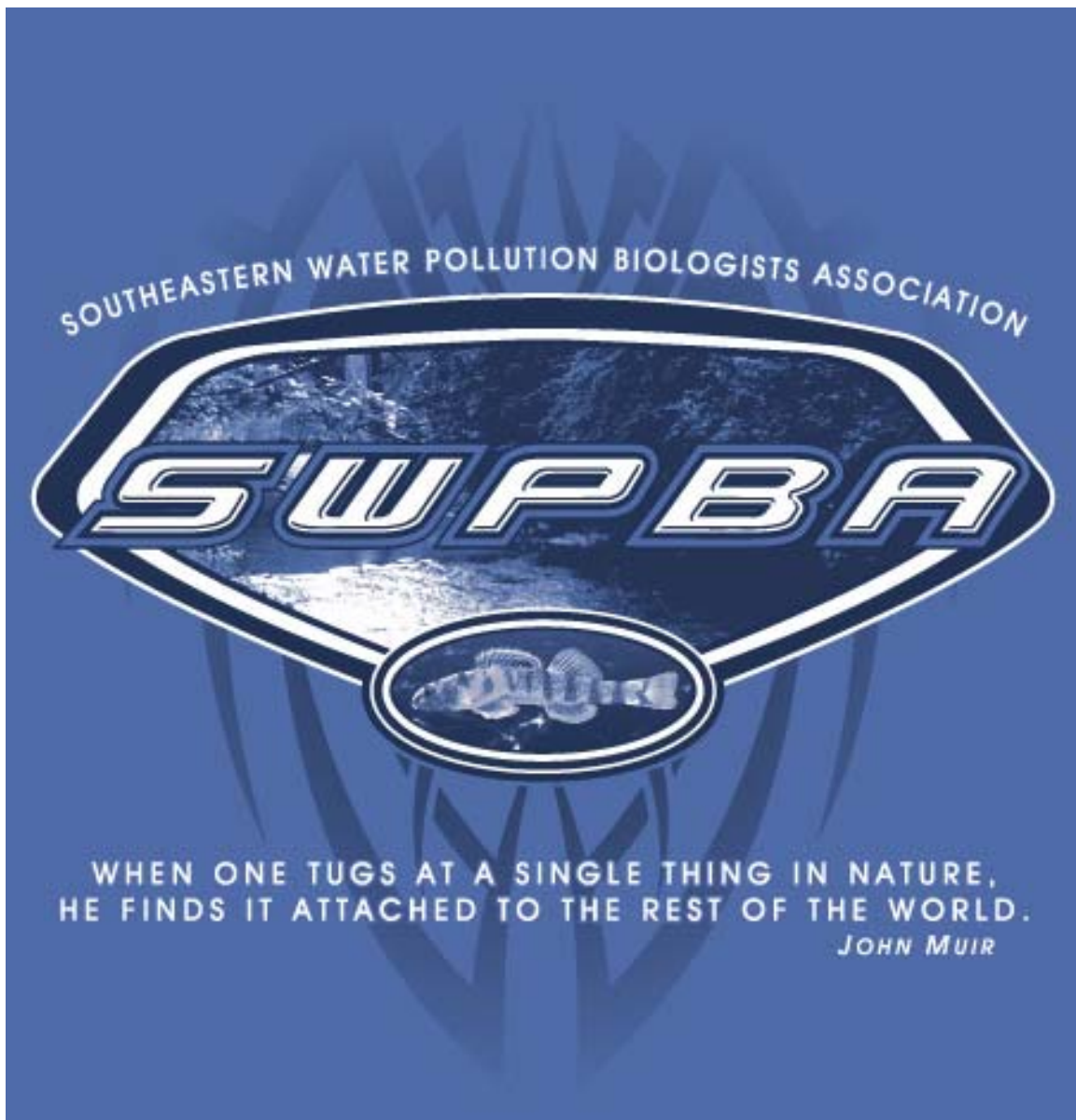


**Southeastern Water Pollution  
Biologists Association  
2004 Summer Newsletter**



**AUGUST 2004**

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Unfortunately due to time constraints and busy schedules, Georgia and South Carolina updates not available at this time.

## Presidents Letter

Hello!

If everyone has been as busy as we have, you will excuse the lateness of this newsletter. We look forward to slowing down and seeing everyone at the SWPBA meeting on November 2-4, 2004 in Orange Beach, AL. Unfortunately I will be unable to attend the meeting this year but hopefully you will all have some fun for me (I know I'm a wimp, but at 8.9 months pregnant I'll sit this one out). I pass the reigns as President to Lisa Huff, with Michael Stowe stepping in as Secretary.

To a great SWPBA meeting! Janet Branch

The SWPBA meeting is just nine weeks away and I have unexpectedly been promoted to President. There are two reasons why these facts are not as distressing as they should be. First, we are fortunate here at ADEM (me especially) that Janet had the fore sight to start working on the 2004 SWPBA meeting right after we returned from the 2003 SWPBA meeting. Second, Mike and the rest of our folks here at ADEM have been more than willing to help plan and organize all aspects of the upcoming meeting.

Region IV has lost a wealth of taxonomic and field expertise in the last few years. Additionally, budget crunches across Region IV have prevented many of our biologists from attending some of the national meetings where emerging issues in biological monitoring and bioassessment have been discussed by the most knowledgeable people in the field. For that reason, several sessions will focus on methods and program development to get an idea of why we use the methods we use, how they were developed, what we've achieved, and what still needs to be addressed. Several presentation slots are still open. Also, because so many of our SWPBA members are new, the meeting includes a "Poster Social" to encourage people to present old and new posters, especially those dealing with methods and method development. Presenters are asked to submit an abstract a few weeks prior to the meeting so that they can be included with the meeting agenda.

We are also asking people to mail in their pre-registration forms and checks. If you are unable to attend at the last minute, all registration/banquet fees paid will be refunded to you. By sending us a check ahead of time we will have a better idea of our financial outlook.

We are trying to completely update the SWPBA database before the meeting. Please review your states member listing included with the newsletter to correct any names, addresses or phone numbers and to add any new members. We will have an up-to-date member listing for all meeting attendees.

Also, don't forget to vote absentee in the presidential election (Nov. 2).

If you have any questions or comments, please feel free to contact me at (334) 260-2752 or [esh@adem.state.al.us](mailto:esh@adem.state.al.us)

It should be a great meeting. Hope to see you there! Lisa Huff

2004 ANNUAL MEETING OF THE  
***Southeastern Water Pollution Biologists Association***

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Orange Beach, AL November 1-4, 2004

## REGISTRATION FORM

Name:	
Agency:	
Address:	
City, State, Zip:	
Phone:	
Email:	

Registration Fee:	Qty:	@ \$40.00	= \$	
Banquet:	Qty:	@ \$26.00	= \$	
T-Shirts:	Qty:	@ \$10.00	= \$	
T-Shirts (XXL):	Qty:	@ \$11.00	= \$	
Total \$				

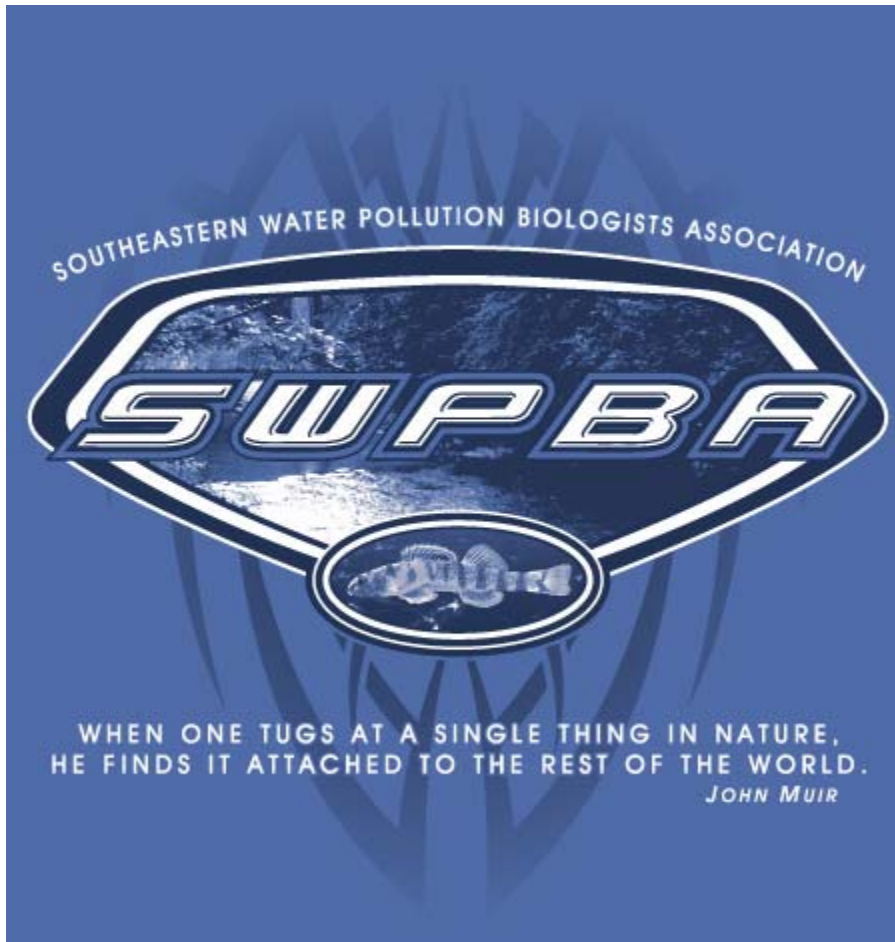
Make checks payable to SWPBA c/o Vanessa Pruitt

### T-Shirts (size and color choices)

T-Shirt Color	Size	Quantity Ordered
Medium Blue	S	
	M	
	L	
	XL	
	XXL	
Sage Green	S	
	M	
	L	
	XL	
	XXL	

# SWPBA T-SHIRTS

Prepaid orders are required for T-shirts. Please submit your t-shirt order using the registration form provided by October 15, 2004 (We must have a final count by that day, so if you get it in the mail late, call and let us know it is coming)



Back design

The front will have the SWPBA logo on the left pocket area (but the t-shirts do not have pockets)



Color selections are a medium blue or sage green

Sizes available:  
S  
M  
L  
XL  
XXL (extra cost)

# SWPBA ABSTRACT FORMS

If you have any questions or problems, call Lisa Huff at (334)260-2752.

Don't forget to complete the equipment sections so we will be able to plan for all requirements.

<b>NAME OF PAPER</b> <b>title continued</b>	
Presenters	
State or Department Name	
Please leave this section blank	
ABSTRACT  This section is formatted to 10 point type that will allow a 12 line description (175 - 200 words).	
TYPE OF PRESENTATION:    _____ Oral    _____ Poster Session	
LIST EQUIPMENT REQUIRED  _____ Slide Projector  _____ Overhead Projector  _____ 98 Powerpoint Presentation  _____ XP Powerpoint Presentation	OTHER SPECIAL REQUIREMENTS:

SWPBA Meeting Agenda  
November 1-4, 2004

	Monday		Tuesday		Wednesday		Thursday		
8:00-8:20	Macroinvertebrate Assessment Comparison Study: AL, NC, SC, MS, FL, GA, EMAP, EPA		Registration/ Poster Set up	Welcome/Introductions		TALU/Biocriteria/ IndexDevelopment		Wetland/LgRiver Assessments	
8:20-8:40				EcologicalAssessments					
8:40-9:00									
9:00-9:20				Break					
9:20-9:40				EcologicalAssessments		HDG's/GIS Tools for predicting impairment		Wetland/LgRiver Assessments	
9:40-10:00									
10:00-10:20								Overall Assessment of Water Quality: EMAP and other approaches	
10:20-10:40									
10:40-11:00									
11:00-1:00	Lunch						Adjourn		
1:00-1:20	Macroinvertebrate Assessment Comparison Study: AL, NC, SC, MS, FL, GA, EMAP, EPA	HDG Workshop	Overall Assessment of Water Quality: EMAP and other approaches			Nutrient/ Sediment Indicators and Criteria			
1:20-1:40			Break						
1:40-2:00			ComparisonQA/QCMethodsSummary--Jerry Diamond			Break			
2:00-2:20			ComparisonQA/QCMethodsDiscussion			EcologicalAssessments			
2:20-2:40									
2:40-3:00									
3:00-3:20					Announcements			Announcements	
3:20-3:30	Adjourn				Adjourn				
3:30									
3:30-4:30									
5:00-7:00	Posters Session				6:00-8:00 Banquet				
7:00-9:00	Registration/Poster Set-up/ECM		Social						



December 16, 2003

Ms. Janet Branch  
SWPBA  
1890 Cong. Dickinson Drive  
Montgomery, AL 36109

Dear Ms. Branch:

Thank you for choosing the **Hilton Garden Inn** for your groups accommodations in November 2004. A block of rooms have been reserved in the name of your group for Oct. 31 ~ Nov 3, 2004:

**Southeastern Water Pollution Biologist Association**

*Please include the following information in all correspondence to your members.*

Your room rates are as follows:

(2) *Queens Poolside:* \$64.95 (Per night/Plus 11% tax)\*\*15 blocked  
(2) *Queens Beach View:* \$64.95 (Per night/Plus 11% tax)\*\*15 blocked

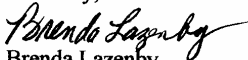
Guests must call Hilton Direct at (800) 445-8667 to make reservations. They should identify themselves as part of the group and specify the group code : SWP

Reservations must be made no later than October 15, 2004 in order to receive the group rates. *Any reservations made after this date will be on a space available basis at regular rack rate.*

Individuals will need to guarantee their reservations with a credit card or first night's deposit at the time the reservation is made. Individual cancellations must be made **48 hours prior** to the arrival date or the guest will be billed the first night room and tax.

If any questions or problems making your reservation, please do not hesitate to call me.

Sincerely,

  
Brenda Lazenby  
Director of Sales



REMINDER

November 2<sup>nd</sup> is Election Day

Don't forget to absentee vote if you'll be at  
the SWPBA meeting!!

## **News from Alabama**

### ***Reservoir Water Quality Monitoring (RWQM) Program***

Compilation and analysis of data was completed and draft reports initiated for the following projects: Tributary Embayment Water Quality Assessment of the Tennessee River Basin; Water Quality Assessment of Alabama Reservoirs for Nutrient Criteria and Total Maximum Daily Load Development; and Nutrient Criteria Compliance Monitoring of Alabama Reservoirs. A total of 80 stations were monitored for these projects each month, April-October 2003, with vertical profiles of in situ variables conducted at meter intervals and composite samples collected for nutrient and chlorophyll a analyses. Protocol development and sample scheduling has been completed for the project Southeast Alabama Rivers and Reservoirs Water Quality Assessment, Water Quality Assessment of Alabama Reservoirs for Nutrient Criteria and Total Maximum Daily Load Development, and Nutrient Criteria Compliance Monitoring of Alabama Reservoirs. Reconnaissance of sampling sites was completed in April 2004. Monthly sampling, April-October, is currently conducted at 32 Southeast Alabama River, reservoir, and tributary embayment sites, with 21 sites sampled in other basins at the same frequency for nutrient criteria and/or TMDL development. Sampling for compliance monitoring of Harris and Martin Reservoirs for established lake-specific nutrient criteria is also being conducted, April-October, at 9 sites on these reservoirs. Protocol development and sample scheduling has been completed for the critical period (August) monitoring of Dannelly, Claiborne, Woodruff, Weiss, Neely Henry, Lay, Yates, and Thurlow reservoirs in accordance with the two-year monitoring rotation of all lakes in the state. Long-term critical period and growing season graphs were updated with 2003 RWQM data and available for departmental use. Water column dissolved oxygen graphs were also created to get a more accurate view of current reservoir conditions, indicating the percent of the water column below 2 mg/l. For more information on this project contact Gina LoGiudice at [glogiudice@adem.state.al.us](mailto:glogiudice@adem.state.al.us) or 334-260-2783.

### ***Fish Tissue Monitoring Program***

A total of 522 fish (12 species) were collected from 50 locations in 21 waterbodies across Alabama during the fall of 2003. Of the 522 fish, 472 were collected as part of the ADEM Fish Tissue Monitoring Program (FTMP) and 50 were collected as part of the Department's participation in the U.S.EPA National Fish Tissue Study. Site Assessments were conducted by the ADEM/Land Division for the FTMP in which 11 fish were collected from one site on Lake Martin and 12 fish were collected on the Alabama River near Montgomery. Funds provided by the Alabama Department of Public Health (ADPH) were used to collect 24 fish from two sites on the lower Tombigbee

River. Data packets consisting of complete data spreadsheets, exceedance spreadsheets, quick reference spreadsheets (of FDA exceedance locations), and maps of sampling locations were provided to program cooperators and a press release was written and provided to ADEM/Public Affairs for review and release. Requests for FTMP data and information were received from multiple agencies and private citizens. Staff visited ADCNR Marine Resources Division for training in methods of aging marine fishes. For more information on this project contact Michael Len at [mlen@adem.state.al.us](mailto:mlen@adem.state.al.us) or 334-260-2700.

### ***303(d) Water Quality Assessment Program***

FY04 303(d) water quality assessments began in March. These data will be used in support of listing and de-listing decisions, use attainability analyses and TMDL development. Ecoregional Reference Reaches, also being assessed as part of this effort, are used in the development of baseline water quality values for TMDL development. Some Field Operations staff completed site reconnaissance and began sampling in February to get a head start on the busy year. Personnel from the Montgomery, Mobile, Birmingham, and Decatur field offices are working together to sample 165 stations. These stations are located mainly in sub-ecoregions of the Choctawhatchee, Chattahoochee, Cahaba, and Tennessee basins with other stations located in various other sub-ecoregions around the state. These stations will be sampled from March to October. Of these stations, 40 are part of the Ecoregional Reference Reach Program and will be assessed from March to November. Water quality parameters include measurements of organic enrichment, total recoverable and dissolved metals, fecal coliform and water column Chlorophyll-a. Intensive fecal studies are being conducted at 34 stations during the June to September time period. For more information on this project contact Ransom Williams Jr. at [rw@adem.state.al.us](mailto:rw@adem.state.al.us) or 334-260-2715.

### ***Ecoregional Reference Reach Program***

This year, as in previous, we are accomplishing our statewide water quality sampling as a joint effort with the three other field offices. This includes sampling efforts at sites for TMDL development/listing/delisting as well as designated reference reaches across the State. Monthly water quality sampling events and one time intensive fish and/or macroinvertebrate community assessments have been conducted at reference

reaches that are located in ecoregions found within our targeted annual river basin-group (5 year rotating basin approach). This year's Basin focus is what we call the Southeast Alabama (SEAL) Basins that include the Chattahoochee, Choctawhatchee, Pea, Perdido-Escambia, Yellow, and Blackwater river basins. In addition, a number of sites in the Tennessee Basin were assessed to augment the dataset from that part of the State. During FY04, 37 Ecoregional Reference Reaches are being assessed monthly from February to November. Water quality parameters include indicators of sedimentation and nutrient enrichment, metals (dissolved and total recoverable), fecal coliform, and an Atrazine screen by Immunoassay (March and April only). Habitat assessments and reach characterization are being conducted once during April/May and July/August. For more information on this project contact Vickie Hulcher at [vjh@adem.state.al.us](mailto:vjh@adem.state.al.us) or 334-260-2702.

### ***Fish Community IBI Assessments***

Fish community Index of Biotic Integrity assessments were conducted at 54 stations as part of the FY 03 Tennessee River Basin NPS Assessment and our Ecoregional Reference Reach Program. This included sampling in five level III ecoregions. Identification of all fish is complete and analysis of metric scoring is underway. Eighty-two species were collected, 27 of which are new to the Department's reference collection. Selection of sites for FY 04 sampling is pending macroinvertebrate identification/analysis from NPS Assessments in SE Alabama River basins. Approximately 60 stations are anticipated for IBI assessment. For more information on this project contact Lee Davis at [mld@adem.state.al.us](mailto:mld@adem.state.al.us) or 334-260-2700.

### ***Periphyton Assessments***

Three periphyton bioassessment methods (periphyton biomass as chlorophyll a, diatom community assessment, and a field-based rapid periphyton survey) were tested at 20 stream segments with known or suspected impairment caused by nutrient enrichment. The methods were also tested at 14 ecoregional reference sites for comparison. Training in sample collection and taxonomy was an integral part of the project. To provide the most complete characterization of water quality conditions, habitat quality and the macroinvertebrate and fish communities were also assessed at the reference and study reaches. Water quality data was also collected. Pearson correlation coefficients showed significant relationships between several biological metrics and nutrient parameters. A final report will be completed by August 30, 2004. For more information on this project contact Lisa Huff at [esh@adem.state.al.us](mailto:esh@adem.state.al.us) or 334-260-2752.

### ***Microbiological Program***

The micro-lab has been on its toes this year with plenty of fecal coliforms to go around. The majority of these samples result from routine studies on §303d and reference condition streams, compliance sampling inspections (CSI) and other special studies. A light at the end of the paper tunnel has risen! We are now reporting our colony count results into the Laboratory Information Management System (LIMS). This new micro result reporting system has been implemented for several months now and has been critical in increasing essential communication between the micro-lab, Central Laboratory and sample collectors. The process continues to undergo review, troubleshooting, and refinement of the data quality assurance procedures. For more information on the Microbiology Program contact Marion Bertolotti at [msb@adem.state.al.us](mailto:msb@adem.state.al.us) or 334-260-2710.

### ***Bioassay Program***

The Bioassay Unit is conducting a total of 14 chronic compliance toxicity tests and 7 acute tests of NPDES permittees during FY05. Several of the chronic tests are being conducted as definitives to provide additional data to the engineers for stream upgrades. In addition, 1,083 Compliance self-monitoring reports were received and reviewed from 579 facilities with comments provided to the Water Division. Compliance testing for the Montgomery Toxicity Unit typically begins in mid August and runs through mid October, however, the 2005 season was moved up to begin in July so toxicity staff would have the opportunity to attend SWPBA. For additional information on the Bioassay Program contact Marion Bertolotti at [msb@adem.state.al.us](mailto:msb@adem.state.al.us) or 334-260-2748.

### ***Ambient Monitoring Program***

*ALAMAP*- Sixty stations are randomly selected by EPA for monitoring each season, and the FY 04 sampling is currently underway. Monitoring is conducted in August during low flow conditions. Sampling includes field parameters, water quality parameters, and a habitat assessment and physical characterization the station. Information from previous sampling was included in the 2004 Alabama 305(b) Water Quality Report to Congress for the first time in the program's history. For more information on this project contact Lee Davis at [mld@adem.state.al.us](mailto:mld@adem.state.al.us) or 334-260-2700.

### ***Emergency Response***

The ADEM-Emergency Response Team provides 24-hour emergency response support to local governments in response to actual or potential releases of oil and hazardous material. The ADEM-ERT serves as the State on-scene coordinator for hazardous material releases to the waters of the State, and also acts as the technical advisory agency in identifying and directing the containment, treatment, and removal of hazardous materials impacting or threatening citizens and/or the environment. Response is conducted through the four Field Operations branch offices located in Montgomery, Mobile, Birmingham and Decatur. There have been 68 water related responses by the ADEM-ERT from the beginning of this calendar year through July. These responses have mostly involved the release of petroleum products to surface water but have also consisted of releases of Sulfuric and Hydrochloric acids, Sodium Hydroxide, Hydrogen Peroxide, Ammonia, Biphenyl, and Xylenes. For more information on this project contact Jerry Cheatwood at 334-260-2712 or [jwc@adem.state.al.us](mailto:jwc@adem.state.al.us)

### ***Data Management/Storage***

Development of the Department's Surface Water Quality Database (SWQD) is nearing completion. User testing is underway to assure appropriate and accurate function. An initial test export from the Department's LIMS systems was successful. A test export to STORET was run through the EPA provided validation programs and was determined to be "acceptable". However, additional review of the data exported to the STORET client is underway to assure correct mapping of data fields. Efforts are concurrently underway to develop methods for importing historical ACCESS database data into the SWQD for subsequent reporting to EPA. For more information on this project contact Vickie Hulcher at [vjh@adem.state.al.us](mailto:vjh@adem.state.al.us) or 334-260-2700.

## ***Update from Florida***

### **Central District**

FDEP's Central District personnel are busy sampling TMDL-listed waters within the Kissimmee River basin to determine whether they should remain on the verified list of TMDL waterbodies. Almost 250 stations within numerous water body segments are being sampled for water chemistry parameters (many repeatedly), along with about 20 accompanying bioassessments. This large area, located south of Orlando, serves as the headwaters of Florida's Everglades.

In cooperation with the department's Ambient Monitoring group in Tallahassee and St. Johns River Water Management District, Central District biologists have also been carrying out Floristic Quality Index (FQI) assessments on a number of small lakes in the Ocklawaha River drainage. Each FDEP district will sample 30 of these small lakes and wetlands, which were chosen randomly from those occupying a given drainage basin. This procedure, which is still in development, uses the makeup of the aquatic and wetland macrophyte community as an indicator of system health.

The introduction of the invasive exotic apple snail *Pomacea canaliculata* into a 285-acre lake in Seminole County near Orlando has caught the attention of various government agencies and citizens groups. FDEP and Seminole County personnel found the very large snails (up to 100mm in length), and bright pink egg masses in huge numbers in Lake Brantley in late June. Originating in South America, these impressive relatives of the native Florida apple snail (*Pomacea paludosa*) consume virtually any type of aquatic plant, reproduce quickly and in large numbers, and have few or no biological controls in Florida. The extent of the damage they may cause is not yet known. Of particular concern are the effects they might have on the nearby Wekiva River, one of Florida's two Wild and Scenic Rivers, and an important center of biodiversity in Central Florida. A fact sheet is being distributed to lakeside homeowner associations and other potentially-affected parties. (For more information, contact Dana Denson at [dana.denson@dep.state.fl.us](mailto:dana.denson@dep.state.fl.us).)

Of interest to those curious people who like worms, Eric Pluchino has run across the naidid *Ripistes parasita* in a lake sample from Orlando. This really fascinating (as worms go) oligochaete lives in a tube and has enormously elongate setae that it sticks out of its tube in a way not unlike some marine polychaetes. Eric is working with Mark Wetzel of the Illinois Natural History Museum to study the ecology of this organism.

### **Northwest District**

District staff sampled the following during the past year: 32 BioRecons, 55 SCIs, and 14 lake samples. Following sampling, twenty-two ecosummaries were written and published on the FDEP website: <http://www.dep.state.fl.us/water/bioassess/ecosums.htm>.

Meetings on water pollution in Lake Martin, Lake Powell, and fertilization of impoundments by the Florida Freshwater Conservation Commission were attended as

well as review meetings for State Lands. Staff also participated in the Eglin Working Group for Ecological Aquatics Management Meeting.

Don Ray and Hoke Howard of EPA Region IV recently returned from a week in Guatemala where they trained 25 Central American Biologists to perform rapid bioassessments protocol in high and low gradient wadeable streams.

### **Southeast District**

- Case for Impairment Classification of Biscayne Bay including macroinvertebrate community study.
- CERP Baseline water quality and biological monitoring in Indian River Lagoon, Lake Worth Lagoon and Ten Mile Creek.
- TMDL monitoring for Group 5 and various other waterbody segments with data needs.
- Development of a plan to investigate and show impairment of Coastal waterbody segments due to nutrient enrichment.
- Investigation of copper discharges from managed stormwater ponds.
- Habitat survey of lakes in the southeast district.
- Laboratory NELAC certification.
- Design of STAs to treat Biscayne Bay stormwater influent.
- Monitoring and reporting of water quality in Grassy Waters and Corbett Wildlife Management areas.
- TMDL planning and implementation goals.

### **Southwest District**

Staff from the Southwest District Watershed and Resource Management Program are currently conducting a National Oceanic and Atmospheric Administration (NOAA) funded remote sensing project. The purpose of the study is to utilize aerial imagery to assess water quality, hydrologic conditions and vegetation. The multispectral airborne imagery will be obtained through the use of a Compact Airborne Spectrographic Imager (CASI), which will be mounted on an aircraft.

Total Maximum Daily Loads. The Southwest District is busy monitoring water bodies for the TMDL program. Water quality monitoring is being performed for the following:

- Withlacoochee River Basin (19 wbids, 67 sites)
- Springs Coast basin (18 wbids, 92 sites)

Biological assessments are being performed in the same basins (8 wbids, 20 sites).

In addition, an intensive monitoring study is ongoing in the Myakka River to determine site-specific alternative criteria for dissolved dissolved oxygen. Water quality is tested monthly for discrete and continuous parameters, and biological assessments are done quarterly at eight sites in 5 sub-basins. This is the second year of this study.



Point Source Biological Monitoring. Several big permit issues required biological assessment. These included:

- Piney Point Phosphate, Inc, holding water discharge into Bishop Harbor.
- Coronet Industries site investigation
- Illegal dredging activity in Sarasota Bay

Ambient Biocriteria Development. Sampling continues at our ambient reference to provide continuing data for the development of State Biocriteria in streams, rivers and lakes.

Aquatic vegetative surveys were conducted on 10 lakes in 2003, providing data for the development of the statewide Floristic Quality Index, and 30 additional lakes will be sampled in the summer of 2004

## **Bureau of Laboratories**

### Stream Condition Index Recalibration

The SCI is routinely used by the TMDL program, ambient monitoring, NPDES permitting, and for studies involving restoration success determination. Florida recently recalibrated its SCI across the Human Disturbance Gradient (Leska Fore 2004). Ten metrics are calculated, including total taxa richness, the number of Florida sensitive taxa (which includes all Plecopterans), the number of Ephemeropterans, the number of Trichopterans, the number of clingers, the % dominant taxon, the % Tanytarsini, the % very tolerant taxa, the % filter-feeders, and the number of long-lived taxa (life cycle of one year or greater).

Five of the metrics have the same expectations throughout the state, but the other 5 metrics have different expectations in Florida's 3 bioregions (panhandle, peninsula, northeast). The SOPs for sampling and index calculation are available at:

<http://www.dep.state.fl.us/labs/qa/sops.htm>

The complete SCI report may be found at: <http://www.dep.state.fl.us/labs/sop/index.htm>

## **Office of Beaches and Wetland Resources**

### Effects of the Organic Detrital Removal on Water Quality and Fish

FDEP in coordination with the Florida Fish and Wildlife Conservation Commission, are preparing a report evaluating the effect of organic detrital removal on water quality and fish. To date, the use has been limited to Lake Weir, in Marion County, Florida. Water quality sampling has been completed, including benthic

macroinvertebrate and fish analyses, and the report is in the early phases of preparation.

## KENTUCKY DIVISION OF WATER

Terry Paul Anderson retired on July 30 after nearly 26 years with the Kentucky Division of Water. Terry served as supervisor of the Standards and Specifications Section for 10 years and then as Branch Manager of the Water Quality Branch also for 10 years. Terry is a native of Washington, served in the Peace Corps in Ghana as a biology teacher in the late '60s, and received his M.S. and worked for 5 years at University of North Carolina - Chapel Hill in the School of Public Health. He joined the KDOW in 1978 and initiated the lake studies (through Clean Lakes grants) that continue to this day, and he helped push through the basic structure of KY's water quality standards that also remain to this day. Terry's knowledge, experience, and comradeship will be irreplaceable. Future plans include travel to see his dad in Washington, attend the NALMS conference in Victoria BC, fish, backpack, and generally try and spend all his well-earned retirement checks.

After 25 years of service to the Commonwealth (actually it is 26, but he didn't do a whole lot of work last year), Skip Call has announced his retirement from the Kentucky Division of Water effective July 30, 2004. He has been an advocate for the use of biological assemblages, especially macroinvertebrates, as biological indicators. Skip has also been a leader in issue of aquatic biologist certification both regionally and nationally. His knowledge of macroinvertebrate taxonomy and ecology is extensive. In 1999, he was elected SWPBA president and has been a representative on the SWPBA Executive Committee on several occasions. Life in the field and at the lab will not be the same. His retirement will leave a giant void at the Kentucky Division of Water that cannot be replaced. Good luck in the retirement, Skip!



## ECOLOGICAL SUPPORT SECTION

Kentucky has been under siege this year. When will the rain stop? Despite the wet weather, the sampling season is in full gear. Biologists have been concentrating on the Licking and Salt River Basins this year. With Greg's promotion to supervisor, Skip's departure, and a hiring freeze, we're getting pretty thin in the macroinvertebrate scheme of things. Fishmongers and scum scrapers now have to collect fish food organisms in addition to their own field duties. Identification will be conducted by an unknown someone at some unknown time in the future. During August (if the rain lets up), biologists will be conducting mussel bed surveys in the Salt River drainage and large river sampling of the Green River. Water quality monitoring continues at our Wild Rivers. Fecal coliform monitoring of the Upper Cumberland River and the North Fork Kentucky River, as well as watershed ambient sites, also continues on target.

## NONPOINT SOURCE SECTION

The Nonpoint Source biologist staff has now been cut in half. The biologist that decided to leave the Division of Water and go to the Transportation Cabinet has now taken a position with the Missouri Department of Conservation. Steve McMurray will head up the freshwater mussel program in Missouri. Congratulations to Steve and the best of luck! The other half of the team will beg, borrow, or steal field assistance in order to get things done until the "hiring freeze" is lifted. Below is a summary of the status of our current projects:

- *Green River Basin Monitoring and Assessment:* A rough draft has been completed.
- *Evaluation of the Obion Creek Corridor Restoration Demonstration Project:* A pre-bmp report has been completed and is the final stages of publication. Post-BMP monitoring is on going.
- *Evaluation of the Wilson Creek Restoration Project:* Completed post-restoration monitoring fieldwork during March and July 2004 and monitoring is scheduled for September 2004 and 2005. We are currently working on fish and macroinvertebrate identifications.
- *Salt & Licking River Basin Management Unit Monitoring and Assessment:* Due to the monitoring staff being cut in half, we will only concentrate on the Licking River Basin. We have randomly selected 20 of 63 14-digit HUCs for monitoring, with fish and macroinvertebrate sampling to occur at the downstream reach of each HUC. Sampling has been completed on all but few sites.

## TMDL SECTION

In its second year of existence, the TMDL Section has been successful in fine-tuning the program. Late last year we finally acquired a section supervisor, Johnny Gonzales. At the end of July we also filled a coordinator position. Lisa Hicks will be working on our watershed sampling plans and updating our QA/QC program and SOP manual.

The TMDL Section is currently keeping busy with water quality monitoring, TMDL reviews, and specific TMDL modeling / monitoring training. This year the two biologists of the section have been busy collecting macroinvertebrates and algae samples for spring and summer RBP monitoring. They have also been conducting monthly water chemistry sampling at 65 sites within the Salt River and Licking River watersheds. The two modelers are busy reviewing TMDL's, receiving training, and are starting to get geared up to write their own TMDL.

The section is looking to increase activity in developing relationships with potential third party consultants. We anticipate that this year will be a continued growth year in key areas of TMDL development yielding higher level of productivity and success.

401 CERTIFICATION and STANDARDS AND SPECIFICATIONS are busy and short-handed (like the rest of us), so they will not be contributing to the newsletter this time, but they promise to do better next time around.

# MISSISSIPPI HAPPENINGS

It has been an atypical summer here in Mississippi. Lots of rain in June, and then the summer heat came all at once in July. We have completed the sub-sampling of our benthic samples, and identifications are well on their way. We began lake monitoring for nutrient criteria development in March, and have continued with this study in June and July. We will conclude in November. We have also been busy collecting fish for tissue analysis, and NCA is scheduled to begin in a couple of days. There are a whole bunch of other things looming on our horizon. All of us from Mississippi DEQ are already looking forward to Orange Beach. We have also found time to begin making plans for our hosting of SWPBA 2005. The location will be on the Mississippi Gulf Coast. By the time the annual SWPBA meeting rolls around, we should have all of the arrangements made, and will provide the membership attending the annual meeting with an overview of the 2005 meeting.

## **Another New Face and a Big Change**

We wish to introduce and welcome another new member to SWPBA. Valerie Alley received a B. S. in biology from the University of North Alabama in Dec of 1999 and a M. S. degree from the University of Louisiana at Monroe in biology in August of 2004. Her thesis was titled "Analysis of benthic macroinvertebrate associations in low gradient streams of the Kisatchie National Forest (Central Louisiana, USA)". Prior to joining MDEQ, she worked as a student contractor for the Aquatic Ecology and Invasive Species Branch in the Environmental Lab of Waterways Experiment Station, part of the US Army Corps of Engineers, on the invertebrate team. She joined the staff of MDEQ in April of 2004 as an Environmental Scientist in the laboratory in Pearl MS. During this time she has been involved in the QA/QC of benthic invertebrate samples, invertebrate taxonomy, and the lake nutrient program. **Welcome Valerie!**

After over a decade of service to the Biology Section as a toxicologist, Doug Upton has been promoted to Quality Assurance Manager for the MDEQ Field Services Division. Doug is most deserving of this promotion, and although he has re-located his office, he will still be working with us on a daily basis. **Congratulations Doug!**

## **Field Activities**

As we have been involved in numerous studies of a long-term nature, our field activities have changed little since the last SWPBA Newsletter.

### **National Coastal Assessment**

David Barnes, Emily Cotton, and Barb Viskup will again represent the Biological Services Section during this sampling effort. Samples will be collected during August and September. Fifty sites throughout the Mississippi Sound are scheduled for sampling, with benthos, fish, sediments and water column samples collected for various analyses, as well as various field measurements.

### **Field Reconnaissance and Biological Sampling for Wadeable Streams**

We continue our efforts to sample the 303(d) listed waters of the state, those waters requiring WLA studies, and those wadeable streams where potential water quality problems are suspected. The 2003-04 sampling effort consisted of approximately 90 sites (including replicated and duplicated sites). During the latter part of this year, staff biologists will begin the reconnaissance of sites for the next portion of the study. Similar to the previous collection efforts, these sites were situated statewide with the exception of the Mississippi Alluvial Plain which is the focus of a separate monitoring effort (see below). As mentioned above, all of the material has been sorted and sub-sampled, with taxonomy well underway.

## **Nutrient Criteria Development Projects**

We have been heavily involved in data collection from lakes and reservoirs, and estuaries with the intent of using these data to develop nutrient criteria for our state's water quality standards. In 2005, an effort will begin to address nutrients in Wadeable streams.

### **Lakes and Reservoirs Nutrient Criteria Development Study**

This study began in November of 2002 and will conclude in November of this year. The 50 largest lakes or reservoirs were chosen for sampling. A total of 98 sampling locations were situated on these lentic systems. Sample collection for nutrients, chlorophyll, dissolved oxygen, pH, specific conductance, transparency, and profiling are conducted during mid-March through mid-April, then again during June-September. This spring, we sampled the tributaries emptying into a few selected lakes and reservoirs, and the outflows. Data will be reviewed and additional work is likely to fill in some gaps.

Beginning in November, another set of lakes of smaller surface acreage will be sampled for a two-year period according to a scheme similar to that outlined above.

### **Wadeable Streams Nutrient Criteria Development Study**

In March 2005 we began to collect data to ultimately use for the development of nutrient criteria for Wadeable streams. Sample size for this study was 102 sites, most of which had been previously bioassessed. Two samplings were conducted in the spring (March and April) and another two are scheduled for the late summer (September and October). Water samples will be collected for chlorophyll, nutrient analysis, and in-situ parameters will be measured, and at a subset of the sites a periphyton survey will be conducted this year. The study is expected to be of two years duration.

## **Natural Resource Damage Assessments**

Staff Biologists continue to be involved in several projects of this nature:

### **Leaf River Oil Spill near Collins.**

We have now completed the Assessment Phase of this NRDA and will soon move into the restoration phase. The Final Restoration Plan was submitted to the court, and a consent decree entered. Restoration activities include:

a Rosgen-type stream restoration on the unnamed tributary into which the bulk of the spilled crude flowed;

construction, placement, and monitoring of wood duck boxes to replace the losses and lost services resulting from the wood duck mortality associated with the spill;

enhancement of wetland acreage and restoration of stream riparian zones at a nearby Nature Conservancy Preserve; and

continued monitoring and potential remediation of the groundwater resources that were contaminated.

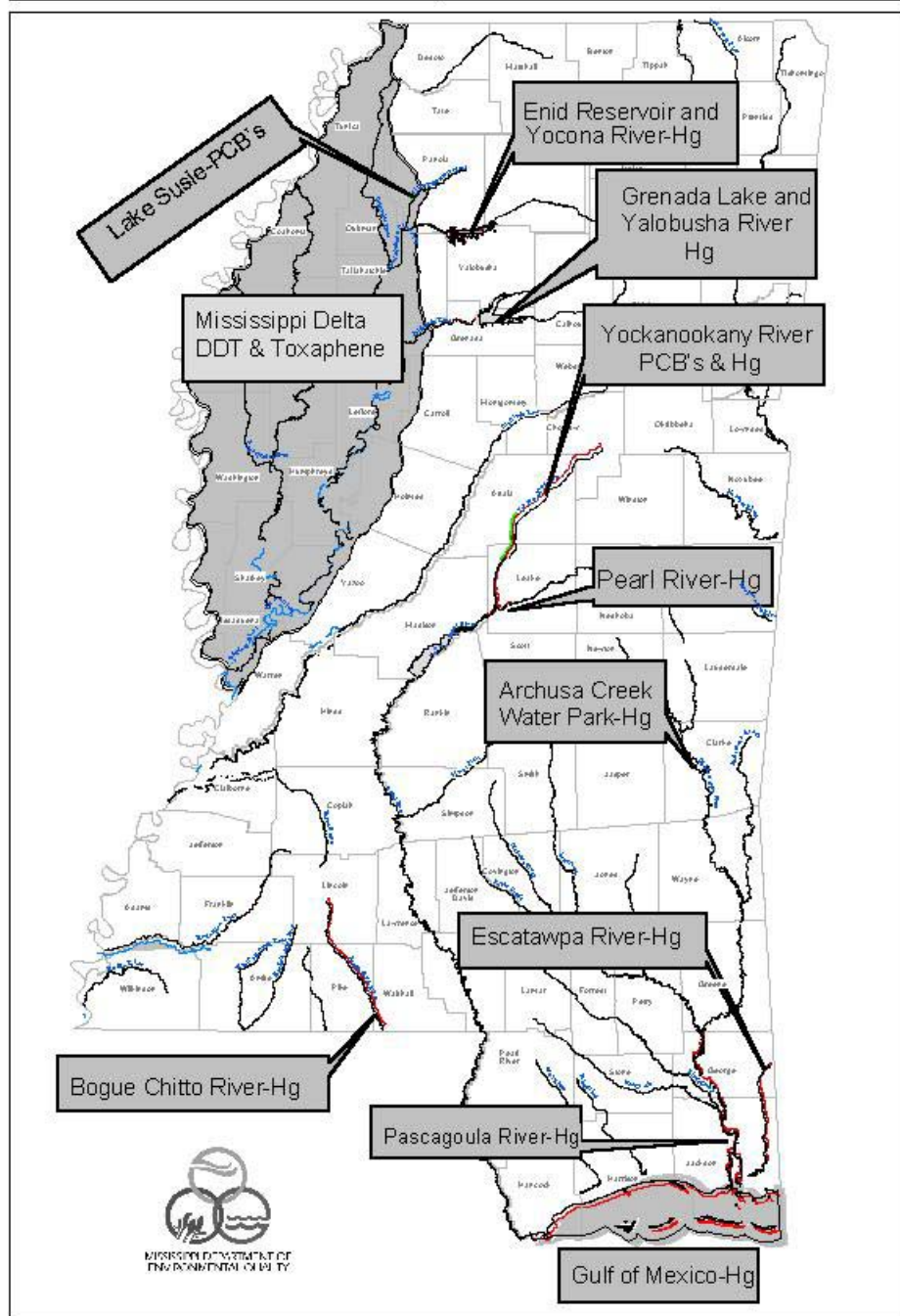
## **Fish Tissue Monitoring Program**

A figure illustrating all advisories currently in effect in Mississippi waters is given below:



# Mississippi Fish Advisories

July 2001



# **NORTH CAROLINA**

## **Organizational Changes**

As of July 1, 2004 the NC Division of Water Quality reorganized the Water Quality Section and the Groundwater Section into 5 new sections. What was the Environmental Sciences Branch of the Water Quality Section is now the Environmental Sciences Section. What we do has not changed, though.

## **BIOLOGICAL ASSESSMENT UNIT**

### **Staff Changes**

Since the last newsletter, Tracy Morman and Kathy Herring have left the benthos group. Tracy moved back home to Ohio to work with the Midwest Biodiversity Institute, and Kathy took a position with NC DOT in their Environmental Resources group. Dee Dee Black, who has worked with USGS in Atlanta for the past several years, will join the benthos group in August.

### **Basinwide Monitoring**

Basinwide sampling for fish and benthos is underway in the Savannah, Hiwassee, Little Tennessee, Watauga, Roanoke and White Oak River basins. IBI work is completed (70 sites) and benthos sampling is proceeding well.

### **Benthic Macroinvertebrate Special Studies**

The emphasis continues on TMDL stressor studies and watershed characterization for our Wetlands Restoration Program. Eleven watersheds were sampled in early spring and summer.

Impacts from a development with no erosion control in place was verified by a special benthos study.

### **Fish Community Special Studies**

In addition to basinwide IBI sampling, the fish crew were able to get a summer intern from NCSU, which allowed them to help with a grant funded project during June and July. The project will look at comparisons of benthos and fish data collected at the same site, to look for changes related to increasing urbanization, and whether benthos and fish communities show similar impacts. This project involved collecting IBI samples at over 70 sites.

### **Fish Contaminant Program**

Mark Hale has been working with USFWS this summer to collect fish within National Wildlife Refuges to gather background data on contaminant levels.

### **EPA WSA Study**

Eric Fleek is heading up this project, and what started as a projected 10 sites has morphed into a nightmarish 20+ sites, with no end in sight as Melgaard keeps sending emails adding to the list.

For further information on the Biological Assessment Unit, go to the Unit's web site -- <http://www.esb.enr.state.nc.us/BAU.html>; for further information on the fish community studies, contact Bryn Tracy ([bryn.tracy@ncmail.net](mailto:bryn.tracy@ncmail.net)); and for further information on the fish contaminant and fish kill program, contact Mark Hale ([mark.hale@ncmail.net](mailto:mark.hale@ncmail.net)).

### **Program Development Unit**

The NC DWQ has undergone a reorganization, and while the lab suffered minimal impacts, the Wetlands/401 Unit was broken up into four groups. The most interesting group, because it includes all of us biologists, is the Program Development Unit. Almost everyone in this group lives on grant funding from the EPA to look at aspects of our program and how we can use science to develop, enhance or focus DWQ's programs. Very heady stuff to be on the cutting edge of gathering science to create policy.

Getting more grants is how we keep our jobs around here, so in a supplemental EPA grant cycle, we were pleased to have funded a project entitled "Field Verification of Wetland Functional Assessment Methods within Local Watershed Planning Areas". Rick Savage is very happy that he will have a job for another couple of years.

We have had some personnel changes around here as well. After 28 years with DWQ, Dave Penrose has accepted a position with North Carolina State University. Most of his time is spent monitoring stream restorations trying to find out just how long it takes one to recover. The rest of his time is spent giving lectures, going to meetings and watching coeds on campus. What a rough life. Good Luck Dave! In a related old-timer-makes-good story, Larry Eaton accepted Dave's position for his first promotion in 16 years.

We are also anxiously awaiting the arrival of Virginia Baker, who will be joining us from the great state of Florida to help Rick monitor headwater wetlands. We haven't actually seen her yet, but by the time you read this she should be a well adjusted, highly integrated, over worked, under paid cog in the North Carolina wheel of bureaucracy. Welcome aboard Virginia!

Rick Savage and Larry Eaton have just returned from the 25<sup>th</sup> anniversary meeting of the Society of Wetlands Scientists in Seattle. They gave invited talks about their work on headwater wetlands and streams, respectively, in an early morning special session. If you would like an update of what they are up to, email them at [rick.savage@ncmail.net](mailto:rick.savage@ncmail.net) and/or [larry.eaton@ncmail.net](mailto:larry.eaton@ncmail.net).

### **INTENSIVE SURVEY UNIT**

Hello to all from North Carolina's Intensive Survey Unit. Probably been a while since many of you heard of us. We've been staying busy with TMDL and lake work, but Jimmie wanted me to take a moment and let you all know what we are up to these days. The following is some of the more interesting work.

As I said we've been assisting with TMDL development and this has lead to some very interesting data collection activities. For instances, we are doing a bacterial source tracking

(BST) study that has my staff sampling a wide variety of skat – no, not from Skat's (the burger place) but from deer, bear, dogs, people, pigs, if it poops we've probably collected it. The goal is to build libraries of skat signatures that will allow determination of the source of the bacteria in streams listed for bacteria contamination under 303(d). We are in our second year of sampling and have had good success building skat collecting partnerships with our Cooperative Extension folks and others. Ed Williams is the lead on this study and would be happy to answer any questions (919.733.6510 or [ed.williams@ncmail.net](mailto:ed.williams@ncmail.net)).

We've also been doing some low-level mercury sampling in watersheds listed for fish tissue contamination by mercury. Not as repugnant as skat sampling but interesting. The guys have the clean hands/dirty hands routine down and have seen very good results from the sampling. Michelle Woolfolk (modeler extraordinaire) summarized last year's sampling and concluded the following (quoted directly from her draft):

- DWQ can expect the water quality standard for total mercury to be exceeded, regardless of the presence of wastewater or stormwater.
- Concentrations of mercury in the environment were consistent with levels observed nationwide and in the southeast. Methylmercury concentrations were consistent with levels observed in the southeast. Southeastern methylmercury concentrations are generally higher than in other parts of the country.
- Statistically significant difference occurred between winter and summer data, and potentially between physiographic regions. We are collecting more data to confirm.
- BAFs for trophic level 3 and 4 fish were similar to the national range provided by EPA in their 2001 methylmercury criterion document.
- Target ranges for total mercury necessary to minimize potential adverse health effects were from 1 to 24 ng/L. Thus, in some cases the water quality standard may not be protective of fish tissue concentrations. Current NC total mercury standard is 12 ng/L.

We are continuing sampling this year in a variety of locations to further tease out physiographic and seasonal differences, as well as to provide information for use in TMDL and standard development. For modeling info, Michelle Woolfolk can be contacted at 919.733.5083 ext. 505 ([michelle.woolfolk@ncmail.net](mailto:michelle.woolfolk@ncmail.net)). Harold Quidley is the field lead for this study – 919.733.6510 or [harold.quidley@ncmail.net](mailto:harold.quidley@ncmail.net).

As in previous years we continue our summer ambient lakes sampling. This year we are sampling lakes in the Little Tennessee, Hiwassee, Savannah, Roanoke and White Oak river basins (43 lakes). Data collection began in June and will continue through August. The results of this summer's monitoring efforts will be incorporated into river basinwide reports that provide data for the development of any management plans, which may be deemed necessary due to impaired water quality. Debra Owen is the contact for the ambient lakes program (919.733.6510 or [debra.owen@ncmail.net](mailto:debra.owen@ncmail.net)).

We have several other studies going but I'll save them for another issue.

Happy Sampling, Dianne Reid (919.733.6510 or [dianne.reid@ncmail.net](mailto:dianne.reid@ncmail.net))

## **AQUATIC TOXICOLOGY UNIT**

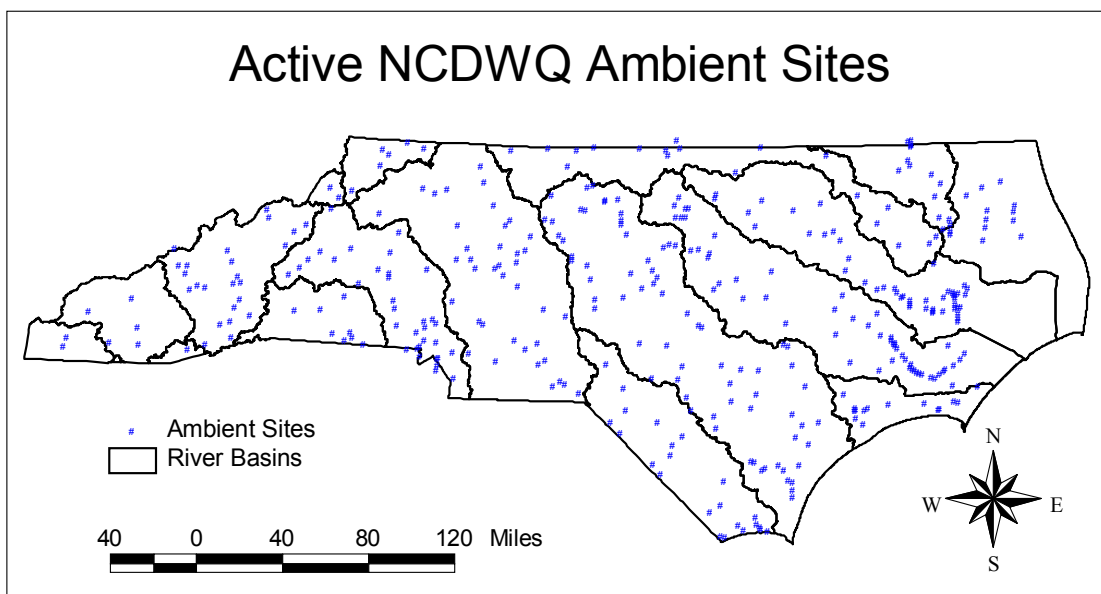
The Unit is currently involved in two special studies. The Unit is participating in an investigation of water treatment plants in conjunction with the US Fish and Wildlife Service. This study includes toxicity testing, chemical analyses, mock effluent testing, and aquatic population surveys. The purpose of the mock effluent tests is to determine the relative contribution of ions to toxicity. A known toxic effluent is analyzed for ions and the results are used to develop a “mock” effluent containing the same concentration of ions. A series of tests is conducted on solutions produced by mixing the original effluent with the mock effluent (for example, 0% mock:100% effluent, 25% mock:75% effluent, etc.). If the level of toxicity stays the same as the percent of mock effluent increases, the assumption is that the ions are causing the toxicity. If the level of toxicity decreases as the percent of mock effluent increases, there’s an indication that there is a toxicant present other than the measured ions that is being diluted as the percent mock effluent increases. Currently, Florida uses these tests in a formal fashion where ion toxicity may be a concern. Hopefully, the results of the study will significantly increase our knowledge of toxicants associated with water treatment plants.

A second special study is investigating the possible contribution of toxicants in sediment to observed biological impairment in the Neuse River basin. ATU’s contribution will be Microtox® testing of sediments.

The Unit has recently lost two biologists to re-location issues. Micah McMillan, formerly our primary testing analyst, now works for the Natural Resources Section of the General Accounting Office in Washington, DC. Micah is now lives in northern Virginia, close to his family. Todd Christenson, formerly our primary culture biologist, has relocated to the University of Maryland-Eastern Shore in association with his spouse’s post-doctoral appointment at UMES. To date, one position has been filled. Cheng Zhang is now our culture biologist and comes to us from NC State University where he was conducting research into the toxicity of carbamate fungicides to copepods and fish.

## ECOSYSTEMS UNIT

North Carolina Ambient Monitoring Program (AMS) data are now available through EPA's modernized STORET data warehouse at [www.epa.gov/storet](http://www.epa.gov/storet). There are over 4 million physical and chemical water quality results which are stored under two organizations based upon sampling dates as follows: 21NC01WQ- historic data through 1996 and 21NC02WQ- January 1, 1997 through December 31, 2003. There are currently 378 active AMS stations that produce approximately 90,000 results on a yearly basis.



## TENNESSEE

Greetings from Tennessee to all you SWPBA folks! I hope everyone is having an enjoyable and productive summer sampling season. As many of you know, Tennessee's Water Pollution Biologists are not centralized, but are a rather far-flung group, scattered across the state among various regional TDEC Field Offices and the Central Office in downtown Nashville. We also have a core group of very busy aquatic biologists within the Department of Health, who perform larger-scale special survey projects for TDEC, as well as toxicity testing. In addition, water quality work is performed by biologists within the Departments of Agriculture, Wildlife Resources, and Transportation. It is sometimes difficult to keep up with what everyone is doing ! But here are some dispatches from around the state on what some of our biologists have been up to recently :

### **TDEC Division of Water Pollution Control**

Nashville Field Office : We have wrapped up the fiscal 2003-2004 year, and have just completed planning and preparation for 2004-05. Last year we conducted over 100 benthic macroinvertebrate surveys, designed to determine stream use-support status in several target watersheds, including the Duck River, Buffalo River, and lower Tennessee River basins. Most of these surveys were "pollution screenings", utilizing the RBP I (Biorecon) type protocols. About 20 or so RBP3 benthic collections were also collected, primarily for Antidegradation Tier evaluations for point source receiving streams, and at our long-term Ecoregional reference stations. In addition to the biological surveys, we also conducted monthly chemical and bacteriological sampling at a network of around 55 stream locations within the same target watershed over the course of the year. For 2004-2005, we have planned out about the same number of chemical and biological stations within several of the watersheds we share with our great neighbor to the north, Kentucky, including most of the upper Cumberland River basin, and the Barren and Red River systems.

Knoxville Field Office : We will be monitoring in 5 watersheds this year: Big South Fork Cumberland, Clear Fork Cumberland, Upper Clinch, Powell, and Holston basins, around 57 benthic sites plus sites related to the Mining Section of Water Pollution Control. We have also been assisting TVA and the Park Service in a fish inventory of Big South Fork streams. Collecting, tagging and releasing of 8 different species of native fish to the Pigeon River continues, with the work done by TDEC, University of TN grads and volunteers. Attempts have begun to artificially propagate one fish, the Tangerine Darter, for re-introduction to the Pigeon, with much of this work being done by Conservation Fisheries here in Knoxville. We are working with a U.T. professor and grads on a project aimed at relating our benthic macroinvertebrate metric scores to sediment bedload and channel stability issues, which hopefully will help us with sediment TMDL development.

Columbia Field Office : In addition to the cyclic watershed assessment surveys, we have begun a special project centered around the effects of forestry activities. To this end

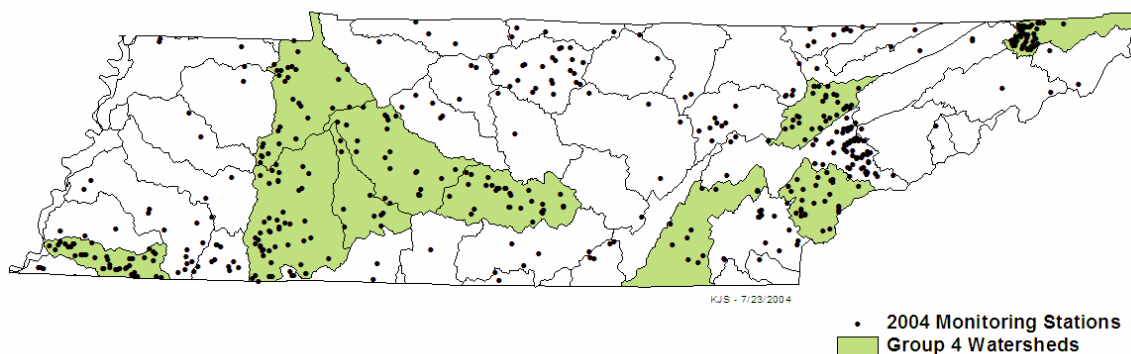
we established 6 stations for benthic macroinvertebrate monitoring using surber samplers. We anticipate 5 or so replicates at each station. The Control group will be prior to clearcut, treatment group will post-clearcut. The idea is to capture any biological changes due to clearcutting in a watershed. This came about because of the sudden sale of 175,000 acres of forest land formerly owned by the defunct timber company, Willamette; and the possibility that clearcutting may be accelerated as a result throughout Perry, Lewis, Wayne, Hickman, and Humphries Counties.

Jackson Field Office : We are busy performing bioecon assessments in the Hatchie River watershed, and have completed about 1/3 of the assessments that are on the list of approximately 120 to do. The goal is to have them completed by July 2005. We are also working with a consulting firm out of Atlanta, Tetra Tech, in their pursuit of the development of a sediment TMDL for West Tennessee. This involved 2 weeks of biological and habitat assessments in various watersheds in the 65E and 74B level IV ecoregions. The purpose is to compare and try to correlate our current habitat assessment scoring with a channel-stability ranking scheme that considers a much more detailed assessment of stream channel morphology and channel evolution. It may lead to a more quantitative or semi-quantitative evaluation of stream bed sediment particle size that is quick and doable in the field with very little additional manpower required.

Memphis Field Office : We are currently sampling in the Hatchie River watershed, and have several additional benthic sampling sites scheduled for later in the year. We also recently did a Stream Tier evaluation on the Wolf River, precipitated by the proposed expansion of the Moscow sewage treatment plant.

Central Office Summary :  
**Watershed Monitoring**

Tennessee has 54 watersheds that have been divided into 5 monitoring and assessments groups. The watershed approach was adopted in 1996. One group is monitored every year and all the watersheds are monitored every 5 years. This is second rotation of Tennessee's watershed cycle. Monitoring has been completed on group 3 watersheds. Some of Tennessee's regional offices completed monitoring of group 3 waterbodies and started working on group 4 waters. Over 600 waterbodies were monitored in fiscal year 2003/2004.



**Watershed Assessments**



Group 1 and 2 watershed assessments have been completed and incorporated in the Draft Version Year 2004 303(d) List. This list is available for public comment and can be viewed on our website at <http://www.state.tn.us/environment/wpc/publications/2004Draft303dlist.pdf>.

## **Data Management**

Tennessee has recently finished uploading all water quality chemical and bacteriological data to STORET. Regularly water quality data is uploaded STORET.

## **Special Projects**

### **Probabilistic Impounded Stream Project**

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The Division of Water Pollution Control receives many requests to impound streams through the Aquatic Resources Alteration Program (ARAP). Since the dams were built, the majority of these streams have not been monitored to determine if water quality criteria are being met. Currently, 10 streams are listed as impaired due to small impoundments upstream. The pollutants listed include flow alteration, iron, habitat, organic enrichment, low DO, and siltation. This study will address all these pollutants plus nutrients.

The 75 impounded stream sites in this study were randomly selected streams impounding reservoirs less than 250 acres in size. Samples were collected fall of 2003, winter, and spring 2004. The final samples were collected in July of 2004.

The purpose of this study is to determine the extent to which small impoundments affect a stream's ability to meet designated uses. Data will be used to help evaluate possible impacts of impoundments during the ARAP permit review process. Data will also be used to provide information for watershed assessments for the 2006 305(b) report and to aid in TMDLs on the 10 streams currently assessed as impaired by small impoundments.

### **Diurnal Dissolved Oxygen Project**

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This project is a continuation of the 2002, diurnal dissolved oxygen study (Arnwine and Denton, 2003). The 2002 DO study indicated that minimum reference DO levels were 6 mg/l or above in most of the state, while DO levels were often below 5 ppm in two regions. Results also suggested that the magnitude of the diurnal fluctuation was an important consideration even when minimum DO levels were met.

The results of this preliminary study have led Tennessee to realize that the current criterion may need to be further adjusted on a regional basis and needs to take into account diurnal patterns. However, the initial study was limited. Further data are needed before diurnal dissolved oxygen patterns can be determined with confidence.

The primary purpose of this study will be to take the findings from the 2002 DO project and expand them to include more ecoregions with streams monitored over a longer period. It will also include non-reference sites that support healthy macroinvertebrate populations, but whose daylight DO readings indicated night levels may fall below the minimum indicated for the region based on reference data alone. Although diurnal dissolved oxygen is the primary focus,

additional data will be generated during this study. Nutrient, habitat, and geomorphologic data will expand the existing ecoregion reference database and fill in current data gaps.

An additional focus of the study will be to characterize larger non-wadeable streams and rivers that cross multiple ecoregions in west Tennessee. The majority of streams and rivers in this region are channelized. This study will target reaches on larger streams and rivers that could be used to establish obtainable objectives for improvement of impaired reaches. Dissolved oxygen, nutrient, habitat, geomorphologic and macroinvertebrate data will be collected in reference and impaired waters.

The results of this study will be used for criteria development and to provide information for TMDLs in waterbodies listed for dissolved oxygen, nutrients, habitat, and siltation. The information will also be used for watershed assessments. Monitoring will take place from August through November.

## **National Demonstration of Randomized-design for Assessment of Wadeable River and Streams Project**

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TDEC is participating in a national study to generate statistically valid estimates of the biological health of wadeable rivers and streams at Level II ecoregions and aggregate estimates to the national scale. This project is a partnership between EPA and state organizations to monitor randomly selected streams and wadeable rivers according to Environmental Monitoring and Assessment Programs (EMAP) protocols.

The first phase of this study was the EMAP Western Study in 12 western states between 2000 and 2004. The second phase of the project is sampling of 500 randomly selected Level II ecoregion wadeable streams and rivers in 36 eastern states in summer and fall of 2004.

For Tennessee's participation in this project, TDEC will monitor the randomly selected sites located within the state. EPA selected about 20 wadeable test sites and 3 reference sites. These sites will be monitored according to EPA's EMAP protocols. Methods used will follow core indicators and standard protocols specified by EPA.

Biological samples collected according to TDEC *Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys* (TDEC, 2003) will be used for comparability analysis at each site as well as watershed assessments. This study will promote partnerships with EPA and other states and utilize additional expertise and resources.

## **TN Department of Health – Aquatic Biology Section**

The Aquatic Biology section is completing the last season of collections for the Impounded Streams Project this summer. This project involves chemical, flow, macroinvertebrate and algae surveys, which have been made for four seasons downstream of small dams across the state. This data should be helpful in future TDEC permit review of proposals to impound small to mid-sized streams, and in the design and operation of these small dams.

Aquatic Biology is also beginning an intensive four-month period of field collections for a Diurnal Dissolved Oxygen Project. This will involve the remote deployment of dissolved oxygen data loggers for two-week intervals, and the assessment of nutrient levels, instream habitat, stream geomorphology, and macroinvertebrates at 96 sites across the state. Most of these sites will be Ecoregional reference sites. The resulting data can hopefully be used in the development new oxygen use-support criteria for TN streams.

## **TN Department of Agriculture -- Water Resources Division**

The Tennessee Department of Agriculture's Water Resources Division participated in the 23<sup>rd</sup> Annual Milan No-Till Field Day. The event is the largest field day in the U.S devoted to no-tillage crop production techniques. It is always held in Milan, Tennessee at

the University of Tennessee Milan Experiment Station. Water Resources manned an Educational Display in the booth area of the Field Day. The booth featured photographs of BMPs (Best Management Practices) used to prevent water pollution on agricultural lands in the South Fork Obion and North Fork Forked Deer Watersheds in West Tennessee. The booth also featured a poster GIS map of the watersheds with BMPs that have already been established on streams. Publications on Conservation Practices for farms and forests were given out to the public.

This year there were over 100 commercial and educational exhibitors at the Milan Field Day. The last field day, in 2002, had over 4,200 people in attendance. The total count of this year's field day has not yet been determined.