek at SR 2017) and one received a Poor rating (Hamby Creek at SR 2025).

A total of 340 benthic taxa were collected from the 14 sites in a second TMDL/Stressor Study. These taxa along with the associated habitat and physical/chemical data, describe a wide range of natural and anthropogenic conditions found in these streams in the Catawba River subbasins 35 and 36. Three sites rated Excellent: Jacob Fork and the two upstream sites on Henry Fork. Eight sites were Good. These included the downstream sites on Henry Fork, including the dam on Henry Fork, and several Piedmont streams Howards Creek, Indian Creek (downstream site), Beaverdam Creek, Hoyle Creek and Pott Creek. One stream rated Fair, the upstream site on Indian Creek. Two sites rated Poor or Not Rated, Mauney Creek and Dallas Branch. All three sites with Fair, Poor and Not Rated bioclassifications appear to have one thing in common, the degrading influences of upstream WWTPs. Other sites have WWTPs upstream of the sampling locations (e.g. Jacob Fork, Pott Creek, Hoyle Creek) but these facilities do not appear to be adversely affecting the biota at those sites.

Special Studies: Regional Office Requests:

Seven sites were evaluated for benthos in subbasins 06 and 07 in the Yadkin River Basin in May. The three sites located in subbasin 06 received either a Good or Good-Fair rating. Olin Creek, which had no prior biological data, rated Good. Third and Fourth Creeks are 303(d) listed and were sampled north of I-40 to place boundaries on length of impairment. Both sites rated Good-Fair. Of the four sites located in subbasin 07, Abbotts Creek, which was sampled to provide data prior to the construction of a Dell plant, received a Good rating. Rich Fork and Hunts Fork are 303(d) listed and were sampled to determine whether they should remain on the impaired streams list. Rich Fork received a Good-Fair rating and Hunts Fork received a Fair rating. Hamby Creek, which was sampled to provide data prior to upgrading the Thomasville WWTP, received a Poor rating.

The Asheville Regional Office requested three sites in Yadkin subbasin 01. The three sites in this study support diverse macroinvertebrate communities. All three also had indicators of organic enrichment, though considering the entire community at each site enrichment is not likely to be limiting the fauna significantly. The site on the upper Yadkin River at Phoebe Lane and the site on Buffalo Creek both rated Excellent after benthic analysis. No water quality problems are indicated by the benthic data. The benthic data from Yadkin River

downstream of Hawkins Creek are difficult to interpret. The site received a rating of Good. For the site on Buffalo Creek an improvement in bioclassification from Good to Excellent was shown between 1988 and 2006.

The Winston Salem Regional Office requested 8 benthos samples:

Kings Creek at SR 1552/Caldwell County was requested for benthic sampling to monitor the effects of residential development in the watershed. The site received a classification of Good, though bordering on Good-Fair. Habitat homogeneity resulting from a dominance of sand as the bottom substrate is very likely depressing richness at the site. The site will be added to the basinwide schedule for continued monitoring as development continues in the watershed.

Laurel Creek at SR 1508/Watauga County at present supports a diverse and intolerant benthic community. There is no indication of impact at the site. The site will be added to the basinwide schedule for continued monitoring as planned development of the resort occurs in the watershed.

Yadkin River at NC 268 near Ferguson/Wilkes County was requested for sampling to monitor the effects of a shift from agricultural to residential landuse in the area. The site received a classification of Excellent, though bordering on Good. Several uncommon and rare taxa were collected. A steep descent is required to access the site from the road. Collecting at the site was difficult due to the presence of deep pools, and was restricted to a 75 meter long reach upstream of the road crossing.

Long Creek at SR 2334/Wilkes County was sampled to determine whether the site is still showing indications of impact. Fewer EPT taxa were collected in 2006 than in 2001; very low flow and less intense sampling methods in 2006 are likely causes for most of the reduction in richness. Indications of improved water quality are present, though better water quality may be the result of reduced runoff. The results of benthic sampling this year are ambiguous and do not support the removal of Long Creek from the state's 303(d) list.

Faulkner Creek at SR 1742/Surry County and Faulkner Creek at SR 1756/Surry County were sampled to determine whether the stream should be removed from the state's 303(d) list. Prior sampling in 2002 showed a sharp contrast in the benthic communities between the two sites, suggesting significant impact at the downstream site. The differences between the two sites in 2006 are not as great. EPT richness is identical at the two sites. EPT BI is significantly greater downstream than upstream, suggesting the possibility of a source of impact between the two sites. Resulting classifications from the two sites (Not Impaired and Good-Fair) supports the removal of the stream from the impaired streams list.

Rutledge Creek at SR 1774/Surry County was requested to monitor the effects of an increase in development and in the number of small-animal operations in the watershed. Benthic sampling resulted in a classification of Good, though

bordering on Good-Fair. The site may be added to the basinwide schedule for continued monitoring.

Heatherly Creek at US 52/Surry County was sampled to determine whether the stream could be removed from the state's 303(d) list. There are indications of improving biological conditions since the removal of the Pilot Mountain WWTP outfall upstream of the site. Assuming that biological conditions will continue at the site, and given that the site rated borderline Not Rated and Not Impaired, and further given that the BAU has not yet developed defensible biological classifications for small streams, the stream should be removed from the state's 303(d) list.

Lumber River Basin Regional Office Requests at 3 Locations

The Fayetteville Regional Office and the Planning Section requested that benthic sites be sampled during the 2006 swamp season. Sites were chosen to fill in areas without data and to assess the effects of animal operations and urbanization. These sites were Western Prong Creek at US 701 Bypass, Ashpole Swamp at NC 130, Leith Creek at SR 1609, White Marsh at US 74/76 and Juniper Creek at SR 1928. All sites rated Moderate, indicating no major water quality problems.

Special Studies: EPA Region IV Comparability Sampling:

As part of an EPA Region IV Comparability Study 11 benthos samples were collected in Tennessee and in South Carolina at locations sampled by biologists from those states. In turn, their biologists came to NC to sample 10 of our sites.

Special Studies: ORW/HQW Reclassification Sampling:

Savannah River Basin ORW Reclassification (Horsepasture River) at 11 Locations

The results of this study demonstrate that only that segment of the Horsepasture River beginning somewhere between NC 281 and the site above Windy Falls supports an aquatic macroinvertebrate community that yields an Excellent biological rating. It is reasonable to assume that this would be true for the remainder of the Horsepasture River downstream of this point due to the relative inaccessibility and wilderness nature of the watershed below this point. This segment of the river (NC 281 to Lake Jocassee) has been designated a state Natural and Scenic River and a National Wild and Scenic River. Thus, having excellent water quality and an outstanding resource, this segment meets the criteria for designation as ORW.

Eno River at 5 Locations

In both 2005 and 2006, five benthos sites on the Eno River resulted in four Good-Fair bioclassifications and one Good bioclassification. The Good location was at

SR 1561 in 2005 and SR 1569 in 2006. This represents a major decline from the Good and Excellent bioclassifications found in 2000 and 2002.

Madison County-Big Laurel Creek and Spring Creek watershed-19 benthos samples

The Biological Assessment Unit (BAU) in September 2006 completed a High Quality Waters/Outstanding Resource Waters (Hqw/ORW) evaluation of three stations on Big Laurel Creek and 12 tributaries to Big Laurel Creek (Figure 1). Several rare caddisfly and stonefly taxa were collected from many of the streams assessed in the Big Laurel catchment (Table 1). Of the 15 total samples, there were six repeat samples of long-term benthos sites (three on Big Laurel Creek, two on Shelton Laurel Creek, and one on Puncheon Fork; Table 2). The remaining nine samples represent new NCDWQ collections. As a result of this sampling effort, 14 of the 15 sites sampled received Excellent bioclassifications (Table 3). The only sample not to receive an Excellent bioclassification was Little Creek at SR 1318 which received a Good bioclassification. Four additional samples from the Spring Creek watershed were all Excellent.

Special Studies: Small Streams Sampling:

Piedmont Small Streams—Samples at 22 Urban and Reference Streams

Mountain Small Streams—Samples at 16 Urban and Reference Streams

Sandhills Small Streams—Samples at 14 Urban and Reference Streams

BAU has during 2005 and 2006 made an intensive effort at sampling small streams in order to develop criteria for rating such streams. We presently cannot rate small streams, except in undisturbed mountain watersheds.

Special Studies: NPDES Sampling:

Chowan River Basin NPDES Sampling Completed at 3 Locations

Sampling was conducted on Filbert Creek to evaluate potential impacts from reverse osmosis water treatment plants. No impacts were found.

Neuse River Basin NPDES Sampling Completed at 2 Locations

Benthos samples were collected above and below the Raleigh WTP, with impacts found below the outfall.

Pasquotank River Basin NPDES Sampling Completed at 2 Locations

Benthos samples were collected above and below the Bethel WTP, with impacts no found below the outfall.

Basinwide Reports and Memos

Basinwide assessment reports were prepared for the **Neuse, Chowan, and Pasquotank** river basins, and memo's were prepared were prepared for all special studies.

INTENSIVE SURVEY UNIT

Ambient Lakes Monitoring Program (ALMP)

2005 Lakes Assessments

The 2005 ALMP Lake Assessments for **25 lakes** in the Neuse, Pasquotank, and Chowan were completed in May of 2006. Preliminary write-ups and data were provided to the Basinwide Planners as they became available. ISU continued to work on improved presentation and assessment methodologies. Several meetings between ISU and Basinwide Unit were conducted to review the information and assist with development of the basinwide plans.

2006 Lakes Assessments

During 2006, water quality measurements and samples were taken at **320 sampling sites** on **26 lakes** monthly, May through September. ISU also submitted the 2006 Annual Report on Clean Lakes activities per EPA requirements documenting activities support by the 319 Clean Lakes Grant.

ALMP QAPP Development

Per EPA requirements, ISU developed a Quality Assurance Project Plan for the ALMP. This document is intended to provide information on all quality assurance and control during all phases of the ALMP. The document was sent to EPA in December 2006 for their review and approval.

Drinking Water Supply Reservoir Protection Act – Report to Environmental Review Commission (ERC) of NC Legislature.

In 2005, the Legislature adopted the Drinking Water Supply Reservoir Protection Act, which included a one-time report from the EMC on the status of water quality in water supplies sampled by the DWQ. The report was completed and presented to the ERC at their 11 April 2006 meeting. **Tens years of lakes data for 4 parameters (4,904 data points) was reviewed for 100 lakes classified as water supply.**

National Lakes Assessment Program (EPA)

Under a congressional mandate, EPA has developed probabilistic assessment for the nation's lakes and has set aside 106 money to cover the expense of collecting the data. In 2006, EPA began a series of meetings and conference

calls to develop state support and the overall methodology for collecting and analyzing the national data. ISU staff attended National meetings in Chicago and Indianapolis to learn more about what EPA and other states were envisioning for the process and to provide North Carolina's prospective. **ISU staff also reviewed 2 drafts of the Field Operations Manual and 1 draft of the Lab Manual**, as well as participating in a number of conference calls and emails during the development of the manuals. In addition, two ISU staff members **spent 3 weeks completing EPA's desktop recon form to identify 18 North Carolina lakes per EPA protocol** to be included in the study. **North Carolina does not plan to assist with sampling efforts.**

Lake Simon Ellis

Staff attended four meetings with Ecosystem Enhancement Program (EEP), Aquifer Protection and Lake Simon Ellis citizens to discuss local concerns that wetland mitigation may be resulting in decreased bass populations due to decreasing pH levels. DWQ data was not sufficient to determine if pH was decreasing in the lake. Site visits by EEP and Aquifer Protection indicated that low pH inflows had increased due to the mitigation.

Public Outreach

During 2006, staff worked with the North Carolina Lake Management Society to develop a workshop entitled: Lake Water Quality, Monitoring and Protection for Lake Associations. With other members of NCLMS, staff presented the workshop to the Kenilworth Lake Association in Asheville and received very good feedback. Staff is continuing to work the NCLMS to further develop the workshop, allowing modification based on a lake association's knowledge and experience in water quality and lake management. Staff also served as the Exhibitors Committee Chair for the 15th Annual Southeast Lakes Management Conference held in Georgia.

TMDL Studies – ISU worked closely with the Modeling Unit to develop and implement study plans for impaired waters.

Waterbody	Purpose	# of Times Sampled	Schedule
Jordan Lake	Provide pre-TMDL implementation data on nutrients, turbidity and physical parameters	108	Once per month through September 2008
High Rock Lake	Designed to provide additional information for parameters not normally collected during ambient monitoring (SOD, benthic nutrient flux, continuous temperature, total organic carbon (TOC), .	45 lake 36 tributary	Once monthly through September 2006
Lower Cape Fear River	Provide data for modeling low dissolved oxygen in the Lower	33	January & February 2006

Waterbody	Purpose	# of Times Sampled	Schedule
	Cape Fear at Wilmington. Included flow measurements, dye study and Sediment Oxygen Demand sampling. Sampling completed in February.		
Pigeon River	Development of a biological TMDL. Sampled water and sediment.	5	September 2006
Yadkin-Pee Dee Catawba Upper Cape Fear	Additional sampling at impaired sites to obtain data necessary to identify the stressors (pollution, habitat destruction, etc.). Included water, sediment and flow in most cases.	Yadkin-Pee Dee – 18 Catawba – 26 Cape Fear – 11	March through October 2006
Lake Waccamaw & Phelps Lake	Extension of the low level mercury study – collecting data on low level total and methyl mercury. Required clean sampling using methodology perfected by ISU staff.	40 samples	3 times through July 2006

Stakeholder Group Participation

- Jordan Lake – Attended **five 4-hour meetings**, providing input on on-going monitoring and development of new modeling strategy. Attended numerous in-house meetings and exchanged many emails on this issue.
- High Rock Technical Advisory Committee (TAC) – Attended **five meetings (7 hours just for meetings and travel)**. Provided input on on-going monitoring and development of monitoring strategy to support TMDL development. Attended numerous in-house meetings and exchanged many emails on this issue.
- Falls of the Neuse TAC – Attended **two 4-hour meetings**. Provided support to modelers in discussions of monitoring and modeling needs.
- Lower Cape Fear – Attended **one meeting** to provide update on ISU's finalization of its monitoring reports.

Use Assessment Related Studies.

Waterbody	Purpose	Sampling Information	Schedule
Falls of the Neuse Reservoir	Collect additional data to support use assessment and modeling. Triggered by high chlorophyll-a concentrations. This study also is being used to guide development of	Sampling Site Visits <ul style="list-style-type: none"> • 216 lake • 30 tributary (Stream stations were	Twice monthly in lake & at ambient stream stations through September 2006. Every

	TMDL modeling studies. In addition to traditional WQ sampling, in-situ temperature sensors were used to support modeling needs.	sampled by RRO – 144)	other month at 5 tributary stations.
Morgan Creek	This study involved collecting fecal coliform bacteria samples to meet the 5 samples in 30 days requirement in the standards. The study was conducted at the request of the RRO due to concerns related to the Lemola Dairy Farm located on Morgan Creek and elevated bacteria samples.	4 Stations	5 times within 30 days – ended in January 2006

Misc. Division Support

Drought Management Advisory Council

Staff has attended 5 meetings (2 were the full Drought Management Advisory Council) and participated in 30 conference calls (1-2 hours each). In addition, staff developed a Drought Monitoring Plan in June due to increasing drought in the Neuse and Cape Fear River basins. Fortunately, the rains came and removed the need for additional sampling. The Drought Management Advisory Council was created in 2002 by the General Assembly and was given the charge of issuing advisories and coordinating drought responses. Beginning in mid-2005 and still underway, a subset of the Advisory Council has participated in weekly phone calls due to drought conditions. These calls are used to advise the ACOE on operation of their reservoirs/dams and to keep everyone informed as to the impacts of drought conditions on water supply, water quality, wildlife and the public.

Rocky River (Siler City) Management Team

Staff participated in 1 meeting of the Rocky River Management Team during 2006, compiling historic water quality data for presentation and providing insight into sampling on the river.

Nutrient Criteria Development Work Group

Worked with Planning Section to develop RFP for Lake User Survey and Data Compilation.

Hearing Officer – Triennial Review 3 Public Hearings

Regional Equipment Support

Staff continues to assist regional offices with meter maintenance and repair with one or two meters being received or sent out each month.

Training

- CPR/First Aid – all ISU (8 people counting supervisor)
- Emergency Response
 - ISC-100 – all
 - ISC-700 – all
 - PPE's, Confined Spaces & Bloodborn Pathogens – 1 (Safety Officer)
- Team Building – all
- Lab Sample Submission Training – all
- Field Technique – D50 Partical size evaluation by Wetlands Group – 4
- ArcGIS – 1
- EPA's Water Quality Standards Academy – 1
- Lakes TMDL Training Workshop – 1 (also presented info on ISU)
- Provided opportunity for Permitting and Modeling staff to assist with monitoring – 10 different staff members for the 2 groups
- Certified Public Managers Program – 1
- Model Workshop – 1

Attended 2 Reclassification public hearings to provide support for DWQ staff – Fontana Hearing & the Big Broad R & North Prong of the First Broad Hearing

Removed the Hookerton Gaging Station and Platform that was installed during the Neuse River nutrient loading studies in 1999.

Developed Hurricane Preparation and Follow-Up Plan for ESS and kept it updated through hurricane season

AQUATIC TOXICOLOGY UNIT

Introduction

The Aquatic Toxicity Unit (ATU) experienced major changes over the course of 2006. The Unit Supervisor, Matt Matthews left in May to become the Point Source Supervisor and Kevin Bowden, Compliance and Enforcement Lead, moved to a new position as liaison for regional offices and central office in August. Together these staff had more than 40 years of combined experience with ATU. The unit is still trying to complete the hiring cycle to become fully staffed.

Compliance and Enforcement

All permitted dischargers of complex wastewater in the state are required to perform self-monitoring of aquatic toxicity of their wastewater. Currently this

totals over **520** industrial and municipal facilities. The ATU reviews all toxicity data reported by these facilities to verify data quality, track compliance with established permit limits, and make enforcement recommendations for non-compliant situations.

ATU Compliance reviewed and documented over **2180** aquatic toxicity test forms into the 4-D Self Monitoring Data Base System. ATU reviewed over **77** draft permits, verifying all information was correct specifically for the bioassay monitoring requirement, including language, limits, targeted month of testing, etc in the permit. ATU reviewed for completeness over 98 new permits for this same information regarding toxicity monitoring requirements.

ATU Enforcement sent out **102** Notices of Violation (NOVs) for noncompliance of the Whole Effluent Testing (WET) NPDES requirements. Included in these were **71 NOVs** for limit non-compliance, of which 28 were for NPDES permits that included the copper and zinc action level policy notices. There were **21 NOVs** for non-reporting or late reporting. ATU issued **10** Notices of Deficiency (**NODs**) in lieu of NOVs. NODs are issued rather than NOVs for deficiencies such as reporting the WET data on their monthly DMR but then not sending the toxicity test report ATU. There are various other reasons that ATU assesses severity in issuing NODs versus NOVs. There were 3 warning letters sent for minor monitoring infractions.

ATU Enforcement had **10 civil penalty assessments** over the course of 2006 for either late/non-reporting or for limit violations. ATU reviewed over 35 other documents for TRE/TIE progress reports, consent orders, copper and zinc final reports, biocide 101 forms for NPDES permit renewal, and various other toxicity reviews.

Overall facility compliance with self-monitoring limitations established by a facility's NPDES permit averaged 97%. 2006 compliance rates for municipals and industrials facilities were :

Major Municipals	98%	Major Industrials	100%
Minor Municipals	95%	Minor Industrials	94 %

Enforcement and Compliance updates the Basinwide Information Management System (BIMS), the 4-D Database for ATU, and the Suspense Log that details all contact information concerning enforcement and compliance. ATU maintains a facility file with all pertinent information regarding NPDES enforcement and compliance.

Enforcement and Compliance incorporates interfacing with various agencies within Division of Water Quality (DWQ) including Regional Offices, Central Office, as well as NPDES facilities and certified commercial and municipal toxicity labs. ATU has provided training for Regional Offices, as well as other NPDES facility

meetings through presentations concerning the toxicity requirements as related to NPDES permits.

Lab Certification:

All toxicity analyses reported by dischargers must, by water quality regulations, be performed by a biological laboratory certified by the State for these tests. The ATU operates this certification program, which includes, laboratory inspections, data tracking, and performance evaluation testing (PE testing). PE testing is an annual "blind round robin" testing procedure in which our lab (ATU) prepares an unknown chemical mixture and submits it to all North Carolina certified WET labs. The data is statistically interpreted in order to determine if all certified labs are able to meet the performance parameters.

For the year 2006, ATU **certified/recertified 12 labs** for WET testing and Aquatic Population Survey Analysis. ATU performed **11 laboratory inspections** and reviewed all Standard Operation Procedures for these labs. ATU sent out 9 Performance Evaluation samples, which included Acute Fathead Minnow, Acute Ceriodaphnia dubia, and Phase II Ceriodaphnia dubia toxicity test samples, as well as select chemical analyses. ATU generated and submitted the Environmental Science Section's (ESS) FY 2006 Activity Report to the USEPA on a quarterly basis, as well as an annual report.

Lab Section:

In order to evaluate biological effects, aquatic toxicity tests are utilized by the ATU, allowing determination of the combined effects of all constituents of a complex mixture. These biological analyses therefore are very efficient and effective at predicting integrated aquatic effects without requiring complete chemical analysis of the test solutions. These results are an assessment tool in order to make predictions of individual and/or multiple chemical effects. Tests may be conducted on samples of complex wastewater, individual chemical compounds, or surface water. These tests can be sensitive enough to determine not only lethality but also suppression of reproduction or growth of test organisms, effects that may ultimately reduce instream populations. The ATU maintains extensive scientific literature on the effects of many chemicals, which allows us to predict effects based on past testing by other researchers. This program has become a nationally recognized leader in its field and has produced demonstrated benefits in reducing the discharge of toxic substances in toxic amounts. By incorporating whole effluent toxicity monitoring with "Action Level" water quality standards, North Carolina has been able to avoid costly and unnecessary regulation of several ubiquitous wastewater constituents.

DWQ has a Whole Effluent Toxicity (WET) monitoring program that is coordinated with the Regional Offices to monitor 20 % of the major permit holders. The Regional Offices select the facilities within their region to schedule an ATU specified number of sampling events each year. ATU is dependent on the regional staff to perform the sampling and thus meet this testing goal. We also specify for a variety of test types and conditions (see table 1). The ATU lab

section performed over **130** NPDES compliance tests for our NPDES monitoring program. There were **16** acute tests and **37** chronic tests performed. Of these 53 tests, 13 were split with a contract lab. Along with the 8 ambient samples submitted for toxicity test, we also performed **57** quality assurance tests.

Table 1 illustrates test requests to Regional Offices*.

Table 1. Requested test numbers and types for the entire FFY 2006-2007^a.

	Facility Cerio Acute LC50	Facility Cerio Chronics	Facility Fathead Acute Pass/Fail	Ambient Tests	Splits	Major Facilities within each Region	20% of Majors ATU is requesting
ARO	4	10	0	2	2	32	7
FRO	3	8	1	3	2	29	6
MRO	1	14	2	2	2	48	10
RRO	1	10	3	3	2	41	9
WaRO	0	8	4	2	2	29	6
WiRO	1	5	4	2	3	22	5
WSRO	1	11	0	2	3	30	6

*October 2006-September 2007.

During the year, ATU performed over **232 special toxicity analyses** for various programs. ATU has developed the water and sediment Watershed Toxicity Assessment Program (WTAP), in conjunction with Ecosystems Enhancement Program (EEP) via the Watershed Assessment Team (WAT) to provide a comprehensive toxicity testing component for watershed assessments. During the year, ATU performed WTAP assays on samples for **7 watersheds** for WAT/EEP and on samples from **2 watersheds** for the Total Maximum Daily Load (TMDL) Unit. ATU also performed special studies for various Regional Office projects. These special studies included Raleigh-Durham Airport storm water runoff projects as well as samples for the EQ fire in Apex, NC and the Synthron fire in Smithfield, NC.

Miscellaneous Support & Programs:

Sandy Mort- Communication Initiative Meetings- Employee of the Year

Kevin Bowden gave a power point presentation to the Carolina Setac Meeting, "How To Get Along With Your Auditor".

Sandy Mort made multiple presentations on the watershed toxicity assessment program (WTAP) to WAT, EEP, DWQ, FRO, and DHHS staff, as well as to the supervisor's meeting in Nags Head.

Sandy Mort-Provided assistance to a NCSU graduate now doing a post doc in Japan regarding ATU's WTAP testing and data presentations methods.

Lab Section -Assisted Museum of Natural History with abnormal tadpole activity in their site pond.

Lab Section -Participated in an International Collaborative Study on the AlgalTOXKIT assay

Training:

Cheng Zhang & Nicole Remington-4 day General Toxicology course at NCSU Toxicology Communication

Sandy Mort -3 day American Chemical Society's short course –Statistical Analysis of Laboratory Data.

Sandy Mort- Attended Duke University's Integrated Toxicological Program Seminar.

Lance Ferrell –Attended day one of the 2006 Symposium "North Carolina Coast: You and Your Ecosystems" at Carolina Beach, NC.

Future Projects

- Continued Development of WTAP methods – Focus on sediments and storm water to improve toxicant discrimination, and detection sensitivity, as well as improve responsiveness to unplanned toxic events (i.e. spills, fires, storms). Add immunoassay based testing capabilities to enhance toxicant identification and quantification. Continue refinement of data interpretation and presentation methods.
- Endocrine Disruptors – Seeking systems to test for estrogenic and androgenic effects
- Mussels – Seeking source of suitable test organism for toxicity testing methods development.
- Modify fish culture lab for expanded lab assay space – needed to accommodate current testing activities and better utilize available lab space.
- Update procedure documents:

- North Carolina Biological Laboratory Certification/Criteria Procedures Document, February 1998
- North Carolina *Ceriodaphnia* Chronic Effluent Bioassay Procedure, Revised February 1998

North Carolina Phase II Chronic Whole Effluent Toxicity Test Procedure, Revised February 1998

ECOSYSTEMS UNIT

Coalition Monitoring Program

The NPDES Coalition Monitoring Program gained new people this year - Jennie Atkins and Carol Hollenkamp. We now have six monitoring coalitions collecting and submitting electronic data monthly at approximately 270 locations. **The program, which expanded in to the Tar-Pamlico basin this year, has 148 NPDES facilities participating** representing 47% of the permitted wastewater flow in the state.

EEP contract for Environmental Assessment Support (Periphyton)

By agreement with the Ecosystem Enhancement Program, DWQ established a new two-year temporary position to evaluate the water quality assessment potential of attached algae in streams. We were fortunate to hire Wanda Gooden, who received her PhD from Bowling Green, OH, where she worked with Dr. Rex Lowe on the impacts of consumer products such as surfactants on the ecology of attached algae. Wanda will be working with DWQ to construct technical documents summarizing the literature on sampling methods, techniques for analysis, and ecological interpretations using attached algae in streams. In collaboration with other DWQ biologists, Wanda will evaluate the efficiency and efficacy of using attached algae assessments to determine designated use impairments, violations of water quality standards, or as a potential assessment tool in identification of stressor gradients.

New Probabilistic Monitoring Program (RAMP)

Over the past few years we have been consulting with EPA Corvallis, to design a statistically based random monitoring program that would efficiently evaluate all of the fresh waters of the state using probability theory for inferring the quality of "all the states waters". This year, we successfully developed a practical random monitoring program that overtime will provide support for probabilistic statistically valid water quality statements covering all of the freshwater streams represented on 1:100,000 scale geographic information systems. The Random Ambient Monitoring Program (RAMP) began collecting samples from freshwater streams (defined as non-tidal, non-lake/reservoir, non-saltwater) in January 2007. **Twenty-nine random sites will be sampled once per month for 2 years, and then will be retired. At that time new sites will be chosen, and will be sampled for 2 years.** This cycle will continue for the life of the program. RAMP will allow us to answer broad questions with

statistical rigor that otherwise are not answerable. This type of program is the only way to evaluate all the waters of the State without comprehensively sampling every individual stream. RAMP will also allow us to collect data on parameters with water quality standards that are rarely or never collected within our existing programs.

Basin Reports

We continue to produce Basinwide Water Quality Assessment Reports for the entire state on a rotational basis. Data from the DWQ ambient network and from NPDES coalition stations are formatted into statistical summary sheets and tables, with box plot graphs. **Time series graphs and maps are produced and represent a synthesis of over 600 monitoring locations.**

Algal and Plant Analysis

Elizabeth Fensin and Mark Vander Borgh, regularly monitor the algae and aquatic plants in lakes and coastal rivers helping DWQ keep an eye for potentially noxious situations. The approach is to explain the ecology of freshwater and estuarine algae to staff and the general public. Once primarily responding to blooms reports and fish kills, they now concentrate their efforts on long term monitoring. **We have now compiled 7 years of data on the Neuse, Pamlico, and New Rivers.** On the freshwater side, efforts this year focused on characterizing the algae of High Rock, Jordan and Falls Lakes to calibrate and validate TMDL models. More than **500** samples were analyzed and characterized this year. We have developed and are now using SOP's, taxa reference lists, and enhanced databases for scientific consistency. We have also constructed educational information sheets on many different types of algae and related organisms that are available for staff and the general public.

Technology Systems Support

The challenge of supporting water quality data loading to EPA national data warehouses such as STORET is ever increasing. We have also been preparing for EPA to abandon STORET data management in favor of a new system called WQX data storage. We have met with Randy Moody about this node-based approach using WQX. The next step is for EPA to release WQX and for us to complete the development of an XML parser in order to create XML documents for upload to WQX using the node. We have also increased system reliability against a catastrophic failure. Backups of STORET occur every time ESS sends a new data dump to the EPA. We have successfully moved our web site to a server downtown as part of server consolidation. The Web server is backed up by ETU. There were no major changes to the 4D database but the server it is on has been maintained through out the year and backups made on a regular basis. The main file server, NRDWQ06, has been working well and all patches have been applied to the server through out the year. Backups are performed on NRDWQ06 on a daily basis. In June of 06 we lost connectivity to the Archdale building when they changed firewalls systems. Connectivity should be re-established using new firewall by April 2007. ESS has been part of the ESAP

(Enterprise Services Access Point) project, which is a statewide project to enhance security to the State network. ESS has changed its firewall and readdressed our servers and workstations to the IP range provided by OITS.

Ambient Monitoring System (AMS)

The surface water ambient monitoring system has 339 monthly monitoring locations. At these locations DWQ collects and evaluates a number of different water quality variables. The size and complexity of this program generates enormous logistical challenges from collection orchestration, laboratory liaison, data review and database warehousing to ensure publicly available information. In addition, monitoring staff turnover in the regions requires nearly constant ambient training somewhere in the state. These challenges are extreme! Fortunately, DWQ has Andrea Thomas as our AMS coordinator. Andrea was recognized this year as the most outstanding employee within DWQ.

STORET

EPA will begin to sunset STORET. EPA will only be supporting STORET until 2008. **There is no doubt that this will pose a severe challenge for DWQ.**

Quality Improvements

2006 was an important year for improvements in quality. **We developed (and submitted to EPA) Quality Assurance Program Plans for the Ambient Lakes Monitoring Program, the Benthic Macroinvertebrate Community Assessment Program, and the Fish Community Assessment and Fish Tissue Monitoring Programs.** After a thorough internal review of field meter practices across the state, we developed new Field meter calibration procedures to help improve data and to streamline and unify documentation. We also established new meter proficiency testing procedures with the cooperation of the USGS National Field Quality Assurance (NFQA) Program. Participants who received *unsatisfactory* rankings were required to attend a meter-training workshop. **Several meter-training workshops were offered to staff members from various offices and program across DWQ.** These workshops provided participants with hands-on training and interactive discussions concerning proper

calibration methods, troubleshooting tips, and general maintenance of meters. In 2007, approximately 45 DWQ staff members will be participating in the annual proficiency testing.

Integrated 305(b) and 303(d)

We have spent a considerable amount of time across all of ESS in the contribution, review, and facilitation of information contained in the document submittals to EPA and the public.

Chemistry Lab LIMS

Staff have worked very hard to review and assist in the use and development of the DWQ Laboratory Information Management System

Southeastern Plains In-stream Periphyton, Nutrient, & Biological Response (SPINBR)

We have participated along with EPA Region 4 and associated states in a regional approach for developing a diagnostic diatom tool for use in investigating nutrient dynamics in streams. The project included collecting periphyton and nutrient samples from a number of streams within a single ecoregion. Sites were selected from a broad range of impairment conditions so that the relationship of nutrients and periphyton could be analyzed along a gradient of disturbance. The goal is to describe the relationship between human disturbance, periphyton occurrence, and nutrient concentrations. It is expected that the project will result in refinement and regionalization of periphyton sampling methodology and make a significant contribution in available periphyton and nutrient data within Region 4. Additionally, EPA Region 4 hopes to extend its outreach and collaboration with states agencies on nutrient issues. Qualitative periphyton sampling methods developed by Florida DEP were used.

ModMon and FerryMon

As long as funding is available, we continue to liason and manage contracts with the UNC Neuse River ModMon program and the FerryMon program.

Evaluations of Primary Recreation for DWQ Monitoring

Fecal Coliform data collected at all Ambient Monitoring stations were screened for recreational criteria. In 2006, a total of 60 locations (16%) exceeded some part of the screening levels (74 stations in 2005). Of these 60 locations four of these were designated as class B or SA with primary recreation uses.

Communications and Information Sharing

Monitoring the waters of the state and communicating what we learn through our testing is a high priority. Our primary mode is to organize and offer our information on the web. Each month our web site disperses millions of bytes of data to the public. **More than 44 web pages with appropriate links provide data on fish kills, chemical results, algal assessments, Basinwide Reports, whole effluent monitoring, benthic macroinvertebrate information, and ambient lakes testing.**

PAMLICO RESPONSE TEAM

Response Calls

120 calls dealing with:

- Dead or diseased fish
- Foam /discolored water
- Sewage spills
- Algal blooms
- WQ concerns
- Misc investigations
- Inter-agency/Regional assistance
- Information requests

Of which approximately **200** samples were taken.

WaRO assistance

Buffer Rules- **42 stream determinations.**

Rose Acres Special Study- **504** samples taken.

Evaluation of nutrients in area surrounding Rose Acres Poultry operation in Hyde County (bimonthly).

Striped Bass Effluent Special Study- **125** samples taken to date.

Aquaculture farm sampling across lower Pamlico River watershed –5 Individually owned aquaculture facilities are being sampled for potential water quality concerns. Each facility will have all three of their Phase I, II or III ponds sampled over the course of a year.

National Coastal Assessment Program

12 sites sampled for barrage of tests per EPA protocols including benthos, water quality, and fish habitat across coastal North Carolina with associated QA/shipment within 3 months.

Inter/Intra Agency Research

Submerged Aquatic Vegetation Mapping-

Per Environmental Sciences Section initiative are conducting shoreline mapping of all Pamlico and Neuse River estuaries and associated tributaries. **Over 15 more creeks and tributaries have been mapped this year 22 in the Neuse River estuary.** Data are being digitized and will be available for all GIS users. Final report being written and edited for **website and public usage.** Also are meeting with multi-agency SAV task force and will be helping with survey's outside of our basins in 2007.

USGS

36 trips to maintain real-time water quality data platforms along the Pamlico and Pungo Rivers. Three fixed stations maintained year around (weekly during summertime, monthly during wintertime).

2006 Ambient Monitoring Summary

2,124 samples collected during 2006
5 monthly sites (west to Falkland, Bethel)
3 weekly sites (Greenville)
30 monthly Pamlico River stations

Neuse River Response Team 2006

RESPONSE

Hotline Calls

52 calls dealing with:	Dead or diseased fish	Oil Spills
	Foam or discolored water	Misc Investigations
	Sewage spills	Inter-agency
cooperation		
	Algae Blooms	Information
requests		
	WQ concerns	

WaRO assistance

17 specific instances of compliance or violation investigations related to WQ in the Neuse Basin (primarily lower estuary).

Riparian Buffer Rules

52 stream determinations

6 Buffer Rule violation investigations.

SAMPLING

Ambient Monitoring

38 sites

33 monthly, 5 weekly with associated QA/QC and sample shipment

NCAP

25 sites across coastal NC with associated QA/QC and shipment of samples

SAV (Submersed Aquatic Vegetation)

Neuse and Trent Rivers

22 creeks in Neuse river estuary mapped and digitized

USGS

Maintained successfully year round: Once per week from May through October

Once every 3 weeks November through April

Kentucky SWPBA update

We will keep it brief this time around since we are all busy playing in creeks.

Ecological Support Section

We have plans to sample about 60 creeks this year. 35 of them are headwater streams and must be sampled prior to June 1st to keep within index period. It has really kept us hopping this spring. Patrick Hoban has joined us as a biologist, and will be working especially with the microbiology aspect of things. We plan to continue sampling runoff events in the months of May and June to get additional information for nutrient criteria.

401 Certification Section

WQC has recently conducted interviews for two new employees. One will be a project manager and the other will be a compliance & monitoring position.

We are finishing up the certification actions for the 2007 USACE Nationwide permits

Standards and Specifications Section

The Standards and Specifications Section was able to meet the deadline for the off-year electronic submittal of 305(b) data on March 30th. Assessments for the Upper and Lower Cumberland/Tennessee/Mississippi/Ohio basins were included for this round. The reach indexing maps should be ready this summer.

From there, we jumped right in to monitoring in April. We are working this year in the Big and Little Sandy and Tygarts Basin Management Unit. We have 50 probabilistic stations, both headwater and wadeable streams, mapped out for this year. There are 7 lakes that we do trend monitoring on in this BMU. A total of 36 ambient stations will be sampled on a monthly basis in the Big Sandy watershed. Variables to be monitored will include nutrients, metals, low level mercury, *Escherichia coli*, and bulk (alkalinity, chloride, sulfate, hardness, total organic carbon, and TSS) variables. Pesticides will be sampled at three sites. Volatile organics will be sampled upstream and downstream of the Catlettsburg Ashland Oil Refinery complex. Sediments will be collected at 10 sites once during low flow conditions. Sediment samples will be analyzed for metals and semivolatile organics. Ambient stations outside the Big Sandy watershed will be sampled bimonthly.

We have also enlisted Kentucky Geological Society to help design and carry out a surface-water and aquatic-life sampling program for selenium (Se) in the

Eastern Kentucky Coal Field. The plan is to sample mine sites that have equivalent stratigraphy to those strata found in West Virginia that have been studied the past 4 years with respect to elevated Se concentrations. The research plan calls for sampling 3 active mines, 2 abandoned mines, 1 reclaimed mine and 1 control site (no mining). At each of these sites samples will be collected from water, macroinvertebrates, fish, and sediment in streams above and below sediment ponds, and in the sediment ponds as are available.

TMDL Section

Danielle Rogers has transferred to the Morehead field office, just after giving birth to a beautiful daughter, Grace. Scotty Sharp has also left his position in the Madisonville field office after having a new son, his third. Jessica Schuster is trying to hold down the fort here in the Frankfort office, but will be going on maternity leave in September. Yes, it really is in the water for the TMDL section.

Ann is busy doing interviews and trying to find people to fill all the newly vacant positions. Everyone is keeping busy doing their normal positions and helping out in the field.

Nonpoint Source Section

Jessica and Rodney are sampling many creeks this spring. They are also in the lab on rainy days trying to finish off identifications from last year.

News From Florida:

Florida Recalibrates the Stream Condition Index

Florida recently revised its Stream Condition Index (SCI), a 10 metric composite index which was developed using the Human Disturbance Gradient technique. For translating index values into Biocriteria for Florida streams, we primarily followed the EPA 2006 Biological Condition Gradient approach. For this method, a panel of 22 regional scientists examined data representing multiple tiers of aquatic life use for the ultimate purpose of defining biological criteria for state water quality standards. In addition, the experts recommended a threshold of biological condition at which impairment occurs as a result of human disturbance. A secondary, but parallel analysis based on departure from reference condition yielded similar index values for the impairment threshold. Based on these complementary results, three categories of aquatic life use are proposed for Florida streams and described as Category 1 ("exceptional"), Category 2 ("healthy"), and Category 3 ("impaired"). Another revision to the SCI involved laboratory sub-sampling methods. We now calculate the SCI based as an average of two aliquots of 150 individuals (300 total), which substantially improved the precision of the index. Florida is confident that these improvements to the SCI make it among the most scientifically defensible Biocriteria tools in the US.

TENNESSEE

The Tennessee biologists have been plenty busy since last we met. In September we published the final report on a probabilistic study of 75 streams below small impoundments. The study measured the effects of the impoundments on macroinvertebrates, nutrients, dissolved oxygen, pH, iron, manganese, habitat, flow and periphyton density on the downstream reaches. The entire report can be downloaded from our website <http://www.state.tn.us/environment/wpc/publications/>

Macroinvertebrate communities were adversely affected in most of the streams sampled. Of the 75 sites below impoundments, only four passed biological criteria guidelines or were comparable to first order references in both seasons sampled. The most frequent change in the benthic community structure was a loss of taxa in the generally intolerant orders, Ephemeroptera, Plecoptera and Trichoptera (EPT). Ninety-six percent of the samples failed to meet reference guidelines for the number of distinct EPT taxa. The abundance of EPT that were present was also reduced, with 86 percent of the samples having low EPT density. Higher numbers were generally due to the abundance of a single nutrient tolerant taxon. The loss of other taxa was also evident, 87 percent of the samples failed to meet taxa richness guidelines. A shift in the type of dominant organisms toward more tolerant taxa was also observed.

Lack of adequate flow was one of the biggest problems downstream of impoundments. Approximately one third of the perennial streams that were randomly selected for reconnaissance were dry. Of those with flow during the summer reconnaissance, one-fourth had dry channels by the fall sampling period. Thirty-nine percent of the dams with year-round discharge provided insufficient flow to supply adequate habitat for aquatic life during at least one season.

The Rosgen stream classification system was used to characterize the geomorphic effects on streams downstream of dams in the 14 ecoregions surveyed (Rosgen, 1996). Using this classification system it was apparent that many of the streams below the impoundments in the study had channel structures that were undergoing geomorphic change. Only about half of the streams appeared to have relatively stable channel structures typical of the ecoregion.

Disruption of habitat was a major concern below most of the impoundments. Sediment deposition was the most significant habitat problem in impounded streams with 80% failing to meet regional expectations. The sediment deposition parameter measures the amount of sediment that has accumulated in pools and the changes that have occurred to the stream bottom as a result of deposition. High levels of sediment deposition are symptoms of an unstable and continually changing environment that becomes unsuitable for many aquatic organisms. Other frequently documented habitat problems included embeddedness of substrate, instability of banks, loss of stream sinuosity and disruption of bank vegetation.

The most frequently encountered chemical water quality problems below impoundments were elevated iron, manganese and nutrients as well as low dissolved oxygen concentrations. Elevated manganese was the number one problem. Ammonia was the most frequently elevated nutrient.

Dissolved oxygen in lakes and streams is critical to support fish and aquatic life. Low levels of dissolved oxygen may be caused by decay of organic material, respiration of algae, inflow of substantial amounts of ground water, or reduced stream flow. Dissolved oxygen was below criteria in at least one season at 21 of the impounded test sites. Many sites that passed dissolved oxygen criteria during daylight hours did not maintain saturation comparable to reference levels. Streams with dissolved oxygen saturation below this level may not be providing adequate oxygen to support benthic communities appropriate for the ecoregion.

Water temperature is an important component of the aquatic environment. Almost all facets of life history and distribution of aquatic macroinvertebrates are influenced by temperature. Eight of the impounded streams violated the temperature criterion at the time of sampling. Most of the test sites fell outside the temperature ranges found in regional reference streams.

Low pH, elevated alkalinity, or a significant change in the pH or acidity of the water over a relatively short period of time, can greatly impact aquatic life. The affects include respiratory or osmoregulatory failure, inability to molt and alteration of habitat through precipitation of iron. The majority of streams met pH criterion although iron and manganese precipitates were frequently observed.

Approximately half of the impounded test sites had elevated suspended solids (TSS) compared to regional reference streams. Total suspended solids (TSS) can include a wide variety of material, such as silt and decaying organic matter.

High TSS can block light from reaching submerged vegetation. Particles can clog gills, reduce growth rates, decrease resistance to disease and prevent egg and larval development of benthic fauna. Suspended particles absorb heat from sunlight, which can result in higher water temperatures. Pollutants such as bacteria, nutrients, pesticides and metals may attach to sediment particles and be transported to the water where they are released or carried further downstream.

High concentrations of heavy metals are toxic to aquatic life while precipitation of metals can render habitat unsuitable for colonization. Iron was above the recommended criterion of 1,000 ug/L at 61% of the impounded test sites. Manganese was above the 90th percentile of reference data at almost all sites.

Elevated nutrient concentrations are a common problem in surface waters in Tennessee. Impoundments have a tendency to trap nutrient runoff from surrounding land use, which can accelerate eutrophication. This nutrient rich water is then released to the stream. Nutrients can affect aquatic fauna through the stimulation of algal growth. This in turn can deplete dissolved oxygen levels and render substrates unusable for colonization by aquatic fauna. The presence of excessive nutrients can cause result in shifts of the benthic community toward organisms that feed on algae and fine organic matter.

Concentrations of total phosphorus, total ammonia, nitrate+nitrite and total Kjeldahl nitrogen (TKN) below each impoundment were compared to the reference database and first order reference streams to determine if excess nutrients were available for algal growth. Ammonia was the most frequently elevated nutrient followed by total phosphorus, TKN, and nitrate+nitrite.

When compared to ecoregion or first order reference sites, about half of the impounded streams had elevated periphyton density. Algae were abundant at more sites in the fall than in the summer probably due to lower canopy and less flow in the fall. More sites had elevated microalgal density than filamentous macroalgae. However the sites with filamentous algae had more severely impaired macroinvertebrate communities. Worms and midges dominated most of these samples. Macroalgae abundance showed a direct relationship with nutrients (TKN) and percent canopy.

We are excited about participation in the national lakes and reservoir's assessment. Twelve reservoirs were selected in Tennessee for monitoring. Half

of these are large TVA (5) or Corps of Engineer (1) reservoirs. Four are privately owned and two are in state parks.

We are using the 106 supplemental funds to conduct a probabilistic-based study of streams in Tennessee that will build upon work previously accomplished during EPA's 2004 Wadeable Streams Assessment (WSA) survey of the nation's streams. Biological, physical, and chemical data from a random sub-sampling of Tennessee streams will be extrapolated to all wadeable streams in Tennessee. These data will provide a baseline to which future efforts can be compared, thus providing an opportunity for scientifically valid trend analysis.

Thirty randomly-selected stations in each of three areas (90 total sites) based on aggregated Level III ecoregions in Tennessee were randomly selected with help from Tony Olsen, EPA Corvallis. The three aggregated regions are: East Tennessee including the Blue Ridge Mountains (66), Ridge and Valley (67), Southwestern Appalachians (68) and the Central Appalachians (69); Middle Tennessee including the Interior Plateau (71), and West Tennessee including the Southeastern Plains (65), Mississippi Alluvial Plain (73) and the Mississippi Valley Loess Plains (74).

We are currently reconning the sites for suitability and access. In July we will begin quarterly sampling of nutrients. We also intend to do bacteriological, macroinvertebrate, habitat and periphyton assessments at each site. We hope to be able to combine data for stations within each region, plus the entire state to extrapolate to the larger area.

Alabama Highlights

Two New Folks

We've recently hired two new folks – Tonya Mayberry and Scott Hicks - that have been assisting with our rivers and streams and rivers and reservoirs water quality and bioassessment sampling. So far, they've been doing wonderfully-and we have no doubt that they'll hang there in the Alabama heat and humidity this summer. Hope that you all will get a chance to meet them at the SWPBA meeting this fall.

ADEM's Monitoring Strategy

Many of you may remember that ADEM revised its monitoring strategy during 2005. It is comprised of several programs and our activities during January through March have focused on coordinating the activities associated with each of these programs into a comprehensive Monitoring Strategy. The 2007 Surface Water Quality Monitoring Plan was developed in February based sampling requested by our Nonpoint Source and 303(d)/TMDL Management Groups and the probabilistic selection of sampling locations based on watershed disturbance category and bioregion. This year, sampling is focused in the Black Warrior and Cahaba (BWC) River Basins. To date, samples have been collected during one-hundred and eighty site visits. A table summarizing the activities conducted in accordance with the Rivers and Streams Monitoring Program (RSMP) and the Rivers and Reservoirs Monitoring Program (RRMP) are summarized in the tables below.

Summary of Rivers and Streams Water Quality Monitoring Program activities, July-September, 2006.

Study	Station Visits	Chemical Samples ^a	Biological Assessments ^b	In situ Measurements ^c
Ambient Trend Monitoring	15	25	30	120
Reference	6	34	12	48
Targeted Monitoring (§303(d)/TMDL/UAA)	27	28	19	216
Clean Water Partnership Requests				
Probabilistic Basin Assessment	21	145	63	168
Special/Intensive Surveys	106	135	113	694
Total	175	367	237	1246

a. Chem. Assessments = Iced + Sulfuric + Nitric + Filtered Nitric + Dissolved Reactive Phosphorus + Ultimate BOD + Atrazine +
SW8141 and 8081A pesticides + 8270C Semi-volatiles + Metals.

- b. Biol. Assessments = Macroinvertebrate + Periphyton Chlorophyll a + Diatoms + Filamentous Algae + AGPT + Water Column Chlorophyll a + fecal coliforms+ Fish IBI.
- c. In situ measurements = (Habitat Assessment + Air Temp + H2O Temp + DO + Conduct. + pH + Turbidity+Flow) x # of station visits

Summary of Rivers and Reservoirs Water Quality Monitoring Program activities, July-September, 2006.

Study	Stations Sampled (Stations x Sampling Events)	Chemical Samples*	Biological Samples*	In situ Measurements**
Basin Intensive Survey				
Compliance Station				
Biennial Critical Period***				
303d				
Ambient Trend Monitoring	12	42	27	516
Special/Intensive Surveys				
Total	12	42	27	516

*Chem. samples/station = lced + acid + orthophosphorus. Duplicates and blanks included.

*Biol. samples/station = chlorophyll a + fecal coliforms + AGPT. Duplicates and blanks included.

**In situ measurements/station = (# profile measurements x parameters) + secchi + photometer + turbidity

***Biennial Critical Period = August only sampling

MISSISSIPPI PROGRAM HIGHLIGHTS

We from Mississippi are looking forward to this year's meeting. We hope to be well-represented and active participants in this year's annual meeting. Since the last newsletter, our work has focused largely upon gearing up for our ambient monitoring activities, collection of fish tissue, and response to spills to assess biological damage. Read below to learn more.

FIELD ACTIVITIES

Great Rivers EMAP coming to the Lower Mississippi

In the last newsletter, we outlined the 5 year plan for this project. Unfortunately, the funding for this project did not make it through congress, and it had to be dropped. We were looking forward to the opportunity to work with the other states and the USGS.

Non-wadeable Rivers and Streams IBI Development Study

All of the benthic samples collected during 2005 and 2006 have been processed. Taxonomy of the benthics is currently underway. Phytoplankton taxonomy began last year, and continues with the material sampled in 2006. All chemical analyses of water column samples collected during 2005 and 2006 have been completed. Due to Hurricane Katrina and the massive fish kills it brought to the Pascagoula River during 2005, the 22 sites scheduled to be sampled in this basin were sampled in 2006. In addition several sites from the Big Black and Tombigbee basins that were completed last year were re-sampled in 2006 in an effort to document any Katrina-based effects. It is our intention to develop a macroinvertebrate-based IBI as well as a phytoplankton-based IBI for assessment of the data.

Ambient Coastal Monitoring

This project was performed as per EPA's timeline and was completed in 2006. Currently MDEQ in an effort to sustain training and to preserve data collection from one year to the next will continue to collect a reduced version of this study (25 sites). In addition these yearly sampling collections will be part of the re-instated Ambient Monitoring Network.

Ambient Beach Monitoring

Sampling for MDEQ's ambient beach monitoring program has been re-instated and includes approximately 22 sites. Our contractor the University of Southern Mississippi - Gulf Coast Research Laboratory (USM-GCRL) has thankfully regrouped and is now a fully functioning facility in the aftermath of Katrina.

During recent weeks, there have been several beach closures issued. Current data and status of all beaches monitored in Mississippi can be seen at USM-GCRL's website, <http://www.usm.edu/gcrl/msbeach/index.cgi> or MDEQ's website, <http://www.deq.state.ms.us> and then follow the link to Beach Advisories.

Ambient Fecal Monitoring

Ambient fecal monitoring has also been re-instated and includes approximately 40 sites. Our contractors are currently collecting samples from primary recreational areas throughout the state.

Ambient Fixed Station Monitoring

Ambient fixed station monitoring will be re-instated beginning July 2007 and includes approximately 30 sites. Our contractors and regional office scientists will be collecting samples from bridges throughout the state.

Back Bay Storm Water Project

This project is a measure of pollution inputs into the Back Bay of Biloxi from storm water. It was another of our many efforts that had to be suspended after Katrina. It was reinstated in May 2006 to capture samples from the "contact period". It is currently underway and is anticipated to continue through December 2008.

TMDL and Waste Load Allocation Studies

Data collected for this project support Total Maximum Daily Load (TMDL) and Waste Load Allocation (WLA) development required by Section 303(d) of the Clean Water Act. These efforts provide data in corroboration of Total Maximum Daily Load (TMDL) and Waste Load Allocation (WLA) development and assessment of water quality impacts of point and non-point sources on dissolved oxygen (DO) in selected streams in Mississippi. Specifically, the data will be used to calibrate water quality models to evaluate dissolved oxygen levels and assimilative capacity in streams impaired due to low dissolved oxygen.

Development of the TMDLs will involve assessing existing data, conducting a field survey, selecting and calibrating a model, evaluating pollutant sources, and

formulating TMDLs, including a load allocation, waste load allocation, and margin of safety.

Led by Pete Howard, MDEQ personnel (assisted by contract staff and Regional Office staff) performed and will be conducting surveys of several sites identified by MDEQ as having potential water quality issues. MDEQ field biologists Brian Alford and Chip Bray worked on these intensive studies. Also assisting with various aspects of this work were Tony Cox, Jeffrey Estridge, Jeff Jones and Randy Jones from the MDEQ Regional Offices. MDEQ contractors who assisted were Christine Bertz, Charles Cockrell, Jeff Thomas, and Eleana Woodard.

Samples include ammonia nitrogen, 5-day BOD, ultimate BOD, total organic carbon, total Kjeldahl nitrogen, nitrate + nitrite nitrogen, total phosphorus, turbidity, and In-situ parameters. Additional measurements at selected sites include physical measurements of stream geomorphology, re-aeration, P/R Ratios, Sediment Oxygen Demand, and flow. These are conducted by personnel from the MDEQ Office of Land and Water Resources.

NATURAL RESOURCE DAMAGE ASSESSMENTS AND RESTORATION

Update on the Oil Spill in the Leaf River near Collins

Our staff continues to make periodic visits to the site to check on the progress of our restored stream. The US Fish and Wildlife Service, the Federal Trustee in the incident, has surveyed the Wood Duck boxes that were placed as a part of the restoration settlement. Their census indicates that usage of the nesting boxes is proceeding as expected, although some were knocked down or covered with debris from Hurricane Katrina.

Oil Spill in Middle Fork Creek near Baxterville

In February of this year, our biologists responded to an oil spill into Middle Fork Creek near Baxterville, Ms. This stream flows into Clear Creek and then into the Pearl River. An estimated 450 barrels of crude oil escaped from a broken pipeline and spilled into the stream. Approximately 1.5 miles of stream and stream bank were oiled. Biologists noted an oiled beaver, and an oiled wood duck. We also noted several robins on the shoreline during the clean-up activities. One of our major concerns was this spill and clean-up were occurring during the peak migration time for birds. We are analyzing chemical data collected during the spill at this time.

Train Derailment spills Chemicals into Meyers Creek

On March 8, 2007 eight cars from a train derailed in Forrest County, MS just south of Hattiesburg. Two of the cars that left the track ruptured, releasing liquefied sodium hydroxide and hydrochloric acid. About 40 homes near the derailment were evacuated for several days

The contents of the car containing sodium hydroxide were contained in a natural low area. The spilled hydrochloric acid ran down a ditch and into Myers Creek. This location is only a short distance above the confluence of Meyers Creek and the Leaf River. Emergency officials estimated that 15,000 gallons of HCl entered Myers creek. Early pH samples down stream of the spill showed a pH of 1.0. As part of the efforts to minimize the effects of the HCl, > 5,000 pounds of hydrated lime was dumped into the creek from downstream bridges to help neutralize the acid.

Fish mortality downstream of the spill to the Leaf River was 100%. MDEQ biologists were not allowed in the area until the next afternoon when the creek and the surrounding area were deemed safe. By then most of the fish carcasses had been washed downstream thus an accurate assessment of numbers and species was not determined. A study to assess the damage done to the fish population by the spill is being planned.

Fish Tissue Monitoring Program

Dioxin Monitoring for Leaf River Forest Products

As required in their NPDES permit, Leaf River Forest Products must collect fish tissue data every two years. MDEQ Biologists are contracted to do the collections and processing of these samples. MDEQ Biologists made these collections in March 2007. Fish tissue samples will be shipped to the contract lab for analysis for Dioxins and Furans.

Ambient Fish Tissue Monitoring

MDEQ continues to actively sample fish for ambient monitoring purposes. In previous years, a mixture of lake, river, and estuarine sites were sampled annually. The 2007 Ambient Fish Tissue Monitoring will focus on 25 lake sites. There are plans to sample 25 river sites in 2008 and 25 estuarine sites in 2009. In 2010, the rotation of sites will start again. Thus far in 2007, 10 Ambient Lake Sites have been sampled.

Steele Bayou Monitoring for DDT and Toxaphene

In March 2007, MDEQ Biologists sampled 3 sites on Steele Bayou for DDT and Toxaphene. The sampling was to provide additional data to Mississippi's Fish Advisory Task Force to see if the current consumption advisory on Steele Bayou is still warranted. The Task force has not met on this matter to date.

Congratulations and Kudos

To Fishery Biologist Al Gibson who recently completed the Department of Interior, Motorboat Operator Certification Course, Airboat Safety Module on April 2-3, 2007.

Last, but not least, a few words from Barb,

SWPBA Members,

What an honor and a surprise to be awarded "Biologist of the Year" by my fellow biologists from SWPBA. I was presented with the plaques by Mike Beiser at a recent staff meeting in Pearl, Mississippi. Talk of deceiving someone, nobody in Mississippi let on and I was caught completely off guard. After a little laughing and crying, I did accept the award and was speechless. I could have used a speaker to interpret for me. Chip, too bad you were in Georgia at the time of the presentation. I now understand why I was asked to attend this past meeting in Georgia. Unfortunately, I was presenting some work at a conflicting meeting in Belize City, Belize. Sorry, but I could not pass up a trip to Belize. I will admit, I missed seeing everyone at the meeting in Georgia. The SWPBA group is the best group of biologists that I have encountered in my 10 years with MDEQ. It means a lot to me to be honored with this award by my peers. However, I can do without the work caused by natural disasters. I hope to see all of you at the 2007 SWPBA meeting in South Carolina where I can thank you all personally.

Barbara Viskup

State of Georgia

Watershed Planning & Monitoring Program

First off, we want to welcome some new staff to our Program. Corey Babb joined the Ambient Monitoring Unit January 16, 2007. His previous employment was working as a chemist for the USDA Forest Service. Corey will be working on field chemical, physical and biological sampling and assessment of rivers and streams in Georgia. Cory will be working alongside Channing St. Aubin to perform the benthic assessment for the upcoming National Lakes Survey. Michael Weaver decided to make a mid-life career change recently earning a second Bachelor of Science Degree (this time in Environmental Studies). An environmentalist at heart, Michael joined the Intensive Surveys Unit after spending his early career in the military and law enforcement. Michael now gets to ride around in boats collecting samples and thinks he should be paying us for the pleasure.

Our congratulations to Liz Booth who was appointed to Program Manager over the Watershed Planning & Monitoring Program in December 2006. Liz replaces Mork Winn who can still be seen wandering our hallways working part time on special projects.

The Watershed Protection Branch of EPD has made some organizational changes during the past year. Five new Assistant Branch Chief's have been appointed to oversee issues arising with the five major river basin groups in Georgia. Linda MacGregor, Branch Chief for the Watershed Protection Branch will hopefully have some time now to concentrate on priority issues while the Assistant Branch Chief's are on the ground identifying issues that may or may not need her immediate attention. The following is a list of the new Assistant Branch Chief's and their river basin groups.

- Becky Chambers – Coosa, Tallapoosa and Tennessee River Basins
- Jeff Larson – Savannah and Ogeechee River Basins
- Tim Cash – Chattahoochee and Flint River Basins
- Kevin Farrell – Altamaha, Ocmulgee and Oconee River Basins
- Rob McDowall – Ochlockonee, Satilla, St. Marys and Suwannee River Basins

This year is starting off for a busy field season. One major sampling project on deck this year is an intensive sampling of Lake Lanier and the feeder tributaries to provide data for a nutrient model to be developed as part of the Total Maximum Daily Load requirements for the Lake. Also, as most states are doing, we're preparing for participation in the National Lakes Survey Project. This should pose a challenge for Georgia since 2 of the lakes targeted have significantly large shorelines making the 10 benthic sampling location visits a multi-day trip to accomplish.

The rotating river basin schedule has EPD returning to the Savannah and Ogeechee River Basins for our monitoring basins of focus in 2007. Our program had gotten off the rotating cycle while performing intensive sampling in the Coosa River Basin for development of a river model to determine dissolved oxygen concentrations at the Stateline between Georgia and Alabama. The sampling conducted during 2007 in the Savannah River Basin will aid in data collection to support the development of a Harbor model for dissolved oxygen in the Savannah Harbor. Work groups and committees have been formed and Georgia is working along with the USEPA, State of South Carolina, and the Georgia Ports Authority to develop an appropriate water quality standard for the Harbor.

Macroinvertebrate assessment methods and metrics development are on-going. The Ambient Monitoring Unit has been diligently working on updating the Standard Operating Procedures that should be posted on our Division's Web Site by the time of issuance of this Newsletter. The next field season beginning in September 2007 will find our "bug team" once again working on several projects. Along with fine tuning some southern ecoregion metrics for macroinvertebrate (if the drought ever ceases in South Georgia), we'll be working on some additional sampling projects this year. Some of the work being targeted is towards documenting "success" stories for Section 319 Grant projects. Macroinvertebrate assessments are being performed prior to start-up of grant related projects with a series of post remediation evaluations performed providing a measure of documented success to restoring the biological condition of the streams originally identified as impaired.

It's that time again to mention that Georgia is soliciting data for the 2008 305(b)/303(d) Listing Assessment and Report. If any bordering states have information they would like to share with Georgia for consideration in the 2008 List, please contact Susan Salter with the Ambient Monitoring Unit at susan_salter@dnr.state.ga.us . Any information available for consideration should be submitted to Susan Salter by June 30, 2007. As required, Georgia will be developing the 2008 List in the tiered format that will be a departure from earlier lists submitted to the USEPA by Georgia. There is always a new challenge out there for 305(b)/303(d) folks who are underappreciated for the efforts taken to consolidate the vast monitoring and assessment information into one document while keeping all the minute details fresh in their minds for the Total Maximum Daily Load Development group who want each data point accounted.

And, speaking of Total Maximum Daily Load (TMDL) modelers, Georgia's will be working non-stop from now until June 30, 2007 when their self-imposed deadline kicks in for the development of the next round of TMDLs. Any recently listed waters in the Coosa, Tallapoosa and Tennessee River Basins will be the next group to be developed on or prior to June 30, 2007.

After a very hectic 2006, Michele Brossett, 2006 President of SWPBA wishes all good things possible for the State of South Carolina and the next SWPBA meeting in 2007. We had fun planning and executing last year's meeting but are happy to turn over the torch to another state. Thanks again to South Carolina for stepping up and taking their turn early especially with NABS being held in Columbia, SC this year.

The Intensive Survey Unit is heavily involved with Standards Lake Monitoring as well as Basin Major Lake Monitoring for 2007. The usual list of Standards Lakes includes: Lanier, Allatoona, West Point, Jackson, Walter F. George (or Eufaula as it is called in Alabama), and Carters Lake. These lakes will be sampled monthly from April through October. The focus Basin Group for 2007 is the Savannah/Ogeechee Basin. This basin consists of 6 public lakes over 500 acres: Hartwell, Russell, Clarks Hill, Burton, Rabun, and Tugalo Lake. These lakes will be sampled quarterly. Chip Cutcliff and Mike Weaver will lead separate teams to try and stay on top of this aggressive lake sampling schedule.

The Intensive Survey, Ambient Monitoring and Facilities Monitoring Units are sharing a pool of hourly employees for the summer: Tela Dunagan, Tyler Parsons, David Dukes, and Robert Caldwell. We would not be able to accomplish our scheduled workload without their support and assistance. You may have the opportunity to meet them in the field this summer.

Alan Fizer, Intensive Survey Unit, is heading up Georgia's National Lake Survey study planning, and is coordinating his efforts with Channing St. Aubin and Corey Babb of the Ambient Monitoring Unit. This three-man team will be undertaking most, if not all, of the National Lakes Survey work July-September of 2007. Contact Alan at alan_fizer@dnr.state.ga.us for scheduling questions or for further information or contact Channing (channing_st_aubin@dnr.state.ga.us) or Corey (corey_babb@dnr.state.ga.us) for biological questions.

Linda Harn is heading up our fish tissue project and information booklet production. Any questions about the safety of eating fish in Georgia can be directed to her at Linda_Harn@dnr.state.ga.us. The 2006 booklet "Guidelines for Eating Fish From Georgia Waters" is currently available, with a 2007 update to be released later this summer. Also, the "Georgia 2007/2008 Sport Fishing Regulations" booklet is available. More information about it can be found at www.gofishgeorgia.com

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Carolina for stepping up and taking their turn early especially with NABS being held in Columbia, SC this year.

Everyone out there in SWPBA have a safe 2007-sampling season!

EPA Region 4, SEDS, Ecological Assessment Branch

Algal Growth Potential Tests (AGPT) and Chlorophyll a Analyses

Bob Quinn and Kay Millar have had a busy year processing AGPT and chlorophyll a samples from a variety of projects in 2006 and expect a busy year in 07 also. AGPT samples have been collected and processed for the EPA-ORD/Gulf Breeze Gulf of Mexico Hypoxia Study, and an in-house Blackwater Streams study. They are expecting samples from several NC lakes, GAEPD's Lake Lanier TMDL study, Chris Decker's periphyton study and several other projects for the Water Division this spring and summer. Finally, the lab purchased a high performance liquid chromatograph (HPLC) for chlorophyll/pigment analysis last year. The instrument is up and running, but additional parts are needed for low level work. The lab plans on doing some comparison work with chlorophyll samples received this summer and hope to be good to go later this year. For additional information, feel free to contact Bob or Kay at (706)355-8723/8707.

2007 SPNR Study (Southeastern Periphyton Nutrient Response)

This year, EPA-SESD is embarking on an effort to develop a methodology for sampling and analysis of periphyton from sand and sediment. Sand and sediment are major habitats in a large proportion of Region 4 streams. Historically, these habitats have not been addressed in periphyton investigations because of technical difficulties associated with sampling. Consequently, by avoiding them we have been overlooking one of the major habitat types available in Region 4 streams and possibly missing valuable insights into stream water quality. We are collecting a suite of long term and short term nutrient influenced parameters at a large number of sites within 75 miles of Athens, GA. The sites are distributed along a disturbance gradient based on the percentage of nutrient contributing land use activities within each watershed.

In addition, we are continuing to coordinate a multi-state and EPA collaborative effort begun in 2006 to explore and develop periphyton bioassessment within Region 4. This year participating agencies will collect nutrient and diatom community samples at 10 locations of their choosing. All of the data will add to the growing database of diatom occurrence, distribution and ecology. For additional information, contact Chris Decker at (706)355-8719.

Water Quality Surveys and TMDL Investigations

SESD has several water quality surveys planned for May, June and July 2007, including Escambia Bay near Pensacola (May), Florida, Yazoo2 near Grenada, Mississippi (June), and a survey of Lake Lanier near Gainesville, Georgia (July). Biological Oxygen Demand (BOD) samples were collected from the Savannah River earlier in the month and several staff members participated in the Cape

Canaveral Ocean Dredged Material Disposal Site (ODMDS) and the Central Florida Reference Evaluation (CFLARE) surveys aboard the EPA Ocean Survey Vessel (OSV) Bold in March. Another status and trends survey aboard the Bold is planned near Miami, Florida in October. For additional information, please contact John Deatruck at (706)355-8774.

The “Living Stream”

In an effort to promote water and natural resource stewardship throughout the region, the US EPA, Region 4 staff designed a The Living Stream,®. This demonstration is used to educate children about the benefits of healthy streams and the need for clean water. The Science and Ecosystem Support Division staff from Athens, GA, educate students about the organisms found in healthy streams and encourage them to search for aquatic insects which have been placed in the stream. Over 4000 students and adults have participated in this event, which demonstrates the concern Georgia citizens have for our water resources and the importance of educating children and teachers about this valuable natural resource. For more information, contact Lonnie Dorn at (706)355-8683.

Other news: John Deatruck is the acting Section Chief of the Ecological Evaluation Section and Bill Cosgrove has been promoted as the acting Branch Chief of the Ecological Assessment Branch for a 1-year detail.

Finally, we are planning to send 5-7 of the usual crowd from SESD to the meeting this year. Can't wait to see you all in November @ Folly Beach. Until then, Mo Flexner (706)355-8713

