

Newsletter
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SWPBA

Southeastern Water Pollution Biologists Association

LETTER FROM THE PRESIDENT

Greetings, fellow SWPB'ists! I hope everyone's spring sampling projects are going well. I know for many of us this has been one of the wettest early springs in years. We have had it all here in Tennessee : record floods, hailstorms, and a few tornadoes to boot. Our intrepid secretary, Amy Fritz, has put together this newsletter in the midst of the destruction of large sections of Jackson, TN, including the incapacitation of her office for several days.

But streams always recede again, and I know we will have many a beautiful day over the next few months to carry out our various missions in caring for the waters of our states. And it is also time to begin planning for a scenic fall trip to Tennessee!

I am pleased to announce that the 30th annual meeting of the Southeastern Water Pollution Biologist Association will be held October 21-23, 2003 in Nashville, TN. Our venue will be the Sheraton Hotel in the heart of historic downtown Nashville. The meeting facilities should be first-rate, and many attractions, restaurants, and of course live music are within walking distance as well. We will be sending out a local Guide with maps and highlights of the town in a future newsletter.

In addition to our usual excellent program of presentations by SWPBA members and invited speakers, the meeting will also feature a taxonomic workshop (specific taxa TBA), as well as field trip opportunities, including an interpretive night hike in Warner Parks and a canoe trip along the Narrows of the Harpeth. And of course, food and fun at the banquet and hospitality room.

So, make your plans now to come and confer, commune, and commiserate with your peers. In the coming days we will begin soliciting speakers for presentations, so please consider interesting topics you could share with us all.

Until then, here's to a productive summer ! - Jimmy

2002 SWPBA Business Meeting

The SWPBA Business Meeting was called to order at 10:20 a.m.

Old Business

- There was no old business to discuss.

New Business

- Dana Denson thanked all participants, moderators and officers for their efforts and asked if there were any items that needed to be discussed.
- Chip Cutcliff moved to open the floor for discussion of the new President and Secretary. Dave Melgaard seconded the motion. Chip Cutcliff nominated Jimmy Smith from Tennessee to be the 2003 SWPBA President. Dave Melgaard seconded to motion. Jimmy accepted the nomination. Chip Cutcliff nominated Amy Fritz from Tennessee to be the 2003 SWPBA Secretary. Dave Melgaard seconded the motion. Amy accepted the nomination. Nominations were closed and the votes were accepted with a unanimous aaye. Chip Cutcliff moved to close the nominations.
- Dana Denson passed the worm to Jimmy who then thanked Florida for hosting the 2002 meeting and expressed ideas for the 2003 meeting. A meeting date and location was not set but Jimmy mentioned two possibilities; one in a natural setting and one more centrally located. He then asked for anyone with ideas to please contact him to discuss them further.

Business meeting adjourned at 10:30 a.m.

Constitution and By-Laws of the Southeastern Water Pollution Biologists Association

Article 1. Name. This association shall be called the Southeastern Water Pollution Biologists Association (SWPBA).

Article 2. Purpose. The purpose of the Association shall be to promote further understanding of the aquatic biological communities and the impact of pollutants on the aquatic ecosystems and to provide a medium for exchange of appropriate information among the membership.

Article 3. Membership. General membership shall be restricted to State Regulatory and Tribal Water Pollution Biologists whose programs are funded through the Region IV Environmental Protection Agency and Environmental Protection Agency Region IV Water Pollution Biologists.

Article 4. Annual Meeting. An annual meeting of the membership shall be held in one of the eight states in Region IV of EPA. Attendance of the annual meeting is restricted to members, invited guests, and meeting sponsors. The executive committee will be responsible for final approval of the guest list. The manner of choosing the host state of the next years meeting will be to offer the meeting in the following order: Mississippi, Georgia, EPA-Athens, South Carolina, North Carolina, Kentucky, Florida, Tennessee and Alabama. A state will either offer to accept or refuse the meeting. Upon refusal, the next state in order will entertain the offer, until the host state is confirmed. The time of the meeting shall be at the discretion of the host state with the agreement of the members of the Executive Committee.

Article 5. Officers. The officers of the Association shall be a president and a secretary. At the annual meeting consenting nominees shall be voted on by the general membership in attendance with the majority vote recipient being declared winner. The officers shall hold office for a term of one year, and their terms of office shall not be coterminous. The terms of the officers shall begin at the close of the annual meeting at which they are elected.

Article 6. Activities. The Association shall be organized and operated exclusively for scientific and educational purposes, and shall not be organized or operated for profit. No substantial part of the activities of the association shall consist of carrying on propaganda, or otherwise attempting to influence legislation. The Association shall not participate in, or intervene in, any political campaign on behalf of any candidate for public office.

Article 7. Dissolution. The Association may be dissolved following a poll of the entire membership, conducted at the direction of the Executive Committee, in which two-thirds of the mail ballots received within 30 days of issuance support the dissolution.

Article 8. Ratification and Amendments. The constitution may be amended by a vote of the general membership in attendance at the annual meeting, providing a quorum of the two-thirds of the member agencies is present. Proposed amendments shall be submitted to the Executive Committee at least two (2) months before the annual meeting. The amendments shall become effective upon ratification by a two-thirds vote by the general membership in attendance at the annual meeting. In an emergency, amendments may be ratified by a two-thirds majority of the members responding to a mail ballot within 30 days of issuance.

BY-LAWS

Article 1. Annual Meeting. The annual meeting will normally be held in the fall of each year and will include a business meeting and the exchange of appropriate information. The presence of two-thirds of the member agencies shall constitute a quorum, and the business meeting will be held according to the Robert's Rules of Order.

Article 2. Election of Officers. The President and Secretary shall be elected by a majority of the general membership in attendance at the annual meeting. An unexpired term of President or Secretary shall be filled by majority vote of members responding within 30 days to a special mail ballot. In emergencies, interim appointments can be made by the Executive Committee.

Article 3. Office of President. The President shall be responsible for planning and organizing the annual meeting, and shall appoint a Local Arrangements Program Chairperson. The President shall appoint three (3) members to the Executive Committee, one of whom must be a member from the host state. The President shall make other appointments that he/she deems necessary and shall serve as Chairperson of the Executive Committee. The President shall preside as chair of the annual meeting.

Article 4. Office of Secretary. The Secretary shall be responsible for keeping the minutes of the annual meeting and the normal correspondence of the association. The Secretary shall disseminate the annual meeting agenda as appointed by the Executive Committee. In the first issue of the Newsletter after the annual meeting, the Secretary shall include the annual meeting minutes and a roster of attendance at the meeting. The Secretary shall also serve as a member of the Executive Committee. The Secretary shall furnish incoming officers with a copy of the Constitution and By-Laws.

Article 5. Executive Committee. The Executive Committee shall consist of the officers of the Association and three(3) committee members appointed by the President, one of whom must be from the host state. No member can be appointed to the Executive Committee more than three consecutive years. The President shall preside as Chairperson of the Executive Committee. The Committee shall meet prior to the annual business meeting and review all amendments to the Constitution or By-Laws and major motions to be presented at the annual meeting, if any. The Committee shall serve as a steering committee to decide the main points of discussion and presentation at the annual meeting. The Executive Committee shall decide the order and length of the papers to be given. It shall make recommendations concerning the policies of the Association. The Committee shall be responsible for notifying the members of the Association of the vacancies in elected offices and to solicit nomination for these offices. After reviewing the nominations, the Committee shall select a maximum of three (3) consenting nominees for each office and place their names on ballots to be distributed by the Secretary. The ballots received within 30 days will be opened and counted by the Secretary, and interim officers will be announced by mail.

Article 6. Program Chairperson. The President shall preside as program Chairperson and shall be responsible for preparing the call for papers, scheduling, appointing moderators for each session, and preparing the program for printing.

Article 7. Local Arrangement Chairperson. The Arrangements Chairperson shall normally be associated with the agency hosting the annual meeting. The Arrangements Chairperson shall be responsible for securing adequate facilities to properly host the annual meeting. Responsibilities will include reserving rooms for formal meetings, social gatherings, and the banquet; securing audiovisual equipment arranging the banquet, coffee breaks and luncheon facilities, providing registration receipts; advising members on lodging, arranging transportation and serve to make the planned activities run smoothly. The Arrangements Chairperson shall work closely with the President to achieve this goal.

Article 8. Ratification and Amendments. The By-Laws may be amended by a vote of the general membership in attendance at the annual meeting, providing a quorum of two-thirds of the member agencies is present. Proposed amendments shall be submitted to the Executive Committee at least two (2) months before the annual meeting. The amendments shall become effective upon ratification by a two-thirds vote by the general membership in attendance at the annual meeting. In an emergency, amendments may be ratified by a two-thirds majority of the members responding to a mail ballot within 30 days of issuance.

From the Secretary's Desk

It is a privilege to serve as your 2003 SWPBA secretary. Tennessee is excited and anxious about hosting this years meeting and Jimmy Smith and others are all working hard to try to make it a memorable occasion. Jimmy and others are coming up with some great ideas for workshops, field trips, speakers and of course, the banquet.

A few details are available on the cost of this years meeting:

- The room cost per night will be \$82.00 + tax.
- There is a \$14.00 parking fee for the use of the hotel's garage
- Registration fee including the banquet is \$45.00
- Registration fee not including the banquet is \$35.00
- Short sleeve t-shirts will be available for \$10.00; long sleeve t-shirts for \$15.00

Details about the speakers, workshops, field trips, after hours entertainment and t-shirt design will be forthcoming in the next newsletter planned to go out the first week of July 2003. A registration form for the 2003 SWPBA meeting will be included in that newsletter.

Kim Sparks, located in our Nashville Central Office, is hard at work coming up with this years SWPBA t-shirt design. She currently has about 30 designs in various stages of completion. We are all anxiously awaiting to see some of the final results. The t-shirt design will be available for viewing on the cover page of the July 2003 newsletter. In addition to many other talents, Kim is an excellent wildlife artist and all of us in Water Pollution Control are very lucky to have her as a part of our team.

I would also like to introduce a new member of SWPBA from the Mississippi Band of Choctaw Indians. Bernadette Hudnell, Ph.D. is the Director of this agency and recently joined SWPBA. Bernadette expresses a special interest in water quality standards and other interests in non-point source pollution and stream surveys. I'm sure we will all look forward to meeting Bernadette at this years meeting.

Please be thinking about the anticipated costs for this years meeting and discuss them with your supervisor. Also, please let me know if you need details about the 2003 SWPBA meeting earlier than the first week of July 2003 in order to secure approval for out-of-state travel.

Thank you,

Amy Fritz, 2003 SWPBA Secretary

SWPBA Database Record

Codes: _____, _____, _____, _____, _____ Contact: Yes / No Newsletter: Yes / No Member: Yes / No

Name: _____

Title: _____

Phone: (_____) - _____ Fax: (_____) - _____

Date Joined: _____ / _____ / _____ E-Mail: _____

Agency: _____

Division: _____

Section/
Group _____

Address: _____

City

State

Zip Code

Special Interests or Projects: _____

Interest Codes (Please Choose at least one or up to 5 Codes and enter at top of page.)

- | | | | |
|----|--------------------------------------------------|----|------------------------------------------|
| 1 | Macroinvertebrate Taxonomy / Rapid Bioassessment | 16 | Standards, Water Quality Criteria |
| 2 | Toxicity Testing | 17 | 305b |
| 3 | Laboratory Certification | 18 | Aquatic Macrophytes |
| 4 | Phytoplankton/Periphyton, Zooplankton | 19 | Ambient Trend Monitoring |
| 5 | Lakes/Reservoir Monitoring | 20 | Sediment Analysis/SOD |
| 6 | Estuarine Ecology | 21 | Culturing Organisms for Toxicity Testing |
| 7 | Marine Ecology | 22 | Computer Modeling/Applications |
| 8 | Wetlands | 23 | Coastal Program |
| 9 | 401 / 404 Certification | 24 | Microbiology |
| 10 | Ecoregion Definitions | 25 | Permit Compliance |
| 11 | Estuarine/Marine Macroinvertebrate Taxonomy | 26 | Program Manager |
| 12 | Stream Surveys | 27 | Groundwater |

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 and Mainstem Reservoir Water Quality Assessment of the Black Warrior 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 65 stations were monitored for these projects each month, April-October 2002, 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 *Tributary Embayment Water Quality Assessment of the Tennessee River Basin and Water Quality Assessment of Alabama Reservoirs for Nutrient Criteria and Total Maximum Daily Load Development*. Reconnaissance of sampling sites was initiated during March 2003 and will be completed in early April 2003. Monthly sampling, April-October, will be conducted at 28 Tennessee River reservoir embayment sites, with 38 sites sampled in other basins at the same frequency for nutrient criteria and/or TMDL development.

Protocol development and sample scheduling has been completed for compliance monitoring of Harris, Weiss, and Martin Reservoirs for established lake-specific nutrient criteria. Monthly sampling, April-October, will be conducted at 14 sites on these reservoirs. Additionally, the Sugar Creek embayment of Martin Reservoir will be monitored for TMDL determinations.

Protocol development and sample scheduling has been completed for the critical period (August) monitoring of Purdy, Gantt, Point A, Aliceville, Gainesville, Demopolis, Coffeeville, Inland, Jackson, West Point, Harding, Walter F. George and Big Creek reservoirs in accordance with the two-year monitoring rotation of all lakes in the state.

All RWQM data and long-term critical period graphs were copied to File-Server for Departmental use. Long-term mean growing season graphs are currently being developed and will be copied to File-Server upon completion.

Fish Tissue Monitoring Program

A total of 389 fish were collected from 41 locations in 33 waterbodies during the fall of 2002. Of the

389 fish, 353 were collected as part of ADEM's Fish Tissue Monitoring Program and 36 collected as part of ADEM's participation in the US EPA National Fish Tissue Study. All data entry was completed during the 2nd quarter, with data packets consisting of complete data spreadsheets, exceedance spreadsheets, quick reference spreadsheets (of FDA exceedance locations), and maps of sampling locations provided to program cooperators. A press release for the ADEM was written and provided to ADEM/Public Affairs for review and release.

Analytical data from fish collected from Opossum and Valley Creeks during the summer of 2002 was also compiled and presented to ADEM/Land. A meeting to discuss results was conducted with ADEM/Field Ops, ADEM/Land, ADEM/Water, and ADPH representatives in attendance.

Requests for FTMP data and information were processed for ADEM/Land Division (multiple requests), Auburn University Fisheries Dept., ADPH (multiple requests), ADCNR (multiple requests), Florida Fish/Game Dept., Florida DEP, TVA, USEPA, Olin Corporation (multiple requests), and private citizens (multiple requests). For more information on this project contact Chris Smith at ces@adem.state.al.us or 334-260-2700.

303(d) Water Quality Assessment Program

Reconnaissance and monthly sampling events for FY03 303(d) water quality assessments began in March. Personnel from the Montgomery, Birmingham, and Decatur field offices are combining efforts to sample 151 stations. The majority of these stations are located in ecoregions of the Tennessee and Coosa basins and will be sampled from March to October. Of these stations, 25 are part of the Ecoregional Reference Reach Program and will be assessed from March to November. Water quality parameters collected at these stations include organic enrichment, total and recoverable metals, and fecal coliform. Chlorophyll-a and Atrazine by Immunoassay samples will be collected at the Ecoref stations in addition to the other parameters. Intensive fecal studies will be conducted at 30 stations during the June to September time period. The Decatur Field Office has been tasked with the bulk of this study due to their close proximity to the stations and the short holding time of fecal coliform samples. For more information on this project contact Ransom Williams Jr. at rw@adem.state.al.us or 334-260-2715.

Ecoregional Reference Reach Program

During the past few years our Reference Reach assessments have been conducted in cooperation with our 303(d) water quality assessments. Monthly water quality sampling events and one time intensive aquatic

macroinvertebrate and fish community assessments have been conducted at sites that are located in ecoregions found within our targeted annual river basin-group (5 year rotating basin approach). During FY03 twenty-five Ecoref sites are being assessed monthly from March 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 will be conducted once during April/May and July August. For more information on this project contact Vickie Hulcher at vjh@adem.state.al.us or 334-260-2700.

Nonpoint Source Assessment Program

2003 Basin wide NPS Assessment: Preliminary evaluation of the available Tennessee basin data was initiated and potential NPS sites were selected for reconnaissance by FOD personnel. Reconnaissance was conducted on 128 stations in March and 73 NPS screening stations were selected in 30 sub-watersheds. Sampling, to include water quality samples, a macroinvertebrate assessment, and a fish community survey on selected stations, will begin in May 2003. For more information on this project contact Brien Diggs at lod@adem.state.al.us 334-260-2700.

In addition, two NPS intensive surveys will be conducted in the Tennessee basin this summer; the Sand Mountain area, and the Big Nance Creek sub-watershed. These are being conducted in an effort to demonstrate an improvement in water quality of streams that have had best management practices implemented in their sub-watersheds. Twenty-one stations in five sub-watersheds will be sampled during April, June, August and October 2003 and will include water quality samples, a macroinvertebrate assessment, and a fish community survey.

Bioassay Program

Our commitments for FY03 have been met so we are helping out in other programs until we get started on next year's commitment list in September of this year. For more information on this program contact Janet Branch at jlg@adem.state.al.us or 334-260-2700.

Fish Community IBI Assessments

Fish community Index of Biotic Integrity assessments were conducted at 60 stations as part of the FY '02 Black Warrior/Cahaba River Basin NPS Assessment and our Ecoregional Reference Reach Program. Identification of all fish from the 60 stations is complete and data entry and metric scoring are expected to be

complete by mid-April. This is the largest number of fish community assessments conducted by the Montgomery Branch in a single season. Fifteen new fish were added to the reference collection as a result of last year's sampling: *Lythrurus ardens*, *Percina maculata*, *P. shumardi*, *Etheostoma douglasi*, *E. bellator*, *E. rufilineatum*, *E. simoterum*, *E. caeruleum*, *E. histrio*, *E. douglasi*, *Amacrypta beani*, *Ameiurus melas*, *Pylodictis olivaris*, *Lepomis auritis*, and *L. marginatus*. Several of these fish are endemic to Alabama or the Mobile basin and have a very limited distribution. For more information on this project contact Lee Davis at mld@adem.state.al.us or 334-260-2700.

Ambient Monitoring Program

ALAMAP- Fifty-nine stations were randomly selected by EPA for monitoring for the FY '02 season. Monitoring is conducted in August. Approximately half of the stations were dry during the '02 season. EPA-Gulf Breeze completed a statistical review of '97-'01 data. Information obtained from the review will be used to evaluate and improve the program. For more information on this project contact Lee Davis at mld@adem.state.al.us or 334-260-2700.

Data Management/Storage

Development of the Department's Surface Water Quality Database (SWQD) is still underway. We have completed design of all data entry forms and most of the reports. User testing is underway to assure appropriate and accurate function. An initial test export from the Department's LIMS systems was successful, as was the test export to STORET. Additional LIMS and STORET exports must be accomplished to verify the accuracy and consistency of the populated STORET database. For more information on this project contact Vickie Hulcher at vjh@adem.state.al.us or 334-260-2700.

Just a Few Changes

We have had a few changes here in the Montgomery Branch of Field Operations since our last newsletter. Marion Bertolotti, long time chief of the Aquatic Toxicity Unit was promoted to Chief of the Environmental Indicators Section; Vickie Hulcher was promoted to take over as Chief of the Aquatic Toxicity Unit. We welcome five new staff, Gina LoGiudice and Michael Len, both Auburn University Graduates, joined the Aquatic Assessment Unit; Sandy Gibson, Grady Springer and Vanessa Pruitt, Auburn University at Montgomery Graduates, joined the Aquatic Toxicity Unit. Hopefully, resources allowing, we hope to be able to bring at least a couple of them to the SWPBA meeting this year!

**STATE OF FLORIDA
BUREAU OF LABORATORIES UPDATE**

Environmental Assessment Section News

Interactive Mock Audits and RCRA Audits Florida Department of Environmental Protection's Bureau of Laboratories has launched a new approach for training this year through Interactive Mock Audits. Throughout 2001-2002, FDEP focused on informing field organizations about the changes to the department's standard operating procedures and although this effort was a huge success, we could not accommodate every request. Organizations unable to participate in last year's training have the opportunity to receive training through a mock audit. These audits are organized from the perspective of how the Bureau performs actual audits, but instead provide participants with a critique of their sampling techniques without the formal audit report. The Bureau has also been conducting audits on private consulting firms to assess their ability to sample groundwater monitoring wells at RCRA sites. For more information: <http://www.floridadep.org/labs/training/index.htm>.

Quality of Science eNewsletter The Bureau of Laboratories has recently organized an informational bulletin in the form of a listserve e-mail that addresses various topics such as sampling training opportunities, QA Rule status, Department SOPs, NELAC Accreditation, field and lab auditing, phosphorus and mercury Round Robins, and many more. The eNewsletter is designed to keep the science community informed about technical advances and procedural changes affecting the quality of statewide data. For more information or to register: <http://www.floridadep.org/labs/training/listserve.htm>

State Parks Spring Sampling The Bureau of Laboratories has been conducting algal and invertebrate bioassessments of Florida's state park springs as part of the Springs Initiative biannual spring monitoring program. A new web site was created this past year for the Springs Initiative that contains information on various springs in the state of Florida (see www.floridasprings.org for details). For more information visit our web site: <http://www.dep.state.fl.us/labs/reports/springs.htm>

TMDL Studies The Bureau of Laboratories has recently conducted bioassessments primarily in the Tampa area to confirm the placement of impaired waterbodies on the TMDL (Total Maximum Daily Load) list. Preliminary results indicate a few of the systems have healthy macroinvertebrate communities and may be removed from the list. To access these reports, or for general information on the TMDL and Impaired Waters Rule, please visit our web site at: <http://www.dep.state.fl.us/labs/reports/basin/index.htm>

Environmental Education We continue to devote time and effort to routine educational opportunities including the Rainbow Springs State Park "Springs Day", the Ichetucknee Springs State Park field trip, the PJC Water Festival and the Front Porch Initiative at Maclay Gardens, among many other events.

Toxicology and Analytical Biology Subsection

- Biology and chemistry labs received a return NELAP QA audit. Both labs retained accreditation for all requested tests.
- Tox lab is performing an ongoing study of the effects of temperature on freshwater and saltwater algal species used for AGP tests.
- Analytical lab completed a study comparing the differences of filter pore size on the recovery of chlorophyll *a*. The study found that there was no significant difference on chlorophyll recovery between a 0.7 and a 1.2 micron pore size filter.
- Microbiology lab is studying the prevalence of enterococci bacteria in coastal recreational waters. The study is analyzing sediment and water column samples from areas that are considered to have minimal impact from anthropogenic sources. The purpose of the study is to determine ambient background populations around uninhabited coastal waters.
- Tox lab received a second Coulter Z2 cell counter. The second instrument will allow analysts to increase production in order to support extra AGP testing.
- Analytical lab received a new BOD autoanalyzer. The new instrument will replace an older autoanalyzer to maintain efficient output of BOD results.
- The Biology lab is in the process of transitioning from paper records to electronic records and using bar code scanners to track samples and chain-of-custody.

Invertebrate Zoology Subsection

- We're moving forward with NPDES evaluations in marine waters, using a gradient approach. We've completed one study on St. Augustine WWTP and will be conducting a second study in late April at Flagler Beach WWTP.
- Johnny Richardson has just completed The "Identification Manual for the Dragonfly Larvae (Anisoptera) of Florida and will be offering a workshop at the upcoming Florida Association of Benthologists Meeting in Gainesville, Florida May 8-10.
- We are currently involved with the development of a Lake Floristic Quality Index that involves doing plant identification training and method testing in a variety of lakes throughout the state.
- Working in conjunction with the Environmental Assessment Section, we have been evaluating and analyzing data for the recalibration of the Stream Condition Index. There's more work to be done but we've identified several new potential metrics that show promise identifying impairment along a human disturbance gradient.

Algal Biology Subsection

The Algal Biology Subsection continues to analyze phytoplankton samples from lakes all over the state that are collected by our Ambient program as a part of the Watershed Monitoring Status Network. These lakes were chosen because they were known or suspected to be impaired or there was no data from the water body within the last five years. The project is mainly targeting chemical data at this time, but phytoplankton is being collected while the collectors are at the site in case that information can be used in some way at a later date. Most of these are small lakes and ponds that are hard to access so the collectors figured they'd get everything they could while they were there. From the project's beginning in 2000 through the end of 2002, we have analyzed phytoplankton samples from 751 lakes. How many lakes are there in Florida you ask? Our web site says 7,800. That should keep us busy for a few years!!

We continue to do phytoplankton and periphyton identifications for many projects in Everglades Water Conservation Areas 1A, 2A, 3A, Rotenberger Wildlife Management Area, and the Everglades National Park. In addition to projects that the Water Management District conducts for their own information, FDEP wants to monitor recovery in these areas once the phosphorus criterion is put into place. We also continue to do periphyton identifications for periphyton collected in Florida springs as part of the State of Florida's Springs Initiative. Periphyton collections are also ramping up in water bodies being sampled as part of the TMDL (Total Maximum Daily Load) project. With all this increased workload, our backlog is soaring. We recently hired two new taxonomists to help with this astronomical workload. In addition to Dr. Maosen Hua and Meiqin Chen, we now have Michelle Dasher working on the soft algal identifications. We still have Tiffany Burns and Isaura Lorenzo-Perez on diatom identifications and have recently hired Ms. Ambika Tiwari to assist with those identifications. As all the taxonomists will tell you, we are bursting at the seams. Microscope space is becoming hard to find.

You may recall from past newsletter submissions and SWPBA poster presentations that we've been grappling with QC issues for our algal ID's for several years. Dr. Sally Levings has stepped up to the plate and used her statistical background to help us look at this problem with a better focus. With her help, we now have Standard Operating Procedures written for four different facets of algal identification quality control. The SOP's are still under review, but they should be put into place soon. In addition to our routine 5% re-identifications and our monthly "round robin" exercise where all the taxonomists sit down and look at specimens together and compare ID's, we are now proposing to add a quarterly assessment aimed at assessing analyst variability versus sample aliquot variability. This would involve each analyst analyzing the same aliquot of a sample twice and having the second and third analysts do the same on that aliquot. The goal is that inter-analyst variability (and intra-aliquot variability) be much smaller than inter-sample variability. If we can't tell our samples apart because of the noise, we might as well go home. We are also developing firmer guidelines for assessing the initial proficiency of newly hired and trained analysts and the on-going proficiency of all analysts. All of our QC procedures use Bray-Curtis similarity to determine if a QC passes or not. The statistical software we are using, PRIMER®, includes an analysis called SIMPER that pinpoints which taxa are driving differences between two or more analyses. This will help us to pinpoint where problems are, whether it's misidentifications, errors in counting techniques, or simply differences in level of identification. We are really excited about these new quality control assessment SOP's.

Kentucky News

The last few months have been rather interesting here at the Kentucky Division of Water. We underwent a major reorganization in January, and some items are still lingering. The reorganization included abolishment of one section, addition of another, and the establishment of a new branch. The Bioassay Section was abolished, but the original staff members were reassigned to different sections and are still performing their bioassay duties. The Water Quality Branch now has a new section, the TMDL section, and the Nonpoint Source Section was moved into a newly created branch, the Watershed Management Branch. See the write-ups below for more information, and the new membership database for Kentucky to see where staff have been moved to.

Water Quality Branch

Ecological Support Section

Staff in the Ecological Support Section weren't able to contribute to this issue of the newsletter. They'll have something in the next newsletter for sure.

Standards and Specifications Section

We are working hard to complete an electronic data submittal by April 1 per 305(b) reporting requirements for an off (non-report) year. This year's data will consist of the fourth watershed unit, the Green and Tradewater river basins. Fieldwork was completed for the fifth watershed unit (Big Sandy, Little Sandy, and Tygarts Creek river basins) and taxonomic and assessment work for that unit is underway.

The section has gained 3 persons: two biologists, Jessica Schuster and Danielle Rogers to help out in the TMDL program area, and Susan Cohn, formerly of the Bioassay Section. Jessica has been working with us as an interim, and Danielle comes from the Division of Air Quality. Their main duties will be rapid bioassessments in impaired watersheds to determine which sub watersheds are sources of impairment. Susan will help out in 305(b) assessments and reporting and GIS work.

We are also beginning the triennial review of water quality standards under EPA's disapproval and recent proposal in the federal register of a portion of our antidegradation implementation regulation. The issue is the Tier 2 or High Quality waters - how to identify and protect them. Because Kentucky regulations must pass through two legislative committees that are environmentally challenged, we will continue to have difficulty with progress in this area in a way that will meet with EPA approval.

TMDL Section

Under the recent reorganization of the Division of Water, the section was created and placed in the Water Quality Branch. Formerly, it was a program area in the permits

branch. Kevin Ruhl has headed up the 303(d)/TMDL program since his hire from USGS in 1999. Tom Van Arsdall now is Acting Supervisor until a supervisor is chosen, probably sometime in late May or June. The section has been snake-bitten since its creation. One prospective hire, a highly regarded hydrogeologist from the Kentucky Geological Survey, informed us the Friday before he was to start that his wife had just been offered a highly sought after position at a university in New Zealand. Then, two weeks later, Karen Schaffer, a recent hire who had been doing a great job in getting us underway with TMDL monitoring, gave us her resignation to start work with a consulting firm in the Louisville area. We wish both of them the best of luck (but gnash our teeth at the bad luck of losing two great people in an area that desperately needed them and which we had waited for years to be able to hire!). We were able to hire Eric Liebenauer away from a supervisor's position in Division of Waste Management, gain the knowledge and experience of Terry Anderson (the former Water Quality Branch Manager), and it looks like we soon will be able to re-fill the two positions from which there were resignations and the supervisor position.

Kentucky's 303(d) report was submitted to EPA in February and is expected to gain formal approval very soon. Impaired stream segment/pollutant combinations now number nearly a thousand after assessing three of the five watershed management units. This number will grow significantly as we assess the two most environmentally impacted areas of the state - the far eastern (coal mining) and western (agriculture and mining) areas of the state. We continue to contract out TMDL work, but with the recent creation of the section and new hires, we will be much more able to complete a significant number of TMDLs in-house.

Water Quality Certification Section

Staff in the Water Quality Certification Section weren't able to contribute to this issue of the newsletter. They'll have something in the next newsletter for sure.

Watershed Management Branch

The Watershed Management Branch was created under the recent reorganization of the Division of Water. The branch has three sections: Basin Team Coordination Section (this includes the Water Watch program), Nonpoint Source Section, and Water Quantity Management Section. The role of the Watershed Management Branch is to coordinate the implementation of the Watershed Management Framework and basin planning from both the quality and quantity perspectives. This includes identifying priorities by watershed, and for coordinating Division staff to focus efforts on those priorities in order to restore waters to their designated uses.

Nonpoint Source Section

The Nonpoint Source Section biologists have been busily working away. We completed our assessments for stream segments sampled in the Green River basin in 2001. We completed fieldwork in the Big Sandy and Little Sandy river basins, and have been working through our macroinvertebrate and fish samples. Our fieldwork this year has been focused on assisting the TMDL program (see previous section) with biological monitoring in several impaired watersheds in the Kentucky River basin. We've also started planning for our monitoring in the Salt and Licking River basins for next year. Information on some other activities we've had our hands in is:

There's More to Horse Muck than Manure

It's that time of year when the world turns to horse racing. With the first Saturday in May fast approaching you'll see images of rolling, lush, green fields, white fences and frolicking horses. Yes, that's Kentucky, thoroughbred horse capital of the world. Every day horse farms in only 5 of Kentucky's 120 counties dispose of nearly 1,000 tons of horse muck – So much for rolling in the grass. The 319(h) project Equine Waste BMP Demonstration Project – Demonstrating New Technologies for Composting Stable Muck Onsite and for Handling Stable Muck to Offsite Facilities promoted environmentally friendly disposal of muck as opposed to disposal in sinkholes, historically a favorite disposal method. Some muck was roll baled and sold for other uses such as growing mushrooms or for feed. The most successful part of the project, however, was the conversion of horse muck into compost. The process involves the use of windrowers, of an appropriate size and energy needed to accommodate the tractors generally used in the area, and using smaller manure spreaders. Kentuckians can utilize horse muck as a valuable soil amendment and help improve water quality. For more information see http://www.water.ky.gov/dow/pubs/TechBull_4.pdf.

We Can't Legislate, So We'll Educate

The Kentucky NPS Program has received what we believe to be the largest NPS education grant ever offered by EPA. The federal portion is almost \$800,000 and with match the grant will equal \$1.4 million. Primarily aimed at the adult population, the grant will include a virtual watershed tour provided by Kentucky Educational Television, professional teacher development, and a variety of slogans, TV spots and media blasting. The big challenge is the education of local elected officials. That is a moving target. This time around, the Kentucky Transportation Center will be helping by working with the guys with the dozers and shovels. The project involves over 20 partners with new ones wanting to sign on all the time. Stay tuned for more as it rolls out.

Rock Creek Recovering

From the Tennessee border to the confluence of White Oak Creek, Rock Creek is designated a Wild River and an Outstanding Resource Water. From White Oak Creek on to the confluence with the Big South Fork of the Cumberland River it is a different story. Impaired by more than 40 coal mine portals and eight coal refuse dumps, the Lower Rock Creek Watershed has been listed as non-support for aquatic life and swimming.

The Kentucky Division of Abandoned Mine Lands sought a 319 grant to install BMPs along Rock Creek which included removal of coal refuse from the banks of the creek, installation of open limestone channels, construction of modified vertical flow systems and the application of limestone sand. Dramatic improvements such as a reduction of acid loading from 110 metric tons monthly to near 0, removal of 25,000 yd³ of coal refuse from the banks and re-vegetation of banks have reduced sediment entering the stream by 500 tons annually.

Project funding in the amount of \$970,000 included \$200K from a 319(h) CWAP grant and additional funds from Appalachian Clean Streams Initiative, (\$280K), Personal Responsibility In a Desirable Environment (PRIDE) grant from NOAA, (\$250K), Kentucky Abandoned Mine Land grant (\$160K) and USGS Cost Share (\$80K).

The good news is that Rock Creek went from full non-support to partial support of WAH. Since the BMPs were installed we've seen improvements in fish populations. Diversity and numbers are also increasing. For more information, see: http://water.nr.state.ky.us/dow/pubs/Technical_Bulletin_Rock_Creek.pdf.

MISSISSIPPI HAPPENINGS

Field Activities

Since the last SWPBA Newsletter, MDEQ staff has been heavily involved in several large-scale projects:

National Coastal Assessment

The coastal contingent of the EMAP effort is continuing into its fourth year of individual states' administration. Thus far, 135 sites have been sampled for a full spectrum of physicochemical parameters, water, sediment, fish, and benthic organisms for a full range of analyses as well as community structure determinations. The current year's effort is scheduled to involve 50 sites. David Barnes and Barb Viskup are representing the Biological Services Section during this sampling effort

Biological Monitoring and Assessment of 303(d) Listed Wadeable Streams and Rivers of Mississippi Project

This project is a continuation of the 303d/IBI biological monitoring project mentioned in previous newsletters. This project involves the continued collection of macroinvertebrate samples from additional 303(d) listed wadeable streams. Samples collected in 2002 (Phase II) have been identified for some time now. Taxonomic verifications by a third party laboratory were within the DQO's established for this project. The 2002 data has been analyzed and EDAS is being populated with the data.

A total of 198 sites was selected for sampling during the 2003 winter index period (Phase III), however, heavy rains occurred several times during the course of the study and approximately 140 sites were actually sampled. Similar to other phases of this project, field teams measured dissolved oxygen, pH, specific conductance, temperature, conducted habitat assessments and pebble counts, and collected water samples for nutrient analysis in addition to conducting the biological survey. The chemical analysis of the water samples is now completed. The biological samples are currently being processed and taxonomy will begin as soon as samples are received from the contractor's lab. For more information, contact Mike Beiser, Project Mgr., at (601) 664 – 3959 or Mike_Beiser@deq.state.ms.us

Pfiesteria Project

Biologists have been working with personnel from the University of Southern Mississippi Institute of Marine Sciences Gulf Coast Research Laboratory in order to identify areas along the Mississippi Coast that could harbor *Pfiesteria* sp. or *Pfiesteria*-like organisms. Sediment samples will be collected from twenty sites that have been previously screened and noted to have conditions adequate for *Pfiesteria* sp. or *Pfiesteria*-like organisms. Sampled sediments will be sent to the University of North Carolina Greensboro, where a molecular probe will be used to distinguish *Pfiesteria* sp. from other species. Nutrients, metals, and chlorophyll samples will also be collected and analyzed. This project is scheduled to begin in mid-May.

Nutrient Criteria Development (Lakes)

The U. S. EPA has mandated that the states develop and implement nutrient criteria for surface waters. To assist with nutrient criteria development, the MDEQ has formed a multi-agency Nutrient Criteria Task Force (NCTF) to provide technical advice and guidance on the development and implementation of nutrient criteria for the waters of the state. The Lakes Subcommittee of the Nutrient Task Force has reviewed existing data to determine data gaps, and determined that data gaps did exist, particularly during the growing seasons. This additional data is needed in order for the agency to proceed with criteria development for nutrients. In October and November of 2002, Phase I of the Nutrient Lakes Pilot Study was initiated to begin providing data for this effort. A total of 90 sites, located on 40 of the states largest lakes and 10 managed (fertilized) lakes, were sampled statewide.

Data collected from Phase I have been compiled and is under review. Phase II of this study was conducted in April 2003 and consisted of repeating the sites/lakes sampled in Phase I. Data is presently being validated and entered into a database for statistical analysis.

An intensive summer/early fall Phase III study is scheduled for August – September 2003, in which all 90 previously sampled sites will be sampled on a monthly basis.

Nutrient Criteria Development (Streams/Rivers and Estuaries)

In addition to lakes (mentioned above), the MDEQ is also actively pursuing the development of nutrient criteria for Mississippi streams rivers, and coastal estuaries. Several interagency task force committees have been formed and are rapidly processing existing data and information and developing recommendations for future data collection needs. A major focus of nutrient criteria development is being placed on obtaining an understanding of the cause and effect relationship between nutrient and biological characteristics. For more information contact Leslie Barkley, WQ Standards Coordinator, at (601) 961- 5667or Leslie_Barkley@deq.state.ms.us.

Ecoregion Projects

Mississippi Level IV Ecoregion Project

We continue to make minor adjustments on the finalization of the poster illustrating the subcoregions of Mississippi. A draft version of the poster was displayed at the recent National Biological Assessment and Biocriteria Workshop, and received many positive comments. Hopefully the final poster will be printed and ready for distribution at this year's SWPBA Meeting.

Natural Resource Damage Assessments

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

Leaf River Oil Spill near Collins.

Work continues on this Natural Resource Damage Assessment and Restoration (NRDAR), with the development of the Final Damage and Restoration Plan (DARP) for this stream and associated wetland and tributaries that were impacted by the spill scheduled for completion in mid-June. The Trustees and Responsible Party have reached a conceptual agreement on appropriate restoration activities in several key areas: habitat enhancement for Wood Ducks; wetland restoration; and groundwater remediation. Consensus on restoration activities has recently been reached among the trustees and the Responsible Party for the tributary and riparian zone injuries that occurred.

Oil Spill in Boggy Hollow, near Purvis, Mississippi.

Having received the report of the results of the amphibian survey and the biological assessments conducted to quantify damage, the trustees have begun to consider restoration alternatives. This information will be used to finalize the Damage Assessment and Restoration Plan (DARP) for this incident.

Oil Spill into an unnamed tributary to Perry Creek, near Tinsley, Mississippi.

On or about May 2, 2003 a ruptured pipeline caused 22 barrels of crude oil to enter an unnamed tributary to Perry Creek. Biological Services Section staff visited this site soon after the spill occurred to conduct field measurements and collect samples for analysis to determine environmental damages attributable to this spill incident. We are awaiting results of the sample analysis and anticipate formulation of an assessment and restoration plan in the near future.

Fish Tissue Monitoring Program

Ambient Fish Tissue Monitoring

Our ambient fish tissue monitoring program anticipates collecting fish from 25 sites during the summer.

Special Studies

Fish Kill Investigations

Twelve fish kills were investigated by the MDEQ between July 2002 and present. Over 65% of the kills were associated with low dissolved oxygen levels. One kill was linked to a raw sewage discharge with the remaining kills being of unknown origin. Eight of the twelve kills occurred in the northern portion of the state and the remaining kills located in the central portion of the state. No kills were reported from our South Regional Office.

News from North Carolina

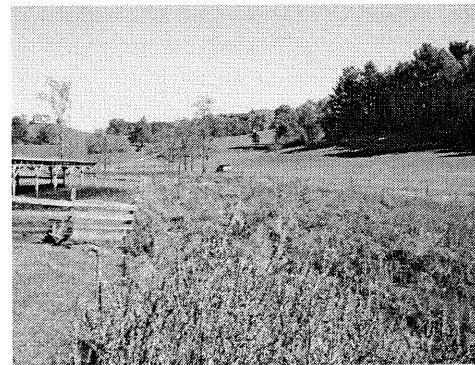
NC Division of Water Quality; Wetlands/401 Certification Unit

Four monitoring projects, which are funding by EPA grants, are being conducted within this unit. A short summary for each of these projects is included here with a contact person if more information is needed. It is anticipated that these monitoring projects will be part of an applied research unit once the Divisions reorganization is complete.

Ecological Functions of Restored Streams

Stream management and restoration require knowledge of the complex interactions between the catchment and stream processes. Stream systems are dynamic environments where channel stability location and habitat characteristics frequently change in response to erosion, deposition or sediment processing efficiency. Stream restoration projects attempt to stabilize channels in such a way that physical long-term equilibrium is ensured. Stream restoration projects summarized in this document are projects in which the pattern, dimension and profile of altered stream systems are modified to mimic reference conditions. Biological communities in streams must adapt to these changing environments. However, very little is known about the response of ecosystem structure and function to stream restoration. It is generally assumed that as habitat heterogeneity following restoration increases, that diversity and taxa richness of keystone species will increase as well (MacArthur, 1965). But this hypothesis has not been tested and the success or failure of stream restoration projects based on these data is poorly understood. The restoration of degraded streams has become a major initiative nationally (Charbonneau and Resh 1992, Roni et al. 2002). However, the restoration of stream channels, including the construction of instream habitats, and associated responses within aquatic insect populations is a relatively new area of interest.

This report summarizes benthic macroinvertebrate information from fifty (50) stream restoration projects in North Carolina. However, to date only 14 of the 50 projects summarized in this report have post-construction information and only 7 of these projects have more than one year of post-construction data. Many of these projects were constructed as compensatory mitigation and did not fully comply with the protocols outlined in this report. As a result of the work done by the grant protocols have been established for the collection and analyses of these data. These protocols suggest that pre-construction data should be collected, then allow stream conditions approximately one year to equilibrate followed by three annual and consecutive surveys (a total of 5 year monitoring period). All surveys should limit the effects of seasonal



variability and use collection protocols established by the NC Division of Water Quality. The protocols also

recommend that a minimum of two stations per project be established: an upstream monitoring location above the restoration reach and one site within the section of stream receiving restoration. Other stations such as an ecoregional reference location, or recovery location below the restoration reach are optional. Very low flow, drought conditions have been recorded from streams in North Carolina. These unusual, low flow conditions may have affected the results of many of these investigations. However, in most instances, biological data will continue to be collected during normal flow regimes.

Preliminary results and observations of these data suggest that some limited reestablishment of ecological stream functions occur relatively soon after restoration. In most instances, these results have been noted from rural catchments that have stable reference reaches connected to the restored stream reach. However these data also indicate that there are suites of benthic insect taxa that are habitat-specific and movement of these taxa into restored stream reaches will take much longer due to habitat requirements. These specific microhabitats include macrophytes such as Podostemum, fine rootlets in the current along the stream banks, large woody materials and logs. Also, in many instances, stream restoration projects in small, rural catchments are attempting to replant riparian vegetation. Successful reestablishment of reference, wooded conditions would therefore shift feeding types of benthic macroinvertebrate communities from those dominated by grazers (lack of wooded buffers) to shredders (wooded buffers).

Preliminary data from many of the restoration projects that are within urban catchments indicate that stormwater or urban nonpoint runoff has an overriding impact on the biological integrity of restored reaches. These data suggest that stream restoration in urban streams should include active stormwater management if successful reestablishment of ecological functions are expected. Many of the more recent urban stream restoration projects do have stormwater management plans and part of future analyses of these data will examine whether stormwater management of restored urban streams is beneficial to the biology of these systems. These data also indicate the importance of having stable, upstream reference reaches for comparison to restored reaches.

Based on preliminary data and observations, draft biological success criteria have been established. These criteria are based on the selection and use of appropriate reference data. These draft success criteria will be examined and refined based on further collection and analyses of additional benthic macroinvertebrate data over the next few years. These criteria will be further tested and improved as data storage and manipulation capabilities are refined within the Unit.

For more information about this EPA grant please contact Dave Penrose (dave.penrose@ncmail.net or 919/733-9502).

MacArthur, R.H. 1965. Patterns of species diversity. *Biological Review*. 40:510-533.

Charbonneau, R. and V. H. Resh. 1992. Strawberry Creek on the University of California, Berkeley Campus: a case history of urban stream restoration. *Aquatic conservation: marine and freshwater ecosystems* 2:293-307.

Roni, P., T. J. Beechie, R. E. Bilby, F. E. Leonetti, M. M. Pollock, and G. R. Press. 2002. A review of stream restoration techniques and a hierarchical strategy for prioritizing restoration in the Pacific Northwest watersheds. *North American Journal of Fisheries Management*. 22:1-20.

Functions of Intermittent Streams

Winter intermittent stream samples have been collected and about half of them have been analyzed. The preliminary data seem to show that when these intermittent stream segments are wet, they look similar, but not identical to, perennial sections further downstream. This includes the presence of taxa we have

previously thought to be good indicators of perennial flow: mayflies, stoneflies, caddisflies and crayfish. This is very different from summer when they looked more like the dry ephemeral segments we don't protect. Obviously the story in these little streams is more complex than we originally thought.

In May, Dave and Larry spent some time looking for intermittent streams in the mountains to compare the way they function with the piedmont streams we currently have going. Much to our surprise, it was nearly impossible to find an unimpacted stream with an intermittent segment. Streams in most forested watersheds began at springs and streams with intermittent segments nearly always had had the hydrology altered in some way (roads, development, etc).

Dave Penrose presented this data at a conference at the Water Resources Research Institute in early April. Despite projector problems, Dave and the message were so compelling that a lawyer from the Southern Environmental Law Center called to request a copy of the talk. We will see how they use this information.

For more information about this grant contact Larry Eaton (Larry.Eaton@ncmail.net or 919/733-

Effects of Storm Water Discharge to Wetlands

The impact of stormwater has become an increasing concern to biologists in recent years, particularly in rapidly urbanizing watersheds. Much attention has been focused on techniques to address these impacts, such as wet and dry detention basins, level spreaders, rain gardens, etc. A much more low-tech method of managing stormwater involves the use of naturally occurring wetlands as treatment sites. This often occurs unintentionally as wetlands in urban areas inevitably receive run-off from surrounding developed areas. In some cases, discharge of stormwater into natural wetlands is an intentional design feature, aimed at using the natural filtration and sedimentation functions of wetlands to treat non-point run-off.

However, little work has been directed towards understanding the full impact of storm water on wetland ecosystems and virtually no studies explore the circumstances under which wetlands can effectively be used to treat this run-off. Under an EPA grant, the Wetlands Unit of the NC Division of Water Quality is monitoring several wetland sites in order to assess the impacts of storm water on natural wetlands. Additionally the monitoring is aimed at evaluating the effectiveness of different wetland types and delivery devices in treating storm water.

Several sites have been established for monitoring in the Piedmont and Coastal Plain of North Carolina. Sites include riparian headwater wetlands and isolated emergent and forested wetlands that receive storm water from residential and commercial development. In some cases, pre and post construction data will be collected and, in the case of already constructed sites, non-impacted reference sites have been established for comparison.

Biotic and abiotic parameters being monitored include vegetation structure and composition, presence/absence of amphibian species, tree mortality, sedimentation rates, sediment particle size, hydroperiod, and water chemistry during periods of inundation. Research is currently ongoing, however we hope to present initial results for 2003 in December. Eventually this research will aid in the development of state policy guidelines for the discharge of stormwater into natural wetlands.

For more info, contact Ed Schwartzman (edward.schwartzman@ncmail.net or 919-733-1787).

North Carolina Wetlands Monitoring Program

The Wetlands/401 Unit of the North Carolina Department of Water Quality is beginning a three-year wetlands monitoring program utilizing GIS and field research. Monitoring will be limited to two types of freshwater wetlands. Adjacent land use, watershed land use, and ecoregion location will affect site determination. The program will obtain hydrology, water chemistry, soil and sedimentation data, and assess the vegetation, macroinvertebrate, and amphibian communities along a human disturbance gradient. Human disturbances of interest include hydrologic change, sedimentation, and nutrient loading. The gradient of disturbances on the sites will range from minimally impacted to degraded. An index of integrity will be established to look at the response of the biotic communities along the disturbance gradient.

For more information, contact Amanda Mueller (amanda.mueller@ncmail.net)

NORTH CAROLINA BIOLOGICAL ASSESSMENT UNIT

Fisheries Activities: Basin-wide Monitoring

Eighty-five streams were sampled in 2002 for the fish community assessment program. Basinwide monitoring activities in spring and early summer 2002 focused on wadeable streams in the Tar, Catawba, and French Broad River basins. The basins were previously monitored in 1997. Special studies conducted during 2002 included a Wetlands Restoration Project in the middle Cape Fear River basin, a follow-up sample below a metals plating facility in the upper Catawba River basin, two follow-up samples of 303(d) streams in the Yadkin River basin, and a sample as part of DWQ's Collaborative Assessment of Watersheds and Streams program on Corpening Creek in the upper Catawba River basin. Data from all of DWQ's fish community monitoring efforts can be found at: <http://www.esb.enr.state.nc.us/NCIBI.htm>.

Presentations

During 2002 and early 2003 presentations about DWQ's fish community assessment program were given to:

- Yadkin-Pee Dee River Basin Association
- NCSU's Student Chapter of the North Carolina Chapter of the American Fisheries Society
- NCSU's Watershed and Wetlands Hydrology Course
- American Fisheries Society's 2003 Southern Division Meeting

Monitoring for Mercury in Fish Tissue

DWQ continues to monitor mercury in fish across the state. Fish surveys near Riegelwood began in 2001 and will continue as resources allow to monitor mercury in fish tissue after the removal of a known atmospheric source of mercury. The survey will monitor six stations around a dismantled chlor-alkali plant.

Another survey scheduled for Spring 2003 will monitor 13 sites on the coastal plain for low-level ambient mercury levels. Staff will sample fish, sediment, water, and effluents to determine ambient levels of mercury in surface water and to develop site-specific bioaccumulation factors for fish.

DWQ continues to monitor mercury levels in commercial and recreational caught marine fish species through a joint effort with other state agencies. Spot, croaker, speckled trout, and bluefish were sampled during the winter of 2002. More species will be assessed during the spring of 2003.

Benthos Activities in 2002

The benthos group finally was able to get one of our vacant positions unfrozen. In February, 2003, Bill Crouch started work with the Unit. He comes to us from the Stroud Water Research Institute in Pennsylvania and will be a valuable addition to the staff-especially since he likes midges!

Basin Assessment

Basinwide studies continue on a normal five-year rotation. We are writing up reports for the Tar, Catawba and French Broad basins and planning sampling for the New and Cape Fear basins. Winter sampling has commenced for streams that might be expected to go dry during a normal summer, especially swamp streams, Slate Belt streams and Triassic streams. Recent drought conditions have drastically reduced the diversity of macroinvertebrates in the Slate Belt/Triassic streams, and may preclude any evaluations of water quality.

Special Studies

WRP/TMDL Studies: Our workload has greatly increased through the addition of many special projects related to TMDL or Wetlands Restoration Program projects. Where prior data has indicated problems at a single site, we plan and implement a biological evaluation of the entire catchment. This often requires us to work outside of the normal summer index period (summer schedules are already full!) or to work in smaller (nonrateable) streams. In many cases we must supplement the normal data summaries (EPT taxa richness, Biotic Index) with other methods of analysis, including presence of long-lived stoneflies, abundance of philopotamids, number of unusual species, etc.

Drought Study: Kathy Herring has been coordinating a study of drought effects on the most susceptible streams. We have documented very severe effects in many streams and rivers, and are monitoring selected sites for recovery.

Swamp streams: The swamp stream rating has undergone yet another revision, and passed review by a panel of university researchers. We will be assigning ratings to swamp streams, starting with the Tar basin report that is currently under review.

303d streams: Streams that receive a Fair rating for the first time (often during basin-wide studies) must be resampled in the following year to confirm any water quality problems. This project now constitutes a significant part of each year's schedule.

Taxonomy Unit

We have been working with the Purdue University mayfly group (especially Bill McCafferty) to update mayfly records for North Carolina. We have mailed them both mayfly records from our data base and mayfly specimens for confirmation of our identifications. This project should produce information on all rare mayflies in the state, with an evaluation of their "conservation" status. We also have discovered two new mayfly

species: a *Paracloeodes* from the inner piedmont (Cape Fear and Yadkin basins) and a *Stenonema* from two locations in the foothills region, and the paper finally came out that named the mayfly after Trish: *Baetopus trishae*.

We are still working with Kurt Schmude (Indiana) on identification of adult *Stenelmis*. We obtained his thesis on interlibrary loan, and worked up a shortened version of his United States keys (for just North Carolina species). Eric Fleek has been taking digital pictures of specimens confirmed by Kurt. Taking *Stenelmis* to

species can improve water quality assessments, as one species (*S. crenata*) is very tolerant while many other species are both rare and highly intolerant. As an outgrowth of the many specimens being sent to Kurt, another new *Stenelmis* species was discovered from the southern coastal plain, esp. the Sandhills. Kurt Schmude now has at least three new species from the southeast that need formal descriptions.

There are several *Isoperla* species in the coastal plain that are either undescribed or unassociated. Boris Kondratieff will be visiting in late April to help us rear nymphs or collect adult stoneflies. Several of the new *Perlesta* recently described by Boris from Virginia are also expected to occur in North Carolina.

INTENSIVE SURVEY UNIT

Current projects include managing and preparing reports on lakes throughout the state where water quality sampling was performed in the summer of 2002. Water quality sampling is performed on all of the significant lakes in the state on a rotating basis by river basin every 5 years. Other current projects include working on a reclassification study of some areas in the New River. Requests for reclassification suitable for commercial shellfishing have been made of these coastal waters by the Division of Shellfish Sanitation due to the removal of some dischargers and correspondingly lower fecal coliform bacteria levels.

The Intensive Survey Unit is preparing for this summer's ambient lakes sampling efforts. A total of 34 lakes in the Cape Fear and New River Basins will be monitored once per month in June, July and August. Thirteen of these lakes will be sampled by volunteers from our Winston-Salem Regional Office. A total of 83 sites will be sampled each month for physical and chemical parameters. Biological sampling will consist of analysis of phytoplankton samples collected from within the lake photic zones. Managers and owners of the lakes to be sampled have been contacted and coordination for access to the lakes has been obtained.

ISU staff is sampling for Fecal coliform, *Escherichia coli* and enterococci bacteria in selected streams that have been placed on the North Carolina Division of Water Quality's 303(d) list of impaired streams. The purpose of this sampling is to define the level of stream impairment for bacteria according to North Carolina water quality standards and EPA water quality criteria for fecal coliform, *Escherichia coli* and enterococci and to allow comparison of methodologies for *E. coli* and enterococci analyses. With this level of intensive sampling, approximately 6 different geometric means will be available for each stream segment assessed. The project will benefit the State of North Carolina by providing a scientifically accurate assessment of bacterial contamination of selected 303(d) listed stream segments and will assist in development of an updated bacteria standard.

ISU staff will be conducting a Bacterial Source Tracking (BST) project on selected stream basins in North Carolina that have been placed on the North Carolina Division of Water Quality's 303(d) list of impaired streams. The purpose of this study is to identify known sources of bacteria contamination to streams. Using a

variety of methods available, which include antibiotic resistance analysis and RNA ribotyping, sources will be identified specifically according to species of animal, i.e. human, swine, bovine, deer. This information will be used in targeting management strategies for TMDL development.

A low level mercury study is underway sampling in selected piedmont and coastal waters for total mercury and methyl mercury. In addition to the instream sampling, 40 NPDES facilities have also contributed effluent samples to provide some background information. Data from the fish tissue, instream water column and sediment samples will be used for translator development and TMDL purposes. This study is scheduled to end in August 2003; however, an extension/expansion request has been prepared to take sampling into 2005 and to address other waters.

Staff will also be taking on a major sampling effort in the Lower Cape Fear River for development of a dissolved oxygen TMDL. Dye, SOD, BOD, physical, chemical and flow measurements will be made on the Cape Fear, Northeast Cape Fear, South and Black Rivers. DWQ modelers are currently working to develop a partnership with researchers in the area to assist with model development.

This summer ISU will be chasing storms in three basins in order to get data for development of sediment TMDLs. Twenty-two locations are on the agenda for this year with the goal of sampling three storm events. Water samples will be collected on three consecutive days, making this an interesting study to work in with the rest of our sampling. Needless to say it won't be a boring year.

Finally, we will be doing follow-up sampling on biologically impaired streams. For the ISU this involves pre-survey of the watershed, physical and chemical sampling and may require taking samples for toxicity testing. This work will be coordinated with the Biological Assessment and Aquatic Toxicity units.

AQUATIC TOXICOLOGY UNIT

The Aquatic Toxicology Unit has been dealing with staff shortages as have the rest of DWQ and other Region 4 states. Fortunately, the Unit is currently interviewing for its single vacant position and looks forward to being at full staff.

Sandy Mort recently conducted evaluations of the latest total residual chlorine detection technology from Hach. The instruments evaluated were the AutoCat 9000, an automated amperometric titration device and the DR/2400 portable spectrophotometer. As is to be expected, the instruments' detection limits in "real-world" matrices were somewhat higher than the instruments' factory-rated detection limits. For more information, please contact Sandy at (919) 733-2136 or sandy.mort@ncmail.net. This is a critical issue for NC due to the recent adoption of a water quality standard of 17 µg/L for TRC.

At the beginning of 2001, the Division of Water Quality implemented its revised procedures for addressing NPDES facilities that show reasonable to potential to cause instream violations of our Action Level Standards for copper and zinc. The revised procedure is initiated when a facility produces two noncompliant toxicity results in a three-month period and reasonable potential evaluation of effluent monitoring data indicates a potential to exceed the Action Level Standard for copper or zinc in the receiving stream. At this point, the facility has nine months to undertake investigations to determine whether the metal in question is the source of toxicity. These investigations most often take the form of toxicity identification evaluations (TIEs). If the

investigations indicate the metal to be the source of toxicity or are inconclusive, the NPDES permit is re-opened and a limit for the metal is added. Given that the toxicity of these two metals is heavily matrix dependent (solids, hardness, total organic carbon), the Action Level strategy allows a mechanism to apply permit limits only to those facilities where toxicity is associated with the metal. An additional benefit of the strategy is that, in the face of a metal permit limit, many facilities begin TIE work more diligently after toxicity noncompliances occur and thus more quickly resolve toxicity problems, regardless of the source of toxicity. Twenty-five facilities have become subject to this process over the least two years. In five cases, the Aquatic Toxicology Unit has recommended the implementation of a metal permit limit. Two facilities conducted TIE work that clearly indicated a toxicant other than a metal. Three facilities connected to municipal systems prior to the end of the process. Decisions on three facilities are pending review of their final reports. Eleven facilities had no further toxicity events over the allotted nine-month period following the two noncompliances that initiated the process and could not conduct TIE work. Though no permit limits are implemented, the facilities remain subject to the strategy; any further toxicity occurrences will initiate the process again.

The Unit is coordinating data collection for the purpose of having its alternate *Ceriodaphnia* chronic method approved by Region 4.

News from South Carolina

Department of Health and Environmental Control

Macroinvertebrate Group

We have completed our winter swamp sampling in the Middle Atlantic Coastal Plain of South Carolina. We are working mostly in the Pee Dee Basin this year but have also examined some random sites outside the basin. After a four-year drought here in the southeast we have finally been getting rain. In fact, many of our streams are now flooded. A good many sites were added in the Pee Dee Basin this year. The long-term effect of last year's drought on our aquatic fauna is a question that is often pondered. Many of the streams we sampled this winter had good flow and habitat but poor macroinvertebrate communities. Some were probably dry for much of last year.

Two of the new species of caddisflies that we have discovered over the last several years were recovered again this winter in the Pee Dee Basin, extending their range northward in our state. The new *Rhyacophila* species is turning up in many of our swamp streams. It apparently is rather common in Coastal Plain Streams throughout the southeast but remained unnamed because the larvae resemble *Rhyacophila lobifera* and the adults emerged very early in the year before most entomologist begin light trapping. I now have records from North Carolina, South Carolina, and Florida. A new sponge feeding *Ceraclea* that we had found from only one location was also collected in fair numbers from a stream in the Pee Dee basin.

I have just returned from the National Biological Assessment and Criteria Workshop in Coeur d'Alene Idaho. It was good seeing all of my fellow Region IV colleagues at the meeting and sharing some excellent conversation both at the meetings and in the pubs. I personally found the meeting very informative and came back with many ideas I hope we can implement here in South Carolina. It was particularly nice seeing a number of staff from Region IV leading sessions and presenting papers.

For more information on the macroinvertebrate program in South Carolina contact:

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Phycology Program

The Phycology Program staff truly enjoyed the 2002 SWPBA meeting in Panama City Beach last October. There were an excellent variety of presentations during the day, and the opportunity to socialize and Atalk shop≡ with our SWPBA friends in the evenings was not to be missed. We would like to say thank you very much to our colleagues in Florida for hosting the meeting!

The period since the SWPBA meeting has been devoted to assessing the activities of the past sampling season. Summary reports for chlorophyll analyses and the Harmful Algal Bloom Monitoring and Surveillance Program

have been completed. We are still busy analyzing phytoplankton samples collected from the ambient monitoring network in 2002 and most of our time currently is devoted to completing analyses of these samples.

In the ambient monitoring program for chlorophyll, we plan to sample 95 stations in lakes and estuaries once per month May through October. An additional 60 stations will be sampled once for the South Carolina Estuarine and Coastal Assessment Program (SCECAP). Of course, we expect an undetermined number of phytoplankton samples from fish kills, algal blooms, etc.

Continuing a tradition for this section of the SWPBA newsletter, we would like to relate a case history of some interest from a phycology standpoint. On April 23, 2003 we investigated an algal bloom in an old millpond that was being managed for waterfowl. Each year the pond has been drained, a mix of grains favorable for waterfowl has been planted in the pond bed, and the shallow pond (≤ 1 m) has been impounded again after the grain matures. The gentleman who owns the pond complained about algae covering everything in the pond, and he was concerned that the algae would interfere with the ducks' feeding and cause them to leave. In fact, he believed that the ducks left early this year because of the algae. The owner believed the reason for the algal bloom could be nutrient loading from two small treatment facilities upstream from the pond.

When we went to the pond to assess conditions, the pond had already been drained for the grain-planting season. However, there were still some large pools in the pond bed that contained green filamentous algae that the pond owner identified as the offending material. The owner also pointed out considerable areas on the pond bed where the remnants of the algal bloom did completely cover the pond bottom. The dried material had a curiously parchment-like consistency.

Some of the fresh algae was collected and identified in the lab as a mix of *Spirogyra* sp. and *Zygnema* sp. Interestingly, these different algal genera are in the same family, and species of them may grow abundantly in shallow water rich in organic acids and where there is a large amount of decaying vegetation. The aquatic environment in the millpond, then, likely was favorable for these algal blooms. The stands of grain that were flooded annually and wastes from large flocks of ducks should have provided an abundant source of organic materials, notwithstanding other sources. Any nutrient loading via the tributary streams could have been a factor that enhanced existing algal growth to some degree. However, it appeared the management practices for the pond by themselves were sufficient to promote nuisance algal blooms.

This information was forwarded to our Watershed Manager who is working with the pond owner on this matter. Of course, the bottom line for the pond owner is whether algal blooms will interfere with the waterfowl management. Hopefully, we will have provided him some insight as to why the algal blooms occur. We have also contacted the South Carolina Department of Natural Resources to see if they have some experience with algal blooms in waterfowl ponds and how it might affect their management.

NPS Monitoring Team

The budget woes continue for the NPS Team. Brad Martin decided to take another position, and before his computer was turned off his position had been eliminated. So we are now down to two full time positions in the monitoring team.

Work continues on several small studies looking at individual stations listed on the states 303(d) list. One four year long 319 study is coming to the end of the monitoring phase, and will be written up and in print by the end of the year.

That is about all there is to report at this time. If you need to contact me I am at:

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News from Tennessee

Tennessee Department of Environment and Conservation Central Office

Biological Criteria

Tennessee has proposed the incorporation of numeric biocriteria for Wadeable streams based on ecoregion reference data in the water quality standards. We are currently in the public hearing phase. Seems the regulated community thinks the criteria are too strict and the environmental groups think they are not protective enough.

We are already using the proposed biocriteria as a guidance for conducting stream assessments and are finding it works great!! We use a single habitat sample (riffle kicks in riffle streams and rooted bank in non-riffle streams). We found the single habitat approach easier to standardize between multiple field offices, consultants, the regulated community and everyone else involved. It is also easier to defend since it reduces subjectivity.

We developed and are testing a multi-metric index based on 7 metrics. It was hard to come up with 7 biometrics that worked well in all bioregions for all pollution types !! We wound up with Taxa richness, EPT richness, Percent EPT, Percent oligochaetes and chironomids, North Carolina Biotic Index, Percent dominant and Percent clingers. Of these, percent dominant is the weakest. The oligochaetes and chironomids does not work well in all situations, but it is the most sensitive metric in the western bioregions so we decided to keep it. We did have to adjust the index for the Mississippi Alluvial Plain. We only use 5 of the metrics in that region since there were not enough EPT in the reference streams to make EPT metrics useful.

Our original 25 ecological subregions, which grew to 28 after delineation of surrounding states (thanks a bunch guys!), were combined into 15 bioregions. Although this sounds like a lot, we decided when in doubt split instead of when in doubt group. This is easier to defend since most of the regulated community doesn't like the concept of using ecoregion references instead of an upstream reference.

Nutrient levels and macroinvertebrates

We recently finished a study trying to correlate nutrient levels with macroinvertebrate populations in the Inner Nashville Basin. Canopy cover proved the key. A strong relationship was identified between percent canopy cover, nitrate+nitrite, total phosphorus and the macroinvertebrate community. High nutrient levels in streams where heavy canopy prevented sunlight penetration and therefore excessive algal growth appeared to have little affect on the benthic population.

On-line Assessment Database

Tennessee's water quality assessment database is now online in the form of an interactive map. The website provides GIS-based public access to assessment data for individual waterbody segments such as the degree of use support, location information, and the general basis for the assessment. The site can also be used to generate color maps. You can find it at <http://www.state.tn.us/environment/water>

More web site stuff

In the last year, we have been busy putting reports on our web site. These can be found by going to our web site (see above) than to program areas, division of water pollution control, WPC publications. Some of the good stuff put up there recently includes:

- *2002 305(b) Report The Status of Water Quality in Tennessee*
- *Staff Proposal for 2001 Triennial Review of Water Quality Standards*
- *Proposed Final 2002 303(d) List*
- *Development of Regionally-Based pH Criteria for Wadeable Streams in Tennessee*
- *Evaluation of Regional Dissolved Oxygen Patterns of Wadeable Streams in Tennessee Based on Diurnal and Daytime Monitoring*
- *Dioxin Levels in Pigeon River Fish 1996-2002*
- *TDEC Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys*
- *Habitat Quality of Least-Impacted Streams in Tennessee*
- *Development of Regionally-Based Numeric Interpretations of Tennessee's Narrative Biological Integrity Criterion*
- *Development of Regionally-Based Interpretations of Tennessee's Narrative Nutrient Criterion*
- *Tennessee Ecoregion Project 1994-1999*

STORET

We have finally broken the STORET barrier! In March we submitted our first batch of data. By the time you read this most of the chemical data collected in 2000 through 2002 should be accessible by the masses. (Or at least by anyone that can figure out how to download information).

Tennessee Department of Health Aquatic Toxicology Section

Benthic Taxonomy

Full shelves of RBPIII samples have been rapidly emptying this past 6 months. With two new biologists, Tamika Douglas and Greg Harris in the section, we are getting back up to speed. RBPIII and Biorecon samples Aquatic Biology collected from the Upper Duck River watershed in fall of 2001 have all been identified, biometrics run, and have been scored under the statewide Macroinvertebrate S.O.P. Likewise, all Upper Clinch-Powell Rivers watershed RBPIII and Biorecon samples have been finished. Additionally, we have analyzed many RBPIII for enforcement, sent in by the TDEC Environmental Assistance Centers, and a few samples for the Department of Agriculture.

We have completed our first Macroinvertebrate taxonomy QCs, serving as a QC resource for TDEC Environmental Assistance Center biologists covered up with other work.

Benthic Collections

Our large project for the fall of 2002 was the Upper Clinch-Powell watershed collections. A total of 64 sites were visited for macroinvertebrate and other collections. Still being understaffed, our biologists worked long days and consecutive weeks in the field to complete the project.

Fall 2002 and spring 2003 collections of various Ecoregion sites were made, including RBPIII, Biorecon, chemical with flow measure, and bacteriological samples. The same sites were visited for chemical sampling in winter.

Toxicity Testing

Aquatic Biology now runs its Toxicity Program for 6 months each year, which saves a great deal of test organism culturing time. One set of tests in February had to be rescheduled when the test fish could not be delivered to us because of snow and ice. Otherwise all has gone well and we've completed chronic Cd and Pp tests for 7 facilities and are presently conducting 3 more. Tests for one facility were performed under a permit not yet rewritten for the IC25 endpoint. It was fun figuring out the new EPA variability criteria review step for the NOEC!