
E.P.A. Region IV
SWPBA
Southeastern Water Pollution Biologists Association

JUNE 2001

President's Letter,

The weather seems to be the best topic for starting one of these letters, for some reason. Kentucky was staring another moderate to severe drought directly in the face until mid-May when we finally got significant rainfall. And we may now actually have water to sample this year. I'm betting that most of you are heavy into the field season while we up north are just rounding up our gear.

So, you want to come to Kentucky in the fall, but just don't know how? Let me tell you all about it. That means I get to save the constitution stuff for later.

University Plaza Hotel and Convention Center
1021 Wilkinson Trace
Bowling Green, KY 42103
Phone: (800) 801-1777

We have a block of 44 rooms reserved at $79.00 per room (1-4 people, same price) with "Full, complimentary breakfast to be included with each paid guest room (no more than 2 per room)." All guest room rates are subject to applicable taxes. Current tax is 10.245% and is subject to change without notice.

You are responsible for making your own reservations with the hotel. All reservations must be received by the University Plaza Hotel prior to September 29, 2001 to ensure you get in the group room block and rates.

CALL FOR PAPERS. This is the first official call for papers. Please submit a title/topic to me at any time at susan.cohn@mail.state.ky.us . The earlier we get an idea of how many people might want to talk about what, the easier it will be to recruit others for any particular session. Some of the topic requests from last year were stream bank restoration, coal slurry spill/Kentucky disaster updates, a "Dave" session….

POSTERS. We will not be able to hang posters onto function space walls. If you wish to bring a poster, please notify me so we can have something to hang it on, or bring your own stand. There is room, just not on the walls, for posters.

WORKSHOPS. The workshop scene is falling into place. We have invited Florence Fulk from U.S. EPA in Cincinnati to talk about new developments in whole effluent toxicity guidance documents as a result of recent litigation settlements. Also, Guenter Schuster will run a taxonomic identification workshop on hydropsychid caddisflies. The workshop will place emphasis on the species of the Genera *Hydropsyche* and *Ceratopsyche*. The workshop will be held on Tuesday afternoon from 1:00 to 4:30 PM. Interested parties are encouraged to bring dissecting scopes and lights, and troublesome specimens.

T-SHIRTS. T-shirts will be sold as always. **A preliminary design can be viewed at the end of this newsletter (after Tennessee)**. The cost will be $10.00, unless you order an oversize one. Add $1.00 for each additional X (the first X is not extra). Also, we are planning to order pint beer glasses with the SWPBA logo on it. These are expected to run about $6.00 apiece. Is that too much? Order forms are coming soon. T-shirt design is posted with this newsletter.

BANQUET. **Halloween Costume Party** October 31. Prizes for best costumes to be awarded! How are your ideas developing? Our own local musician, Secretary Greg Pond, will be mixing the music for the party, so if you have requests, get them to him in September. We will have a buffet dinner and dance/party following.

MAMMOTH CAVE. Field trip scheduled for Tuesday evening. This is an optional event. After the workshops we will break for dinner and then load up into vans for a 40-minute drive to the park. We are hoping for a guided tour by some of the park biologists and then return to the hotel. If we leave by 6:00, we can start the tour by 7:00, head back to the hotel by 9:00 and hit the hospitality room.

Tuesday will be busy, we know. But, we don't have the beach so we wanted to keep everyone entertained. Wednesday will be a regular day, with the costume party to top it off. Thursday morning will wrap up all remaining talks and the business meeting.

Speaking of business, the last thing to be wrapped up from last year's business meeting was an additional change in the constitution (not the by-laws—sorry Neil). You should have received a draft paragraph on the subject of Emeritus Membership in mid-May. However, I will reprint it here.

> "Emeritus Membership status may be awarded by a majority vote of the membership in attendance at the annual meeting. Nomination of candidates for consideration for emeritus membership must be made by current general members and shall be submitted for inclusion in the newsletter prior to the annual meeting, along with a justification in support of the nominee. Candidates for emeritus membership must be individuals who qualify for general membership as outlined in article 3 of this constitution, and have retired from one of the eligible entities listed in article 3 of this constitution, with a sufficient amount of service so as to qualify for retirement benefits. Emeritus members are encouraged to attend the annual meetings. Emeritus members cannot hold elected office, but may serve on committees. Emeritus members will have the privilege of the floor during the business meeting, but cannot present nor second motions, nor do emeritus members have the right to vote, to forward nominations for elected officers, or to nominate others for emeritus membership. Emeritus member contact information will be maintained on the membership list, and emeritus members shall receive the newsletter and invitations to the annual meeting."

I requested that all comments be sent to me so they could be incorporated in this newsletter. So far, the only comments I have received came from Mike Beiser in MS. They are as follows:

"1. Emeritus Membership status may be awarded by a TWO-THIRDS vote of the membership in attendance at the annual meeting.

JUSTIFICATION: Emeritus Membership should be viewed as an honor for service to the Association as well as one's state or federal agency.

2. Emeritus Members are encouraged to attend the annual meetings, and as such are exempt from the registration fees for said annual meetings.

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JUSTIFICATION: Waiver of the registration fee is the LEAST we can do for those who have served so long and so well. If we are encouraging the emeritus members to attend our annual meeting, then there should be some incentive.

3. " . . with a sufficient amount of service so as to qualify for FULL retirement benefits, PROVIDED THAT THERE IS NO CONFLICT OF INTEREST PRESENT BETWEEN EMERITUS MEMBERSHIP STATUS AND AN EMPLOYER IF THE CANDIDATE FOR EMERITUS MEMBERSHIP HAS ACCEPTED A POSITION IN THE PRIVATE SECTOR.

JUSTIFICATION: See my comments in the introduction above."

Most of these comments make sense to me. My only concern is with Comment 2 that would write into the constitution that registration fees are waived. If we get a large contingent of emeritus members, it should be up to the host-state how many can attend gratis. This could conceivably become a rather large burden in the not too distant future for us to just absorb, depending on participation. Needless to say, I am new to who should and should not pay so just trying to generate discussion on this point.

Also, I think Beiser sent these to everyone and I have not received any further discussion on this. So, at this point, is there further discussion?

Sincerely,

Susan Cohn, 2001 President

News from ALABAMA

Reservoir Water Quality Monitoring (RWQM) Program

An intensive water quality survey of Coosa, Tallapoosa, and Alabama River reservoirs was completed during October 2000. Fifty-one tributary embayments of these reservoirs were monitored during April, June, and August. Thirty-three mainstem reservoir locations were monitored monthly April-October to collect additional data needed for development of lake-specific water quality standards. Algal growth potential tests were conducted on samples collected during August from thirty-nine stations on these reservoirs.

Seventeen mainstem reservoir and tributary embayment locations in the Black Warrior River basin were monitored once during August in accordance with the two-year monitoring rotation of all lakes in the state.

Completion of the draft report for the 1999 Intensive Water Quality Survey of the Chattahoochee and Conecuh River Reservoirs is scheduled for June 2001.

An intensive water quality survey of thirty-three mainstem reservoir and tributary embayment locations in the Tombigbee and Escatawpa Rivers basins began March 2001 with reconnaissance of sampling locations. Sampling will be conducted monthly April-October at all locations.

The ADEM recently adopted lake-specific water quality criteria to enhance nutrient management in lakes. The goal of the criteria is to establish lake nutrient targets necessary to maintain and protect existing uses. The targets will be expressed as chlorophyll a criteria in order to address the biological effect of nutrients to lakes. Initially, criteria have been developed for Weiss, Harris, West Point, and Walter F. George Reservoirs with criteria for the remaining eutrophic reservoirs to follow. Criteria will eventually be developed for all publicly owned lakes in the state.

For further information on the RWQM Program contact Fred Leslie at (334) 260-2752 or fal@adem.state.al.us.

Fish Tissue Monitoring Program

The results of the analyzes conducted on fish collected in the fall of 2000 have been forwarded to the Alabama Department of Public Health and should be available upon request. For further information on the Fish Tissue Monitoring Program contact Chris Smith at (334) 260-2753or ces@adem.state.al.us.

Point / Nonpoint Source Assessment Programs

The basin rotation schedule includes the Tombigbee and Escatawpa Rivers, and Mobile Bay. The Soil and Water Conservation Districts' *Conservation Assessments* were used to focus our monitoring efforts in those subwatersheds with the highest potential for nonpoint source impairment. Approximately **forty (40) subwatersheds** were selected for habitat and aquatic macroinvertebrate screening assessments which were initiated May 1, 2001. Upon completion of these assessments and analysis of the data, sites will be selected for additional bioassessment using fish IBI assessments. All sites that are determined to have a "poor" aquatic community will be assessed using chemical water quality parameters to attempt to determine the cause. For more information contact Lisa Houston or Brien Diggs at (334) 260-2700

The 1999 water quality assessment of the Chattahoochee, Choctawhatchee, Chipola, and Perdido-Escambia River Basins is in the reporting phase. The study area encompassed twenty

counties in southeast Alabama. The area included sixteen hydrologic cataloging units which comprised 137 sub-watersheds and 11,303 square miles of drainage. To focus on non-point source pollution and areas that have not been studied with the past five years, EIS created an Arcview project with point source and previous study data layers. Then utilizing the Conservation Worksheets provided by the Local Soil and Water Conservation Districts, twenty-seven sub-watersheds were selected for study. Upon selection of the sub-watersheds, wadeable streams within each of the sub-watersheds were selected for assessment. EIS conducted fifty macroinvertebrate community surveys/ twenty-seven fish community surveys, and collected chemical samples at twenty-seven locations.

Data Management/Storage

Development of the Department's Surface Water Quality Database (SWQD) is still underway. New contract programmers are re-designing the system in Oracle to be more compatible with the new STORET system. The next phase will include user testing and editing of the help files and user documentation. For more information on this project contact Vickie Hulcher at vjh@adem.state.al.us or 334-260-2700.

Bioassay Program

Our commitments for FY01 have been met so we are helping out in other programs until we get started on next year's commitment list.

We are please to welcome Mike Stowe to the Bioassay Unit. He will be working in the bioassay program and assisting in most of the other programs during the busy sampling seasons.

Just a Few Changes

We have had a few changes here in the Montgomery Branch of Field Operations since our last newsletter. Our long-time leader, **Bob Cooner**, opted for the retired life after 25+ year of service to the State of Alabama, all in the Montgomery Branch. He composed a letter to all of you before leaving and asked that it be submitted with our next article (see below). John Chitwood, formerly of the Compliance Section in the Montgomery Branch, has been promoted to fill Bob's position. The stream monitoring, bioassessment, reservoir monitoring, and fish tissue programs are now under the Aquatic Assessment Unit (a new entity!), led by our own Fred Leslie. Brent Watson has transferred to the Air Division to become a permit writer and we welcome two new staff to the Aquatic Assessment Unit, Hugh Cox and Keith Gilliland. Both are scheduled to come on board within the next couple of weeks. We hope to be able to bring at least one of them to the SWPBA meeting this year!

" A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise. " **Aldo Leopold**

An Open Letter to the Membership of SWPBA, my Fellow State and Federal Aquatic Biologists:

After 25 years of public service, many of them spent as an aquatic field biologist, I have retired. Though I am looking forward to what the future may hold, I will forever treasure the experiences, friendships made, and memories of my time with state government.

I think I was fortunate to begin my career when, as a biologist in an engineer driven water pollution control program, I got excited at just being able to dangle two or three Hester-Dendy plate samplers at a few stream sites and call it biological sampling. I could not have imagined then, in the mid to late 70's, how our profession would evolve in the coming years. A core group of EPA Region 4 Biologists in Athens, GA were driven to mentor young state biologists and impress upon them the importance and nuances of implementing biological assessment into their

state programs. Tebo, Raschke, Peltier, Weldon, Howard, Fry, Schultz, Smith, Hicks, Murphy. Names that I hesitate to mention, because I know I have left someone out, but names that are worthy of note, because these gentlemen were the igniters. I well remember something Tebo said to my immediate supervisor at an early SWPBA meeting in Gulf Shores, AL. Our supervisor was bemoaning the fact that we were short of resources and needed more direction from EPA before beginning implementation of additional bioassessment into our program. Tebo told him, within earshot of all of us, " Stop whining and get off your butt (an editorial insertion as I don't remember Tebo saying butt, but something else) and get started". Meaning, work with what you have, be innovative, and make a contribution. To Tim Forrester, Marion Bertolotti and me, that was a rallying cry. Though not always with the full blessings of the agency, instead of whining, we began looking for a crack here, an open door there, to enhance our biological assessment programs. With the dedication of the great staff members we have been so fortunate to have with us through the years, the result has been what was unthinkable in 1977. We're still short of resources, but can take pride in having a varied and respected bioassessment program that is providing information week to week, month to month, year to year, valuable to our water quality management and protection efforts.

But Alabama is certainly not alone in the strides we have made. We still look with envy at some of our sister state's programs, those that are richer than we in staff and resources. However, these programs neither just happened. They are the result of similar dedication and conscientious effort by many within all of the state's water pollution control programs. All of these strong programs are also a result of SWPBA. An organization begun by a few truly visionary state and federal biologists over 25 years ago that realized the importance of regular communication, joint development of differing yet similar sampling methods, the sharing of results and professional camaraderie. Folks, the reason that Region 4 states have the most comprehensive, respected biological assessment capability in the nation is not by coincidence or accident.

Aquatic biologists are members of a unique fraternity, or sorority as the case may be. They certainly play hard, just take note at an annual SWPBA meeting, but there is not a harder working group of professionals within the environmental field. This comes from really believing in what you are doing and the contributions made. Long hours in the field in all kinds of weather tend to toughen a person up, mentally and physically. This has served us well as we have fought for insertion of our applied scientific methods into traditionally chemical based programs and recognition of our contributions.

However, just as in life, it is true in careers, we all come and go. Though not a member of the original group that began SWPBA, my back has become rather mossy, and now it is my time to move on to new challenges away from state service. I am proud to have been associated with such a dedicated group of professionals and hope that any contributions I may have made to the profession of aquatic biology and its use in water pollution control programs have been looked at as being positive.

Hopefully as an alumnus, I can look forward to receiving the SWPBA Newsletter. I will eagerly look forward to reading of your most recent accomplishments and escapades. In closing, I salute all of you and may God grant his richest blessings to each of you and your families for your dedication to public service and to the protection of our environment, His creation.

Bob Cooner, retired
Field Operations Division
ADEM

Florida Department of Environmental Protection

News from the Central Biology Lab – Tallahassee

Invertebrate Zoology Subsection

Statewide Macroinvertebrate Taxonomic QC Program
This program is intended to examine the ability of the FDEP invertebrate taxonomists as a whole to accurately identify taxa within a desirable error rate and to delineate those taxa that may present particular analytical difficulties, thereby suggesting the need for additional training or experience. This program will utilize the expertise of statewide taxonomists to provide a quality assurance evaluation of data using a peer review of performance over time. These data will contribute to the larger effort to defend the use of biological metrics in examining the impairment status of water bodies of the state. *All analysts generating taxonomic data for FDEP should eventually participate in the QC program.* The target performance criterion will be maintenance of a correct identification rate equal to 95% of the cumulative number of individuals identified in all QC samples in the last four quarters.

Springs Monitoring Program
With nearly 600 springs, Florida may boast the largest concentration of freshwater springs in the world. In addition to their natural beauty, springs represent a multi-million dollar tourist industry and support various other commercial enterprises as well. Between 1950 and 1990 the population of Florida quadrupled, and continues to expand rapidly. Increasing water usage and land use changes have resulted in significant decreases in flow discharge and water quality within the springs, particularly with respect to nutrients. A multi-agency Springs Task Force was formed to study and recommend strategies on how to best protect and restore Florida's springs. A quarterly monitoring program was developed to detect and document long-term trends in water quality and quantity, to support research efforts, and to confirm the effectiveness of protection efforts. The Invertebrate Zoology Subsection is involved in the sampling and is currently identifying the macroinvertebrates from the second quarterly sampling.

Apalachicola River Low-Water Study
Hydrologic modifications from damming and consumptive uses along the Apalachicola-Chattahoochee-Flint River systems have reduced the amount of water delivered into Florida. This reduction, especially during periods of low flow, has Florida residents and regulators concerned about potential effects on aquatic life in the Apalachicola River, its associated slough systems, and in Apalachicola Bay. A study was designed to investigate the effects of low water levels on habitat availability and biological health in selected sloughs of the river. The first sampling was completed in July of 2000 to determine a baseline condition at the lowest water levels in the river. Sampled parameters included habitat assessments, habitat mapping, and macroinvertebrate Stream Condition Index sampling at twenty-four sites in four slough systems. The Invertebrate Zoology Subsection was involved in field sampling effort and is currently processing the macroinvertebrates from the initial sampling. Further sampling, at different water levels is anticipated this year.

Inshore Marine Monitoring and Assessment Program (IMAP)
IMAP is a collaborative project between State and Federal agencies designed to assess the ecological condition of Florida's inshore waters. A key element of the project is to translate environmental monitoring data into assessments of ecological condition and forecasts using

biological indicators. IMAP samples on two different scales: statewide and regional. The regions correspond to Florida's 5 Water Management Districts. A total of 180 samples are collected each year during a late summer index period: 150 samples are from the regional sampling units, with an additional 30 samples from the statewide areas. The Invertebrate Zoology Subsection is currently processing the macroinvertebrate samples from the first year's sampling effort.

Joy Jackson of the Invertebrate Zoology Subsection can be contacted via email or phone.
Email: Joy.Jackson@dep.state.fl.us Phone: 850-922-2469

Algal Biology Subsection
The Algal Biology Subsection is performing identifications on qualitative periphyton samples in support of the Springs Monitoring Program to complement the invertebrate data. We continue to provide identifications for the Everglades and TMDL projects as well as several other smaller projects that were mentioned in the last newsletter. We are working on building up our library of algal photographs and hope to incorporate many of these into the electronic keys we are working on. These keys will be for our internal use and should help with training new taxonomists. Were trying to narrow things down to the species we commonly encounter since there aren't many keys written specifically for algae of Florida at this time. Instead of having three or four books to look through, the electronic keys would summarize all of the references and help to narrow down the choices.

Elizabeth Miller of the Algal Biology Subsection can be contacted via email or phone.
Email: Elizabeth.B.Miller@dep.state.fl.us Phone: 850-921-9826

Toxicology Subsection
Greetings from the FDEP Toxicology sub-section of the FDEP Biology section. Since the last newsletter, we have initiated but not completed several major changes in our laboratory. After mid-July, we anticipate no longer culturing any test organisms except for *C. dubia*. We will purchase test organisms from private vendors.

We will be constructing a dedicated sediment bioassay area in our facility. Our experience with sediment toxicity testing has been very limited. Any suggestions on how to avoid generally known or personally experienced pitfalls in sediment-test area design or sediment testing would be appreciated.

Yasser Kattan, an employee of the ARAMCO Corporation, has almost completed his one year internship with our toxicology group. His experience includes researching environmental contamination by hydrocarbons, participation in oil spill cleanup during the Gulf War, and performing bioassays of samples of various drilling muds. He will be returning to Saudi Arabia to establish a toxicology laboratory at ARAMCO. This laboratory will be the cornerstone of a Mid-East regional toxicology laboratory network. Best Wishes Yasser.

Marshall Faircloth of the Toxicology Subsection can be contacted via email or phone.
Email: Joseph.Faircloth@dep.state.fl.us Phone: 850-921-9820

Bench Biology Subsection
The Bench Biology subsection of FDEP Bureau of Laboratories analyzes samples for chlorophyll, Biochemical Oxygen Demand (BOD), sediment grain size and algal growth potential. How the exact term "Bench" Biology evolved is somewhat of a mystery but it is important to note that this subsection has gone through a series of name changes and it is hoped

that this name will not be abducted by other groups as previous names have. My guess is that we do not have anything to worry about this time around.

The bulk of this subsection's workload is performing chlorophyll analyses for various projects from the six DEP districts and five water management districts in the State of Florida. Currently, we report chlorophyll a and pheophytin using a spectrophotometer and 90% acetone solvent as described by SM 10200 H. The lab recently purchased a bench fluorometer (appropriately named) and will begin using it to hopefully reduce the time it takes to concentrate samples and be able to achieve lower detection limits. We here in the Bench Biology subsection are always looking for ways to simplify problem solving so if anyone has any suggestions, comments or complaints with regards to fluorometric methods, we'd be glad to hear from you.

The algal growth potential and limiting nutrient (AGP/LN) tests have continued to be a substantial portion of the overall sample load in this subsection. During the last year, we were able to complete 1,147 tests. Of those tests, 983 were for algal growth potential and 164 were limiting nutrient tests. The majority of the limiting nutrient tests were routine Everglades samples analyzed for the South Florida Water Management District (SFWMD). Due to a recent computer platform change, we are in the process of installing and utilizing new data management software that we hope will not slow us down too much during the initial launching phase. The software was built in-house as a module of our current LIMS system so on-site customization is possible if we can just track down those who created it.

Smaller parts of our sample load but important nonetheless are the grain size analyses and BOD. The majority of our sediment grain size tests are analyzed using a laser diffraction instrument manufactured by Beckman Coulter. This instrument gives the user a continuous particle distribution by volume from 0.04 to 2000 µm within 90 seconds. For investigators that still like their grain size delivered by weight, we continue to run samples by sieve. To determine sediment percent organics we use a muffle furnace that cooks sediment samples at 550° C for 4 hours. On rare occasions, the analyst in charge of this analysis becomes hero for the day when they cook a highly organic sample and set the fire alarm off accidentally. The BOD and CBOD tests we receive are primarily ambient surface waters comparing a reference site with a test site. Occasionally, we receive samples taken during a time series for use in modeling studies.

Rob Buda of the Bench Biology Subsection can be contacted via e-mail or phone.
Email address: Rob.Buda@dep.state.fl.us phone 850-921-9827

Microbiology Subsection

Since October 1998, the microbiology lab has been involved in the ambient monitoring study. The project entails the use of 4 tests, which are enterococci, fecal and total coliform, and E. coli. The information we generate from the study will identify the bacterial indicator(s) that is best to determine the nature of pollution in fresh and marine surface waters and bathing, beaches.

In addition, the micro lab has been analyzing drinking water samples for the U.S. Forestry Service and the Dept of Natural Resources. The chromogenic substrate coliform test is used to test these samples

Melva Campos of the Microbiology Subsection can be contacted via e-mail or phone.
Email address: Melva.Campos@dep.state.fl.us phone 850-921-9818

Georgia Department of Natural Resources
Environmental Protection Division
Water Protection Branch
Watershed Planning and Monitoring Program

As usual, I find myself waiting until the last minute to pull everything together for a submission. I started 3 weeks ago with a memo to all of the SWPBA members around here, notifying them of this issue and asking for input. Well, they must all be out in the field, so look forward to a bare bones update. We have found a few new people this reporting period, lost an old one, and had the legislature promise us a bunch more. Who wants a job here in the Peach State with the Georgia EPD?

We're looking forward to the yearly conference in Kentucky over Halloween. What? No beach? Guess we will make do. Our sincere thanks go out to Kentucky for acting as host organization this year. Preliminary planning looks good.

Summer sampling is in full swing in Georgia, and yes, we're having another drought year. We have lake work ongoing on nine different reservoirs. Tributary gageing and sampling is being conducted because of lake and drought issues. TMDL sampling work is still in full swing and basin lake work focuses on the Coosa-Tallapoosa-Tennesee Basin Group. Read on to see what's up here in Georgia for 2001.

Significant Activities:

As ordered by U.S. District Court Judge Marvin Shoob in a September 2000 ruling, the Environmental Protection Division finalized the submission of 124 Total Maximum Daily Load (TMDL) Implementation Plans. With the help of the 16 Regional Development Centers (RDCs) in the state, TMDL Implementation Plans were developed for 101 fecal coliform bacteria TMDLs, 8 Dissolved Oxygen TMDLs, and 15 Fish Consumption TMDLs. The final plans were submitted to Judge Shoob on April 19, 2001.

The University of Georgia and Georgia Department of Community Affairs sponsored a scoping workshop for Georgia's Project NEMO. NEMO stands for Nonpoint Education for Municipal Officials. NEMO is an educational program for land use decision makers that addresses the relationship between land use and natural resource protection, with a focus on water resources. NEMO was created in 1991 by the University of Connecticut Cooperative Extension System and has expanded to a national network of programs, which include Alabama, South Carolina, North Carolina, and currently a small pilot project has been funded for Coastal Georgia. Several local, state and Federal organizations attended the scoping workshop and discussed the need and potential success of NEMO in Georgia. The first order of business is to establish a workgroup to begin the focus of how NEMO fits into Georgia. The workgroup has not been finalized as of yet, but they will be meeting in the near future to discuss the particulars involved with getting the project up and running. DCA and UGA are co-organizing the initial meetings of the workgroup. Additional information on NEMO can be found at http://nemo.uconn.edu.

The Section 319(h) FY2000 Nonpoint Source Implementation Grant award notification was received on April 18, 2001 for $4,621,600.00 for seventeen projects that will prevent, control and/or abate nonpoint sources of pollution. Subgrantees include Georgia Soil and Water Conservation Commission, Georgia Forestry Commission, University of Georgia, Columbus State University, Habersham County, City of Griffin, Coastal Georgia Regional Development

Center, Chestatee-Chattahoochee Resource Conservation & Development Council (RC&D), Seven Rivers RC&D, Oconee River RC&D, and Coastal Georgia RC&D.

As part of its enforcement program, PCEP issued two consent orders, one expedited enforcement compliance order, and collected $27,600 in penalties.

The Suwannee River Interbasin Alliance (consisting of the Suwannee River Water Management District, Florida Department of Environmental Regulation, the U. S. Fish and Wildlife Service, and the Department of Natural Resources) sponsored a research symposium on the Suwannee River in Live Oak, Florida. The conference was titled "Four Rivers, Two States, One Basin" included sessions on Suwannee River basin planning, wildlife, hydrology, estuarine ecology, partnerships, fisheries and contaminants, water quality, ecology, land acquisition and management, invertebrate, minimum flow and levels, nature based recreation, geology, research needs, and water use. The conference served to bring folks from Georgia and Florida together to discuss the issues facing the Suwannee River and to further the cooperative approach to working in the Suwannee River basin.

AMBIENT MONITORING UNIT

The Ambient Monitoring Unit is continuing bio-assessments of potential TMDL streams and assisting TMDL modelers to incorporate habitat and biological data and other observations into their models. We are preparing to go out in the field with the modelers to provide them with a working knowledge of these data.

Sampling has been ongoing since the first of the year, focusing on the Coosa, Tallapoosa, and Tennessee River Basins and monitoring sites are being selected for the field-sampling year. Special impact studies are also being conducted.

The Georgia EPD's 303(d) list for "2000" was approved by the U.S. EPA on August 28, 2000. The U.S. EPA has subsequently required the Georgia EPD to reopen the "2000" 303(d) to update three major river basins (Altamaha, Ocmulgee and Oconee) utilizing data that was not available for use at the time of the generation of the original listing. The amended "2000" 303(d) list is about to be finalized.

The State's 1998-99 305(b) report went to the printer in January 2001 and is available for distribution. Since the Georgia EPD integrates it's 305(b) and 303(d) lists, the 305(b) report could not be completed until the U.S. EPA provided approval of the 2000 303(d) list.

Last report we had associates moving in. This report, I must report that we have associates moving out. We've lost Becky Blasius to greener pastures (or is that drier sands?). Becky has taken a job in Las Vegas, working with the State of Nevada. We wish her all the best. Rumor has it that her new office overlooks Lake Meade, which many consider a positive change of scenery from her previous office under the Atlanta Airport.

INTENSIVE SURVEYS UNIT

The ISU has landed another associate, Jeremy Smith. Jeremy transferred in from another branch of EPD, and brings our crew to capacity. We would like to take this opportunity to

welcome him aboard. He will be working with other associates on lake and tributary work, as well as assisting in areas of the fish tissue report, where he has some background experience. Lake Standards sampling has occurred for the last two months. Lake Allatoona, Walter F George, Jackson, Lanier and West Point are monitored once a month April through October over a wide range of parameters. It is expected that Carters Lake will be added to this list for 2002.

Basin Major Lakes Sampling will occur in the Coosa-Tallapoosa-Tennessee Basin Group for 2001. This basin group includes Carters Lake, Nottely, Blue Ridge, Chatuge and Allatoona (Allatoona being one of the Standards Lakes and sampled under a different project). Basin lakes are sampled once a quarter, for the same parameters as the Standard Lakes.

Reports for year 2000 are finalized for the five Standard Lakes: Allatoona, Jackson, Lanier, Walter F George and West Point. They are available for distribution. The 2000 Basin Lake report is also near completion. 2001 sampling on these two projects is under way.

The ISU (and AMU) assisted other Water Protection Branch staff on a project to document GPS coordinates for the more than 1800 permitted water withdraw sites in the Flint River Basin. The Flint River Basin has been one of the hardest hit areas of Georgia by drought over the previous three summers. As part of a developing drought emergency plan, the State will work with agricultural surface water users to have them voluntarily cut back on the area or amount of water that is withdrawn from the Flint River Basin. Appointments were made with the permit holders to access their sites for coordinate and area size documentation. The State finalized a working drought relief plan and held its first lottery for land use withdrawal from watering the second week of March. A drought emergency was declared by the State March 1 for the coming year.

May 31, 2001

KENTUCKY

Ecological Support Section

New Employees in the Ecological Support Section

After the departure of Lythia to bigger (but not greener) pastures in TEXAS, and Denise's move to Old Virginia, we, luckily, were able to get excellent replacements. We would like to welcome the following new employees:

Eric Eisiminger is our new Watershed Monitoring Program Fish Biologist. Eric has a BS in Biology from Carson-Newman College and has worked in Field Operations Branch for several years. He is an avid fisherman and outdoorsman. He is rapidly learning the fish fauna of Kentucky and the IBI.

Susan Makosky, phycologist, comes to us fresh out of Graduate School at Bowling Green University, working under Dr. Rex Lowe and Dr. Jan Stevenson. Susan worked in as a lab tech in hospital laboratories for 15 years before finding her true love was diatoms. She brings great enthusiasm and taxonomic skills to the Watershed Monitoring Program.

Jessica Schuster is our new interim biologist, working mainly with the Reference Reach Program. Jessica has just finished up her Master's Degree in Ecology at Eastern Kentucky University and is trying to decide between going for a Ph.D. and getting a real job.

Wild Rivers Program

The Division of Water became a landowner in a big way in early 2001. After years of negotiations, the Wild Rivers Program successfully acquired a 1503-acre tract on Martins Fork Wild River, in Harlan County. This property includes riparian land fronting nearly two miles of the 3.9 mile designated river. As a result of this and two other smaller acquisitions, as well as another in progress, the Division now owns much of the wild river portion of the watershed of this high elevation mountain stream. Its headwaters are within Cumberland Gap National Historical Park.

Funding for the 1.2 million dollar acquisition came from the Kentucky Heritage Land Conservation Fund, which provides funding for purchase and management of important natural areas, using proceeds form the sale of nature license plates, the state's portion of the unmined minerals tax and environmental fines collected by the Natural Resources and Environmental Protection Cabinet. For more information, contact Morgan Jones, Wild Rivers Program Coordinator, at (502)564-3410 or e-mail morgan.jones@mail.state.ky.us.

Reference Reach Program

We will be sampling in the Green/Tradewater River basins this year as part of the 2001 basin management cycle. 50 reference sites are scheduled. Last year's Upper/Lower Cumberland-Tennessee-Mississippi sites have been identified except for a few diatom samples (right John?). Actually John Brumley has been ID'ing backlogged samples that Lythia left behind. We tried to sample reference headwater sites in the Bluegrass region this spring but ran into severe drought conditions in April. These streams generally go dry by June, this year…April.

Also, we are looking forward to groundtruthing Level IV ecoregions this summer. Jim Omernik and Alan Woods from EPA in Corvallis have mapped 23 draft subecoregions in KY. We are excited to test out these delineations with our biological, habitat, and chemical data.

Standards and Specifications Section

- Completed Salt/Licking watershed management unit assessments and submitted electronic ADB files to EPA in April
- Finishing up taxonomic work on random survey samples from Cumberland/Tennessee/Mississippi watershed management unit
- Working with regional nutrient team to develop strategy for nutrient or response variable criteria in next triennial review of water quality standards
- Hired *Randy Payne* (another EKU graduate) from Florida DEP to replace Mark Vogel as random survey macroinvertebrate biologist; Mark became supervisor of Bioassay Section
- Completed planning for sites in Green/Tradewater watershed management unit and began sampling in April
- Working on new SOPs and strategy documents that are badly out of date
- Attended Consolidated Assessment and Listing Methodology (CALM) meeting in Annapolis on further development of 305(b) guidance and 303(d) listing methodology
- Completed reach indexing for Salt/Licking unit using new NHD tool
- Placed 2000 305(b) report on web site, including individual stream assessment data and GIS product

Nonpoint Source Section

We have completed our spring sampling of Bluegrass streams which will be used to help our Ecological Support "fish guy" to calibrate the IBI for this physiographic region. Our summer field season will soon be upon us at which time we will begin sampling the Green and Tradewater Rivers. The Nonpoint Source section is also proud to announce that we will have a HUGE display at this years Kentucky State Fair. The footprint alone will be 22,000 square feet, with a 250 ft working replicate stream running through it. This is an attempt to demonstrate to the general public how a watershed works. The model begins with headwaters and moves up in size to a replicate large river system that will even have a working lock and dam. Nonpoint Source pollutants will be represented throughout this model watershed along with tips on how these impacts could be avoided. There will also be several models in this area including a working wetland and a groundwater model. All of these models will be used again throughout Kentucky for education purposes.

Bioassay Section

The Bioassay Section in plugging along. We have been experiencing technical difficulties with our mobile laboratory so we are testing more out of Frankfort than expected. If they can figure out what is wrong and we are allowed to pay for it, we should be back on the road soon.

Still waiting for our fattened up fatheads so we don't have to buy test organisms. They are expected soon. The new boss, Mark Vogel, is catching on quickly. Our SOP update is in final review.

Sediment wise we are finishing up the Upper Cumberland report. We are trying to establish a triad approach to characterizing the extent of contamination in sediment. We did this using sediment toxicity testing, chemical analysis of the same sediment, and macroinvertebrate collections. The report should be done by this fall. We continue to collect TSS samples with integrated stage samplers on Benson Creek.

MISSISSIPPI HAPPENINGS

Summer has arrived here in Mississippi. Seems like the seasons forgot to include spring this year. We're busy as usual with fish kills, and a couple of oil spills have also contributed mightily to keeping things lively.

A New Face.

We wish to introduce and welcome our newest member of the SWPBA "Family" from Mississippi. Katherine Williams has joined the staff of the Biology Section, and is based in our Oxford Office. She has a biology degree from Arkansas Tech. University, with a strong emphasis in aquatics courses.

Mississippi Level IV Ecoregion Project.

We were again pleased to welcome Jim Omernik, Shannon Chapman and Glenn Griffith back to Mississippi to review progress on the revision of Mississippi subecoregions. Jim and company presented a draft Level IV ecoregion map to the workgroup, which included members of the Mississippi Office of Pollution Control, the Mississippi Office of Geology, the NRCS, the USGS, the US Forest Service, Mississippi State University, US EPA Region IV, Mississippi Automated Resource Information System (MARIS), and the Arkansas Soil and Water Conservation Comission . The draft subecoregion map provided a framework for some very lively discussions. Jim, Shannon, and Glenn took the comments of the group back to Corvallis to finalize the ecoregion map for the state. It appears that Mississippi will have 4 Level III Ecoregions (65, 73, 74 and 75) and possibly 17 Level IV subecoregions. We will get back together in October for the ground-truthing phase of this study.

Thanks mainly to Dr. Barb Kleiss (formerly USGS and currently US Army Corps of Engineers- - Waterways Experiment Station) and Phil Crocker (US EPA Region VI), an offshoot of this project was the subregionalization of the entire portion of the Mississippi Alluvial Plain Ecoregion (#73). This Ecoregion encompasses parts of Illinois, Missouri, Kentucky, Tennessee, Mississippi , Arkansas and Louisiana. The USGS NAWQA Program has been studying this area for some time, and their comments were most helpful in understanding the variability of this ecoregion. There is also much interest on the part of the Region VI states in this project, and many have expressed a willingness to lend assistance.

Leaf River Oil Spill near Collins.

Work continues on the Natural Resource Damage Assessment and Restoration on this stream and associated wetland and tributaries that were impacted by the spill. Restoration planning is well underway, but not finalized. Hopefully after the biological studies and restoration planning are reviewed by all involved, we can share this information.

Gas Well Fire in Wayne County, Mississippi.

In March of this year, the MDEQ Emergency Services Section responded to a gas well fire in south Mississippi. The Biology Staff was called to assist with water sampling of adjacent water bodies, due to concerns of fallout of material from the smoke plume. Several days after the fire began, a fish kill was reported in a lake which is part of the Maynor Creek Water Park. Once

again our biologists responded and launched a fish kill investigation. Bluegill sunfish were the only species affected. All measured physical and chemical parameters appeared normal. Water samples that were collected turned up nothing. Necropsies of the fish found that the cause of the kill was ingestion of Fire Ants by the fishes.

Oil Spill in Boggy Hollow, near Purvis, Mississippi.

On March 23, 2001, biologists were requested to provide assistance to the MDEQ Emergency Services Section in conjunction with this oil release which resulted from a ruptured pipeline. Lost oil seeped upward from the pipe and impacted several springs, then flowed through a highly braided channel, then into a small tributary of Boggy Hollow Creek. None of the lost material was noted to have made it into Boggy Hollow Creek, a testament to the rapid response and containment efforts of the company. A total of 5/8 mile of stream was oiled. Physical and chemical analyses of the water and sediments have verified that levels of contaminants have now been reduced to background levels. No oiled birds or mammals were noted, and only one dead frog was recovered and attributed to the oil spill. As part of the Natural Resources Damage Assessment, a benthic study of this area is scheduled to be conducted later in June, as well as a survey of the amphibians.

Ambient Water Quality Monitoring

MDEQ is considering revising the surface water monitoring program (SWMP) strategy. Major revisions likely to occur will involve aspects of the ambient water quality monitoring program, including both the fixed station network and the rotating basin network. We will update SWPBA as this process occurs.

We are beginning the planning phase for data collection in next year's basin (Pascagoula River), as part of our rotating basin network. Data collection will occur in the Index Period (Dec. – March). We are also considering the incorporation of a probabilistic design to our basin monitoring strategy and if so, will target to implement this strategy in the Pascagoula River Basin.

303(d)/IBI Project

The statewide 303d/IBI biological monitoring project mentioned in the last newsletter is ongoing. The field phase of this project resulted in sampling of approximately 475 streams, statewide with the exception of streams in the Mississippi Alluvial Plains Ecoregion. Six teams consisting of MDEQ personnel and private contractors collected biological (benthic communities) physical (habitat assessment, Wohlman pebble count, flow) and chemical (in-situ measurements, nutrients, solids) data from all stations. Field data collection began in January 2001 and ended in early March 2001. Laboratory sub-sampling has geen completed, and taxonomy is ongoing. Data entry and analysis has begun, and the project is on schedule to be completed by January 2002.

Data from this project are already being used to strengthen other agency programs, such as the standards and criteria program (i.e. nutrient criteria development, revision of the pH standards)

and the TMDL program. Most importantly, this project will result in defining of reference conditions classified according to appropriate statewide strata.

305(b) Report

For the 2000 305(b) Report, assessment of the Pascagoula River Basin is presented. This report can be accessed through our web site www.deq.state.ms.us. The remaining four basin groups will be re-evaluated and assessed annually, following the basin rotation, beginning in 2002. The 2001 305(b) electronic submittal has been made to EPA Region 4. This covers the Coastal streams basin and will incorporated in the 2002 hard copy report.

EMAP Coastal 2000

This summer (June –August, 2001), MDEQ and the University of Southern Mississippi Institute of Marine Science's Gulf Coast Research Laboratory will initiate the second year of an anticipated five year coastal assessment study. During the first year of the study, 35 probabilistically - selected sites were sampled as part of the U.S. EPA's Environmental Monitoring and Assessment Program (EMAP) National Coastal Assessment, Coastal 2000. This year, MDEQ is increasing the number of stations to be sampled to 50. MDEQ also plans to fill a vacant position for the purpose of assisting this coastal monitoring effort.

Coastal Beach Monitoring Program

Beach water quality conditions are now made available to the public via the MDEQ Web site: www.deq.state.ms.us

303(d) Intensive Surveys

Several intensive surveys have been initiated to collect and assess data for 303(d) listed waterbodies that have TMDL deadlines of December 1, 2001. These studies involve the collection of biological, physical and chemical data to be used to determine the water quality status of the waterbodies and, if found to be impaired, to determine the cause of impairment. After completion of these studies, TMDLs will be developed for the waterbodies found to be impaired. All data collection is complete and laboratory sub-sampling and taxonomy is underway. These projects are scheduled to be completed by mid to late July 2001.

Mississippi Alluvial Plains Ecoregion (73) Monitoring Strategy

MDEQ is in the process of forming a work group to develop a monitoring strategy for the Mississippi Alluvial Plains Ecoregion (73). This effort was instigated from pressing 303(d) list and TMDL issues facing this region of our state, and from uncertainty regarding an appropriate monitoring strategy for this unique ecological region. The work group will consist of scientists from various state and federal agencies, all who are represented on the Yazoo Basin Team. Specific tasks of this work group will be to propose appropriate ecological indicator/s, develop data collection, analysis and interpretation methods and to develop a study plan for a pilot study to test hypotheses regarding these elements of the monitoring strategy. A contracted facilitator will lead the group.

NORTH CAROLINA

North Carolina remains in a serious money crunch, and the outlook for the future is even worse. The good news is, we haven't lost any people yet, (not to the knife anyway), and we are able to do our field work. Larry Ausley has taken a move to the other side, after over 20 years as a biologist, supervisor, and manager within the water quality section. No, he didn't go to the dark side, he is now a supervisor in the Water Quality Chemistry Laboratory. Steve Tedder is Section Chief of the lab, so they are well heeled with quality management. The fish crews have been at it hard in the field and the bug heads are gearing up. We have several special studies ongoing for model support and TMDL development, and are about to crank up annual lakes work. We will be looking for a supervisor for the Intensive Survey Unit, as Jay Sauber is now supervising our Ecosystems Unit, and will be responsible for our ambient network, coalition monitoring, phytoplankton program, and data management. Take care and have a great and safe summer in the field.

BENTHOS

Basin Assessment

We are gearing up for summer sampling in the Yadkin and Lumber River basins, while finishing up the write-ups for last year's basinwide studies. Winter swamp sampling was conducted at 11 sites in the Lumber basin.

Trish and Dave participated in the Ecoregion verification trip for North Carolina, and a new round of criteria revision will be started when this project is completed. The coastal plain ecoregions (at Level IV or Level V) are becoming increasingly complex. Larry Eaton and Kathy Herring have initiated a project to revise our small stream criteria in the piedmont and mountain regions.

Miscellaneous

Watershed Assessment and Restoration Project. The WARP biologists keep busy with an occasional assist from the rest of our group. A similar project is being coordinated by Chris Roessler through the 1043B program. Over 30 sites were sampled to better evaluate water quality and habitat problems in selected catchments.

The benthos SOP manual was revised in April 2001, and is now posted on the BAU web page (see address under FISH). Unfortunately, the NC budget crisis and the loss of Ken Eagleson to the private sector precluded a much needed update of the tolerance values in the manual. We are still hoping to get this done when money becomes available.

FISH

Revised North Carolina Index of Biotic Integrity

After several years, the NCIBI has recently been revised. The bioclassifications and criteria have all been recalibrated using regional reference site data. Currently, the focus of using and applying the NCIBI has been restricted to wadeable streams that can be sampled by a crew of four persons. Infrequently, larger wadeable streams can be sampled if there is a crew of six persons.

Criteria and ratings are applicable only to wadeable streams in the these river basins: Broad, Catawba, Savannah, Yadkin, Cape Fear, Neuse, Roanoke, Tar, French Broad, Hiwassee, Little Tennessee, New, and Watauga. In the Cape Fear, Neuse, Roanoke, and Tar River basins, the criteria and ratings are only applicable to streams in the piedmont portion of these basins. Criteria and ratings have not been developed for:

- *streams in the Broad, Catawba, Yadkin, Savannah, French Broad, Hiwassee, Little Tennessee, New, and Watauga River basins which are characterized as wadeable first - third order streams with small watersheds, naturally low fish species diversity, cold water temperatures, and high gradient plunge-pool flows. Such streams are typically thought of as "Southern Appalachian Trout Streams";*
  - wadeable streams in the Sandhills ecoregion of the Cape Fear, Lumber, and Yadkin River basins
  - wadeable streams and swamps in the coastal plain region of the Cape Fear, Chowan, Lumber, Neuse, Pasquotank, Roanoke, Tar, and White Oak River basins; and
  - all non-wadeable and large streams and rivers throughout the state.

Further information, including the revised Standard Operating Procedure, may be found electronically at:
http://www.esb.enr.state.nc.us/BAU.html. If you have any questions, please contact Bryn Tracy at 919-733-6946 or electronically (bryn.tracy@ncmail.net).

Fish Community Basinwide Monitoring

Year 2001 basinwide monitoring focuses once again on the Yadkin and Lumber River basins. These basins were last monitored in 1996. This year, six weeks will be spent monitoring wadeable streams in these basins. Low water and favorable weather have made sampling conditions ideal. As of May 4, 2001, 43 streams in the Yadkin River basin have been sampled. New intrabasin distributional records for several species have already been documented.

Fish Tissue Monitoring

Waccamaw/Reigelwood Study

The Lumber River basin covers a broad swath of southeastern North Carolina and includes several major waterbodies, including the Lumber and Waccamaw Rivers and Lake Waccamaw. At present, eleven waterbodies in the basin are covered under section 303(d) of the Clean Water Act due to elevated mercury levels in several fish species. This area is characterized by some of the highest fish mercury levels in the state, thus it can be considered high priority in terms of potential human exposures. As part of the section 303(d) requirements, the North Carolina DENR Division of Water Quality (DWQ) has completed a draft Total Maximum Daily Load document that attempts to identify inputs of mercury to these waters. One of the conclusions made in that document is that wet deposition of regional atmospheric releases of mercury, principally emanating from a single chlor-alkali plant estimated to release over 1,400 pounds per year of mercury to the air, are responsible for the majority of mercury inputted to these sensitive waters.

In April of 1999, the chlor-alkali plant began converting to a membrane process for chlorine bleach production that does not involve mercury. This should result in a substantial reduction of local mercury inputs to both air and waterways. At present, the DAQ is cooperating with EPA Region IV to assess the air quality impact of the conversion process. In the Spring of 2001 ESB began monitoring mercury levels in fish tissues at six stations around Riegelwood in the area to

continue to assess long-term trends following regional source reduction. ESB anticipates returning to the sites for the next several years.

EPA's National Fish Tissue Study

Fish tissue sampling for EPA's National Fish Tissue Study will continue in 2001. ESB is scheduled to collect fish from 3 NC lakes in late summer as part of an ongoing national assessment of fish contaminants. The 2001 stations include: Mt. Island Reservoir (Mecklenburg Co.), Impoundment on the Oconaluftee River (Swain Co.), and Smith Lake (Cumberland Co.).

North Carolina Action Level Water Quality Standards Brief

In 1984, North Carolina adopted Action Level water quality standards for copper, zinc, iron, and silver. These standards were developed to prevent the State from having to adopt the EPA criteria for metals, which at the time were overly restrictive.

Action Level water quality standards are a special category of surface water quality standards, which are flexible instream criteria established for certain substances that meet the following conditions:

- The chemical must be non-bioaccumulative (BCF<100);
- The chemical must have variable toxicity due to its chemical form, solubility, affinity for other ligands, or other characteristics; and
- The aquatic species used for whole effluent toxicity (WET) testing must be among the most sensitive biota to that particular chemical, based on available toxicity data.

In the early 1980's EPA was just discovering the mechanisms that made these metals toxic. One of the things that was clear was that, in most waters, only a portion of the total metal concentration is bioavailable. At the time, the best method for determining the bioavailable portion of the metal was WET testing. Thus the standard was written to allow a facility to calculate a more site-specific metals limit using a measure of bioavailability and was implemented using WET testing.

Under the Clean Water Act, EPA must approve all state standards and reclassifications. In 1985, 1986 and 1990 when EPA reviewed the action level water quality standards they only conditionally approved them. They had concerns related to the fate and transport of the metals in natural systems. In order to get the conditional approval, which prevented EPA from promulgating standards for North Carolina, the Division committed to conducting fate and transport studies on selected metals, including copper and zinc, contingent on adequate funding. Several study plans were developed and presented to EPA for funding. No funding was made available.

When these standards were adopted, EPA requested information on how the Action Level standards would be implemented. The implementation procedure presented to EPA involved establishing WET testing limits and monitoring for discharges with copper or zinc in their effluent. No permit limits for the metals were to be given if the facility continued to pass their WET limits or if upon failure of the WET testing an action level parameter was <u>not</u> found to be a causative factor.

EPA was uncomfortable with this process and, when other states began asking about using a similar approach, they became even more uncomfortable.

While North Carolina was using its action level standards, EPA was grappling with metals criteria. The original national criteria were so low that some pristine streams had higher background concentrations of copper and/or zinc and would have been considered impaired. In recent years, EPA has developed equations and procedures for determining site-specific metals

criteria and for measuring more precisely the bioavailable metals.

During the last Triennial Review, North Carolina agreed to modify the action level language to reference EPA's guidance on developing site-specific metals criteria and to provide a detailed Implementation Procedure for action level standards. Had North Carolina not taken these actions, EPA was ready to promulgate straight standards for metals for North Carolina based on perceived successes in other states. This action would have resulted in permit limits for copper and zinc in most NPDES permits.

The Implementation Procedure that the Division is beginning to implement was reviewed by EPA and reworked by the Division several times during 1999 and 2000 before EPA finally approved it in October 2000.

Internal Toxicity Testing Activity

For Federal Fiscal Year 2000, the Unit performed 16 acute and 68 chronic effluent toxicity tests, 41 quality assurance tests, 20 contract laboratory related tests, and 29 ambient chronic tests. During the same period, the Unit reviewed 2421 NPDES WET toxicity reports, generated 254 NOVs for WET noncompliance, 48 NOVs for failure to report or report late WET results, reviewed issuance or re-issuance of 152 permits with WET, reviewed and responded to 28 TIE/TRE plans and/or activity reports, reviewed 7 biocide use applications, issued 70 Notices of Deficiency, generated 45 enforcement actions for toxicity limit noncompliance, generated 105 letters to permittees concerning environmental test conditions which were not achieved, and completed 19 biological laboratory inspections, among other activities.

The Unit continues to utilize a Microtox® unit in cooperation with the Ecosystems Unit. The Microtox® unit measures varying bioluminescence from a marine alga to detect effects from toxicants. We are developing procedures to extract and detect the *Pfiesteria* and algal toxins using the Microtox® analysis. The unit will also be used for special studies developed by the Aquatic Toxicology Unit including side-by-side testing of final effluents and other known toxic waters. Plans also include evaluation of the Microtox system for sediment toxicity studies. USEPA freshwater whole-sediment toxicity methods are also being reviewed for possible development of internal testing capabilities.

As part of contingency plans in the event of a foot and mouth disease outbreak the Unit provided input regarding various decontaminant compounds for their impacts on water quality. Compounds selected for equipment decon included citric acid and Virkon S detergent. Toxicity data was evaluated and suitable surface water discharge rates provided, although access to surface water should be limited.

SOUTH CAROLINA

DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

AQUATIC BIOLOGY SECTION

Macroinvertebrate Group

We have finally completed our 2000 identifications and are currently entering the data into our Foxpro for Windows database. After this, data will be analyzed and submitted to the watershed managers to go into the annual report. In February we sampled several swamp streams in the Saluda-Edisto Basin along with some random sites that fell in the Middle Atlantic Coastal Plain. We are now gearing up for our summer sampling season that will cover the rest of the Saluda-Edisto Basin.

Other activities that have kept us busy include guest lectures at festivals, workshops and universities, reviewing consultant reports, and helping out in other program areas when the need arises. Jim Glover is still working on new species descriptions and is presenting a poster in early June at the North American Benthological Society.

NPS Program

Well, the NPS group has once again changed names and faces. We have hired Melissa Tyson in February, formerly of the Water Quality Monitoring Section of DHEC. She has been working diligently to learn taxonomy and sampling technique before our sampling season starts at the end of June. She is ready to go, and brings new energy to our program.

Another big change is Peyton Sasnett has decided to pursue other options, and has taken a position teaching at Heathwood Hall Episcopal School. She will be teaching middle school science, and is scheduled to leave us in July. We are losing six years of experience with Peyton, and she will be missed. So if anyone is looking to relocate to SC, we will be filling that position this summer. Just contact me for more information.

Other than the personnel changes, our workload has remained consistent. As summer approaches, so does the macroinvertebrate sampling season, and all other studies continue on. We are still working on bacteria studies for stations on the 303(d) list. We conduct small-scale bacteria studies on several of the stations for which DHEC is required to do TMDL's. We begin with the trend station, and select 4-6 stations around it in an attempt at pinpointing the source of fecal contamination. This assists the watershed managers in properly writing the TMDL. These studies last approximately six months each, sampling weekly.

I am still working on two δ319 Studies, one in the Wilson Creek and Ninety Six Creek Watersheds (in Greenwood County), and one in the Twelve Mile Creek Watershed in Pickens County. Both projects deal with cattle exclusion and alternate watering sources. The Pickens study will be over this October, but the Greenwood study has several more years. At this time, we are expecting to have another project to monitor, but have not received any information on it yet.

We still work on macroinvertebrate assessments for enforcement sites for the District offices. That work always comes in spurts – I am working on only one now, but I just finished up four that all were requested at the same time.

I finished all the identification for macroinvertebrates collected last year off the 303(d) list. We were trying to get stations on the list for metals off, if the biology came back good. I have not finished working up the data yet, and it may be possible to remove at least one station, but not likely too many others.

I am still working on perfecting my midge identification skills. Harry says I am doing well, and my confidence level has increased. I am finding it challenging and interesting.

If you have any comments or questions, (or would like more information about our available position!) you may contact me at:
Kristine Hoskins (803) 898-4400 or hoskinkc@columb32.dhec.state.sc.us

Fisheries Group

The fisheries group has been busy collecting fish for the fish tissue program, with emphasis this year on the Edisto River basin. We have collected approximately 900 fish from 50 sampling stations. We have also been collectively working with the South Carolina Department of Natural Resources on IBI's this spring. We have been surveying four streams per week, and are working towards completing an SOP for IBI collection. In addition, we are gearing up to collect king mackerel samples for mercury analysis from several fishing tournaments this summer. The 2001 Advisory Booklet was released this summer, which included several minor changes from last years.

TENNESSEE

Departments of
Agriculture (TDA), Environment and Conservation (TDEC), and Health (TDH)

*News from the BEST**

** Biologist and Environmental Specialist Teams*

TDA - The Nonpoint Source Program

Ghost River Land Acquisition Project

Lead Agency: Tennessee Department of Agriculture, Tennessee Nonpoint Source Program
Funding: EPA: $250,000; Matching: $284,755

The Ghost River region of the Wolf River, in Fayette County, Tennessee, is part of the larger Wolf River Conservation Initiative. The Ghost River section is a 10-mile segment of the Wolf River. It features a meandering river channel, a swamp forest where the river channel is braided, and an open swamp lake. The banks and parts of the river are forested. The overall water quality is considered good as the river supports many species of mussels. The significance of the Ghost River region relates to its unaltered channel that supports important forest communities in need of protection. These communities are bald cypress, water tupelo and bottomland hardwood forests.

To accomplish riparian habitat conservation and wetland habitat restoration on the Ghost River, a three-phased project was developed and implemented: **Phase One:** Approximately 1,521.02 acres were purchased. Phase One of this project was directed toward land acquisition/conservation easements for protection from nonpoint source pollution. More than 1500 acres have been purchased in the Ghost River Section of the Wolf River, for long term conservation of the riparian and wetland habitats; **Phase Two:** With cooperating organizations, a plan was developed for thorough restoration of the tracts, including riparian reforestation, wetland restoration, and cattle exclusion, and; **Phase Three:** In association with cooperating organizations, restoration work has been implemented.

The Ghost River Initiative represents one of many conservation projects under way to protect the Wolf River. The restoration of bottomland hardwood forested wetlands is important in Tennessee because of the decline in this category of wetland habitats. Efforts will continue to ensure that this unique river system is preserved in its natural state for future generations to enjoy. For more information, contact Reggie Reeves, TDEC, Division of Natural Heritage, (615) 532-0434.

TDEC - Water Pollution Control

TDEC/WPC released copies of: *The Status of Water Quality in Tennessee: Year 2000 305(b) Report,* on March 12, 2001. The report reveals that water quality continues to be generally good in Tennessee. Over two-thirds of the streams and over three-fourths of the lakes fully support their designated uses.

In the last two years, TDEC has been able to greatly improve assessment methodologies via the Watershed Approach. In the past, TDEC has tried to assess as many streams as possible, often relying on professional judgment or statistical estimations. The state's new watershed approach allows for more precise monitoring and higher confidence in assessment results.

The state has been divided into 54 watersheds. The first group was initiated in 1996. Tennessee's cycle begins with planning and data collection in the first year. Monitoring, assessment, wasteload allocation, and permit issuance occur in the following years. To receive a copy, call 1-888-891-TDEC or write to the following address: Division of Water Pollution Control, 6th Floor, L&C Annex, 401 Church Street, Nashville, TN 37243.

Review of Water Quality Standards

In January of 2001, the Tennessee Water Quality Control Board asked the Division of Water Pollution Control (WPC) to initiate the Triennial review process. WPC is pursuing development of a set of regional numeric interpretations of the existing narrative criteria for nutrients and biological integrity. The basis for these new clean water goals would be data collected at reference streams located in ecoregions across the state. For more information, contact Greg Denton (615) 532-0699.

TDEC to Establish Erosion Control Training Program

One of the major recommendations of the Commissioner's Water Quality Forum was to develop a water quality certification program for Tennessee contractors. TDEC, in cooperation with Chattanooga and Metro Nashville, had already initiated development of an erosion control training program. WPC is planning to launch a pilot program to train developers, contractors, road builders and others involved in land disturbance on the best practices for preventing erosion and water pollution. According to the state's 2000 305(b) report, the Status of Water Quality in Tennessee, siltation is the largest cause of water quality impairment in Tennessee streams. Construction activities are a major source of siltation. Under permits issued by TDEC, construction activities must be performed in a manner that does not cause pollution. However, in some environmental assistance centers (EACs), WPC staff dedicate approximately 30 to 40 percent of their time investigating construction projects that do not comply with permit requirements. In the Knoxville EAC, it is 40 to 60 percent.

TDEC has initiated the Erosion Prevention and Sediment Control Training Program to establish standards of practice and educate people working on construction sites, with the goal of increasing permit compliance and preventing pollution. The course will be offered in two levels. The first introductory course is intended for site workers. The second, more advanced course will be aimed at project planners. These programs are currently in the draft phase. TDEC plans to launch a pilot version of the training program in June 2001.

TDEC convened a collection of contractor associations and water quality education groups to discuss ideas and options for providing erosion control training and voluntary certification to private companies, government agencies or individuals with erosion control responsibilities and interests. Participants include the Tennessee Department of Transportation, the Tennessee Road Builders Association, Associated General Contractors of Tennessee, Consulting Engineers of Tennessee and others. This group is meeting on a bimonthly basis, and will work together to reach out to construction companies and encourage them to have their employees complete the training course, which is being prepared so that organizations can train their own staff and members. The focus of the group is the development of a long-term effort to develop a superior erosion control training program for Tennessee. For more information, contact Robert Karesh (865) 504-5584 and Alan Jones (615) 253-1436.

Progress for the Copper Basin

State and federal officials, U.S. Representative Zach Wamp and the Occidental Petroleum Company (OXY) announced the kickoff of a project to clean up the Copper Basin. The area has

long been a national example of environmental degradation. Reforestation efforts have been underway on the property for several years. The project will cost tens of millions of dollars at the minimum and will be paid for by OXY, its subsidiary Glenn Springs Holdings and EPA. The agreement is the result of an agreement between OXY, EPA and the state of Tennessee and was driven in a large part by Congressman Wamp. The agreement enables swifter cleanup than traditional approaches, which would have resulted in costly and time-consuming litigation. The cleanup will cover thousands of acres of contaminated soils and water, the result of over a century of copper mining and smelting. For more information contact: Jim Haynes (615) 532-6703, Andy Binford (615) 532-0911, Andy Shivas (615) 532-0912 or David Harbin (615) 532-0144. As a side note, based on North Carolina's Ecoregion Delineation Project, the Copper Basin will be split out as a separate Level IV Ecoregion. Tennessee did not delineate this area as a separate ecoregion because in 1995, the variability seen in this area of the Blue Ridge Mountains (Ecoregion 66) was considered to be man induced. North Carolina has least disturbed areas to support delineating the Copper Basin as a separate ecoregion. Way to go NC!

Total Maximum Daily Load Development Update

WPC continues to develop total maximum daily load (TMDL) standards for specific pollutants in Tennessee water bodies. TMDLs have been approved for copper for Cane Creek, for fecal for Sinking Creek and for fecal for Cash Hollow Creek. A TMDL for fecal for Roan Creek is awaiting EPA's final approval, as are five fecal TMDLs for South Fork Forked Deer River. Six draft TMDLs are currently under internal and external review for the Loosahatchie River and Shoal Creek. Eleven TMDLs are currently in progress for the Wolf River, Fort Loudon Lake and Crab Orchard Creek.

On April 10, 2001, the Division of Water Pollution Control submitted an application to EPA, Region IV, for additional funds. A total of $633,488 will be made available to Tennessee for 12 additional positions to the state's TMDL program. Five positions will be dedicated specifically to the Watershed Section for writing and coordinating TMDLs. Two new positions will be added to the Planning and Standards Section to facilitate water quality data collection and storage for TMDL modeling purposes, standards development and permit support. The remaining positions will be added to the environmental assistance centers, in order to enhance the five-year rotating watershed monitoring cycle efforts and TMDL data collection. WPC anticipates hiring these new staff early in state fiscal year 2001-2002. Contact Garland Wiggins (615) 532-0633, or Sherry Wang (615) 532-0656. You can also visit the web: www.state.tn.us/environment/wpc/tmdl.htm

TDH – Aquatic Biology Section

Lab Services, Aquatic Biology Section, lost Debbie Arnwine as Manager. Debbie now works at TDEC/WPC in the central office. She now gets to do something with all the physical, chemical, and biological data that she and all the Aquatic Biology Section has collected over the years, in addition to all the data from WPC EACs (a.k.a. Field Offices). David Stucki has assumed management of the Aquatic Biology section. GO DAVID!

The Aquatic Biology Section is currently collecting chemical and benthic samples in the Obion River watershed in West Tennessee. We will also be collecting some samples in middle Tennessee, specifically in the Level IV Ecoregion, 71i – Inner Nashville Basin. We have also completed 24 chronic toxicity tests and 8 acute definitive tests. There are 6 more chronics to go for the year. (Live C.d. Live!)

Biologist Rob Lindbom and his wife Jessica are the proud (and sleepy) parents of William Calvin Lindbom, born April 6, 2001. Will weighed 8lb. 10 oz. and was 22 1/4 in. at birth. Rob intends

to take full advantage of parental leave. Rob and Jessica were 2 of the school of fish from DOEO that swam around at the 1995 SWPBA meeting hosted in Chattanooga, Tennessee.

From: Joy Broach, TDEC, Water Pollution Control

To: SWPBA Brothers and Sisters,

As some of my friends have put it, I have gone to the "dark side." I have accepted a Biologist position with the Corps of Engineers – Nashville District. But what most people don't know, is that my career as a biologist was born on the "dark side." In 1982-83, I was a coop with the Corps. In fact, the Division I have joined has 3 of the original people that I worked with back then. So, in a sense, I'm going back, but much better prepared and experienced... thanks to all of you.

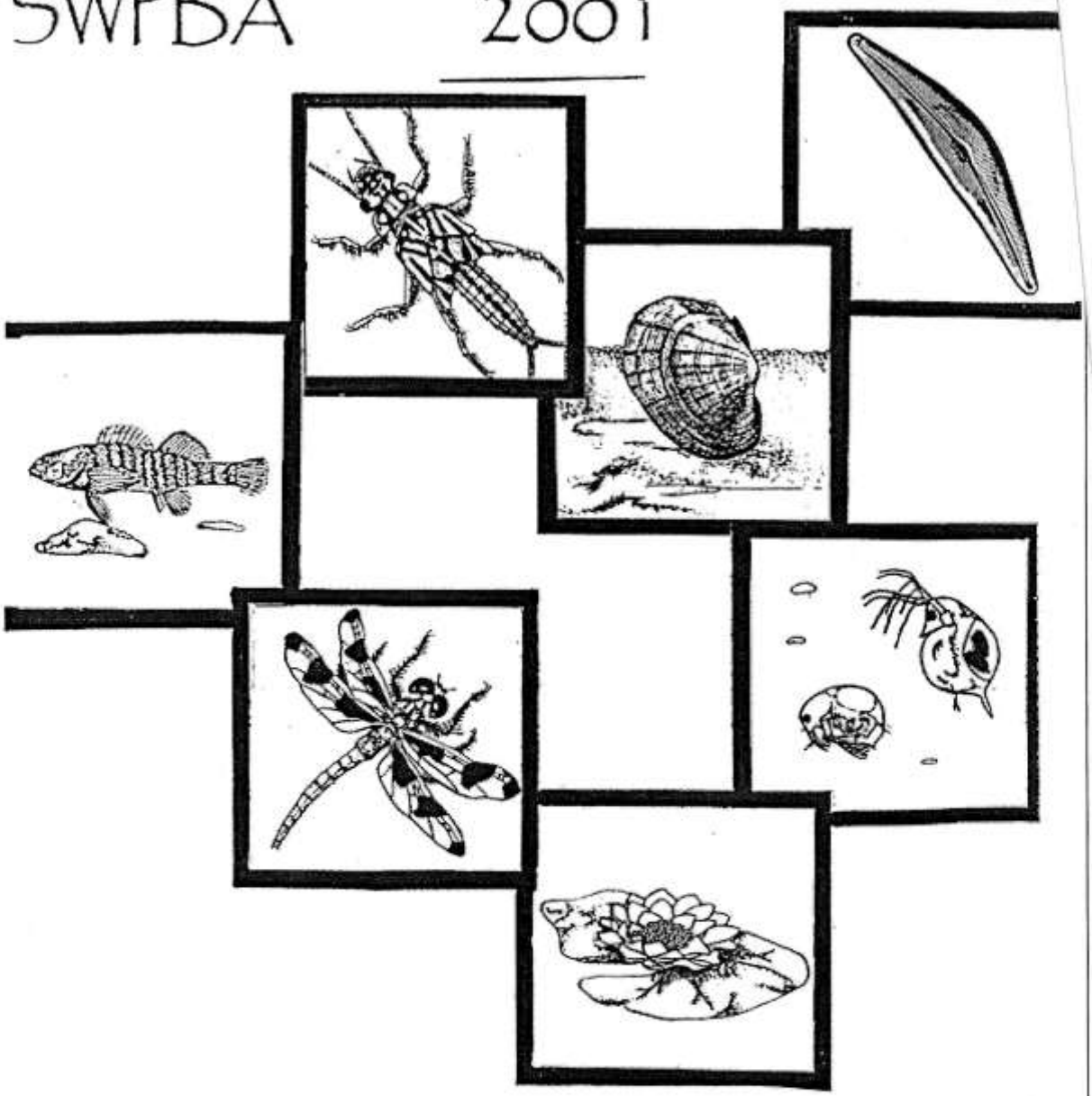
I did not stay with the Corps back then because I wanted to be a "real" biologist – where fieldwork was the job. For 7 years, as a state biologist, in TDH Aquatic Biology Section, I did just that. But with a growing family, my job situation changed, and I moved to the Central Office and became in essence, a desk biologist. And as you all know too well, it is difficult to plan field monitoring if you haven't been out in the field, and understand where Murphy's Law kicks in.

The Corps job, in the Planning, Programs and Project Management Division, Nashville District, requires some fieldwork. All projects (BA, EA, EIS, NEPA, and Endangered Species) require a site evaluation. It's not 40%, but hey, 10% beats nothing. But what is intriguing, is I will probably interact with some of you state biologists because the District and TVA's boundaries cover parts of the southeastern states. (The Corps and TVA sometimes work together.) Perhaps one of the most valuable lessons I've learned from SWPBA is to think out of the box – think out of the state. The Ecoregion Delineation Project is a primary example. Each state built its delineation project on the foundations of member states, and through this collaborative effort, you all will soon see a Level IV Ecoregion Map of the Southeast. No small task. No doubt the training I have gotten in SWPBA – playing well with others – will be a major skill I take to the Corps. Until we meet again ... Thank you, to all of you – SWPBA ... the roots run deep.
Joy Broach (Joy.I.Broach@LRN02.USACE.ARMY.MIL)

That's All Folks!

5/29/01

SWPBA 2001



Bowling Green, Kentucky

Subject: DWQ vs EPA Tox Methods
Date: Tue, 10 Jul 2001 14:05:01 -0400
From: "Matt Matthews" <matt.matthews@ncmail.net>
To: "Coleen Sullins" <Coleen.Sullins@ncmail.net>
CC: "Jimmie Overton" <Jimmie.Overton@ncmail.net>,
"Dave Goodrich" <Dave.Goodrich@ncmail.net>

Coleen,

Here's a timeline of events around this issue:

May 2000-EPA lab audit raises issue of differences between DWQ chronic Ceriodaphnia protocol.
Primary points of interest are:
- Use of three samples (EPA) vs two samples (DWQ)
- Daily solution renewals (EPA) vs solution renewal on days 3 and 5 (DWQ)

June 2000-Made initial contact with Wayne Turnbull of Region 4 to request guidelines for alternate method approval

August-September 2000-DWQ conducts preliminary study comparing protocols in side-by-side fashion (see attachment "PrelimStudyResults")

October-December 2000-Phone contacts made to Wayne Turnbull and Ron Weldon requesting formal guidelines for obtaining approval for NC DWQ's method as an "Alternate Method" under 40 CFR.

June 2001-Formal written request to EPA requesting formal guidelines for obtaining approval for NC DWQ's method as an "Alternate Method" under 40 CFR.

I will be available Tuesday if needed.

Matt Matthews
NC DENR/Division of Water Quality
Aquatic Toxicology Unit
1621 Mail Service Center
Raleigh, North Carolina 27699-1621
v-(919) 733-2136
f-(919) 733-9959
MailTo:Matt.Matthews@ncmail.net

Turnbull-Weldon-StudyPlan.doc	**Name:** Turnbull-Weldon-StudyPlan.doc **Type:** Microsoft Word Document (application/msword) **Encoding:** base64 **Download Status:** Not downloaded with message

PrelimStudyResults_0800.doc	**Name:** PrelimStudyResults_0800.doc **Type:** Microsoft Word Document (application/msword) **Encoding:** base64 **Download Status:** Not downloaded with message

Subject: Water Quality and the NC Swine Industry
Date: Tue, 10 Jul 2001 14:19:18 -0400
From: Jay Sauber <jay.sauber@ncmail.net>
To: Jimmie Overton <Jimmie.Overton@ncmail.net>

http://www.ces.ncsu.edu/whpaper/WQswine.html

--
Mail:
Jay H. Sauber
NC Division of Water Quality
1621 Mail Service Center
Raleigh NC 27699-1621

Location:
4401 Reedy Creek Road
Raleigh, N.C. 27607
Phone: 919/733-6510
Fax: 919/733-9959

Water Quality

and the North Carolina Swine Industry

March 10, 1995

Introduction

It is difficult to imagine any resource of more value to society than clean water. Reliable sources of clean drinking water are vital to the existence of any population. Yet particularly in a state like North Carolina, it is arguable that clean water provides more than physical nourishment, that clean water contributes to the character, to the nourishment of the collective soul of the state. What would North Carolina be, after all, without the cold, clean creeks and streams that tumble out of its mountains, without the rivers that snake across the Coastal Plain, without the mirror-smooth swamps that reflect ancient cypress trees, without sounds and estuaries or the surf that relentlessly pounds the state's coast?

Keeping the state's waters clean and providing for the well being of its human population--especially as that population grows--can be conflicting goals. Many of the activities we consider progressive--activities that provide jobs, for example--pose potential hazards to water quality. Indeed, even that most basic of activities, growing food, entails potential threats to water quality.

The following pages deal with water quality and a particular type of agriculture--hog farming. What follows is not a scientific report in the sense that it contains technical language and citations. Citations and technical language were intentionally omitted in an effort to promote better understanding of complex issues. But this report is scientific in that it is based on the carefully documented studies of experts on water quality and agriculture.

North Carolina farmers who grow hogs typically collect manure in lagoons outside the barns in which hogs are raised. In the lagoons, manure is degraded by anaerobic bacteria; carbon-containing compounds decompose and become carbon dioxide and methane; organic nitrogen is converted to ammonia and ammonium.

Farmers usually use lagoon liquid as fertilizer, applying it to fields. Using the liquid in this way takes advantage of the nutrients in the manure. The liquid from lagoons is a nutrient resource, and proper management and use of this resource can reduce the need for commercial fertilizers.

Nitrogen and Water Quality

Ground water quality can be affected when soil below the root zone contains unusually high levels of nitrate nitrogen and other nutrients. In some circumstances, nitrate nitrogen can move through the soil and into ground water. If nutrients in ground water reach a well that supplies drinking water, they can pose a human health hazard. Nitrate nitrogen may also be carried by ground water to streams and lakes, where it can be an environmental threat.

Consuming nitrate nitrogen can alter the body's ability to transport oxygen, causing a condition called methemoglobinemia, also known as Blue Baby Syndrome. This syndrome can be fatal to infants.

While there has never been a documented case of Blue Baby Syndrome in North Carolina, some wells do exceed the drinking water limit of 10 parts per million of nitrate nitrogen.

The North Carolina Cooperative Extension Service has tested over 10,000 wells throughout the state. In some Coastal Plain counties, as many as 10 percent of the wells tested exceeded the 10 parts per million standard. It is not clear that hog farms contributed to this contamination. Indeed, when an effort was made in Sampson County, which has the largest swine population in the state, to determine the cause of well contamination, sources other than hog farming appeared to be at fault.

Perhaps a greater potential threat to North Carolina water quality is surface water contamination. Propelled by ground water, nitrate nitrogen can move through the soil and into surface waters such as streams, rivers, lakes and ponds. Nitrate nitrogen can also be carried to surface waters in surface runoff, the water that flows across the soil surface rather than seeping into the ground.

Phosphorus, which is much less soluble than nitrate nitrogen, does not move with ground water into surface waters. It can, however, be transported to surface waters by runoff, as can other sediments. Sedimentation, the contamination of surface waters by sediment carried by runoff, is widely regarded as the most serious threat to surface water quality in North Carolina.

High levels of nitrogen and other nutrients in slow-moving or stagnant surface waters can cause a phenomenon called eutrophication. The nutrients fuel the growth of algae, which consume oxygen in the water. As the algae die and decompose, even more oxygen is consumed. Without oxygen, fish and other marine animals die.

How Hog Farming

can affect water quality

Cattle and Hogs

There is concern among scientists familiar with the North Carolina swine industry about the practice being adopted by many hog growers of raising beef cattle along with their hogs. Cattle are seen by many hog growers as an economical addition to their operations. Lagoon liquid is applied to fields, where it serves as fertilizer for pasture. Cattle are then grazed in the fields.

Scientists are concerned that with the lagoon liquid application rates now typically used by growers, grazing cattle does not remove an optimum amount of nitrogen from the land. While the forage being grown in the fields does take up and use nitrogen from the lagoon liquid, cattle then eat the forage and redeposit some of the nitrogen in the fields in the form of urine and feces.

While raising cattle and hogs may be problematic, it also appears it is possible to accommodate both types of livestock without threatening water quality. Agricultural scientists are looking at strategies to remove nitrogen from the land while leaving cattle on it. For example, making at least one hay crop from the pastures on which cattle are now grazed would remove a significant amount of nitrogen. And adjusting lagoon liquid application rates to account for the presence of cattle is an effective method of ensuring that adequate amounts of nitrogen are removed from the system.

Dealing With Dead Animals

Dead animals also pose a potential threat to water quality. Some North Carolina hog growers dispose of dead animals by burying them, and it is possible that decaying carcasses could contaminate ground water.

However, most of the larger hog growing farms in the state rely on rendering services, which make animal food from carcasses, to dispose of dead animals. It is thought that more dead animals are disposed of by rendering than in any other way. Composting carcasses also appears to offer a disposal alternative. North Carolina State University scientists and engineers are experimenting with this environmentally friendly management method.

The Sampson County Story

It may be instructive in considering the effect of the North Carolina swine industry on water quality to look at Sampson County. Sampson and next-door-neighbor Duplin County are the two largest hog-producing counties in the United States.

The North Carolina Cooperative Extension Service in 1991 tested the water from 317 private water supply wells in Sampson County. Fourteen of the wells had nitrate nitrogen concentrations higher than the 10 parts per million standard. Further investigation of these 14 wells revealed that in no case could the contamination be traced to a lagoon or animal feeding and housing facility. All of the contaminated wells were shallow, and most of the contamination was due to faulty well construction. In some cases, the wells were near septic lines, and the septic systems were thought responsible for the high nitrogen levels.

It is perhaps of note that portions of the Black and South rivers that flow through Sampson County were classified in 1994 as Outstanding Resource Waters by the North Carolina Division of Environmental Management. Only waters that have been tested for biological and chemical contamination and have been shown to be of excellent quality may be designated Outstanding Resource Waters.

The designation helps maintain water quality. New or expanded wastewater discharges from industry are not allowed in Outstanding Resource Waters, while new urban development activities within the watershed of Outstanding Resource Waters must limit density or use storm water control systems to manage storm water

where it is applied, and rates and timing of application. Growers must also provide a vegetative buffer at least 25 feet wide between streams and fields to which manure is applied.

These manure management requirements are an important component of efforts to protect water quality.

The Need for Research

It seems clear there is much to be learned about the effect of large hog farms on water quality. It is vital that research continue in this area. An annual research update would serve to keep growers and policy makers informed of the latest research.

Can We Have Hogs

and water quality?

Clearly, raising swine can pose potential threats to water quality. However, it is the prevailing opinion of agricultural scientists familiar with the large hog farms typical of North Carolina that it is possible for this important industry to exist while also protecting water quality.

It should be understood, however, that there are limits to the number of animals that can be produced within a given watershed without unduly threatening water quality. Only through solid research can we determine what these limits are and how they may be affected by improved agricultural management practices.

It is important also to understand that technology and knowledge alone are not enough to protect water quality. Hog growers arguably play the most important role in protecting water quality. The actions of growers--how well they manage their farms--ultimately determine whether water quality is endangered. We must, therefore, make every effort to make sure growers are aware of and encouraged to adopt improved manure management methods as they become available.

Recent and Current Research Projects

related to water quality and the swine industry

(Title, Investigators)

Selection of Plants for Constructed Wetlands for Wastewater Treatment, J. M. Stucky

Management of Animal Waste in Support of Sustainable Agriculture and Water Quality , P. W. Westerman

Genesis and Hydrologic Characteristics of Soils on the Piedmont Coastal Plain Fall Line (subsurface movement of waste), H. J. Kleiss

Groundwater Contamination Potentials of Agricultural Practices, R. L. Huffman

Environmentally Compatible Nursery Crop Production Practices (wastewater runoff and water quality), T.

Federal Framework

Federal regulations under the Water Pollution Control Act prohibit discharge of wastes to waters of the U.S. without a permit. These regulations designate "concentrated" animal feeding operations as point sources of wastewater discharge subject to the National Pollutant Discharge Elimination System (NPDES) permitting program. A "concentrated" operation is defined as one with at least 1,000 animal units (about 2,500 swine larger than 55 pounds each) maintained for 45 days or more in a nonvegetated area. Regulations specifically state that discharge from animal feeding operations of any size to waters of the U.S. is prohibited except in the case of the 25-year, 24-hour storm, and that if there is a continuous discharge from an animal feeding operation, the operation shall be required to obtain an individual NPDES discharge permit. However, there are no provisions for NPDES discharge permits for animal feeding operations, so, in effect, no discharge from animal feeding operations is allowed. All state regulations of animal feeding operations are built on these minimum federal requirements.

Until recently most states dealt with discharges from animal feeding operations on a case-by-case basis. If investigation following a fish kill or citizen complaint documented a discharge from a feeding operation, that operation would be "designated" as a "concentrated" animal feeding operation subject to NPDES permitting requirements and would be required to implement (or upgrade) some form of waste management system (typically a lagoon) that would prevent all discharges except in the case of the 25-year, 24-hour storm. This kind of after-the-fact regulatory scheme, dependent as it was on citizen complaints, was not useful for preventing discharges, and in fact, amounted most of the time to no regulation. Indeed, regulatory agencies did not even have records of the numbers, sizes or locations of animal feeding operations.

As animal operations, particularly swine operations, grew in size and in number across the Southeast, the threat to water quality, drinking water sources and human health from these operations increased. Therefore, in the last few years, many states have adopted supplemental regulations through which they may more directly and systematically address the potential for water pollution from animal operations. This analysis compares animal waste management regulations in four Southeastern states experiencing substantial growth in large-scale animal operations: Georgia, Virginia, South Carolina, and North Carolina.

Similarities in State Programs

The general features of all the state animal waste management regulations examined are similar. First, they are all implemented cooperatively by a state regulatory agency in cooperation with an agency that provides technical assistance--either the federal Soil Conservation Service (now Natural Resources Conservation Service) and/or state soil and water conservation agencies and/or the Cooperative Extension Service (see following table). The degree to which states rely on the Soil Conervation Service and the Cooperative Extension Service for technical assistance and the degree to which they involve soil and water conservation districts in program implementation varies.

Another common feature of state programs is that they all set a size threshold below which operations are regulated much less stringently, although the size threshold varies considerably (see following table). In North Carolina, Virginia and Georgia, operations under the threshold size are still dealt with on a case-by-case basis. These smaller operations are required to have facilities that prevent discharge except in the case of the 25-year, 24-hour storm and are encouraged to use best management practices in the disposal of animal waste. However, they are not required to register and unless there is a reported discharge, they are, for all practical purposes, unregulated. In South Carolina, smaller operations are required to have the same permits as the larger operations, but the permit requirements are different.

The basic requirements of the four state programs are also similar. Each includes some mechanism

North Carolina, Georgia, and South Carolina require that waste management systems be designed in accordance with the SCS Field Office Technical Guide. SCS Standard 312 defines and describes the purpose and components of a Waste Management System and principles of agricultural waste management. SCS Standard 359 contains minimum acceptable requirements for design, construction and operation of waste treatment lagoons. Some requirements are: locate lagoons a minimum distance of 300 ft from dwellings (750 ft for new operations); do not locate in floodplain unless protected from inundation by the 25-year frequency flood; locate on slowly permeable soils and avoid gravelly soils and shallow soils over fractured or cavernous rock; if self-sealing is not probable, use a synthetic or packed-soil liner; provide storage for the 25-year, 24-hour storm; follow specific loading guidelines for the geographic region. SCS Standard 633 includes guidelines for waste utilization or what may be called nutrient management. These guidelines recommend waste and soil analysis to determine application rates and provide tables for determining application rates for various crops.

There are additional requirements contained in each state's regulations, including, in some cases, ground water and surface water monitoring requirements. Virginia's General Permit includes specific requirements for animal waste management systems including lagoon siting and construction, buffers and monitoring. State technical requirements are summarized in the following table.

Public comment

Some state programs include requirements for public notification or comment on permits for new facilities. Georgia provides a 30-day public comment period on proposed Land Application System Permits. In South Carolina, any property owner whose property lines are less than 1,000 ft from a proposed site is notified of the proposed permit and must consent in writing to new lagoons.

Table

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Subject: Clean up Corporate Hog Farms
Date: Tue, 10 Jul 2001 14:19:34 -0400
From: Jay Sauber <jay.sauber@ncmail.net>
To: Jimmie Overton <Jimmie.Overton@ncmail.net>

http://www.ncpirg.org/hogs/
--
Mail:
Jay H. Sauber
NC Division of Water Quality
1621 Mail Service Center
Raleigh NC 27699-1621

Location:
4401 Reedy Creek Road
Raleigh, N.C. 27607
Phone: 919/733-6510
Fax: 919/733-9959

PROTECT OUR WATERS

NCPIRG's Campaign to Clean Up Corporate Hog Farms

Corporate Hog Farms Put Our Waters At Risk

Hog waste from the more than 2,200 North Carolina factory hog farms is one of the leading threats to our state's water quality and public health. In the last decade, the state's hog population has exploded from two million to nearly 10 million. These hogs produce 19 million tons of waste per year, which is stored in antiquated lagoons and sprayed onto crops. Chronic lagoon leaks and spills, combined with excess spraying of waste, sends tens of thousands of gallons of hog waste into our rivers, streams and coastal waters annually.

NCPIRG is working to clean up factory hog farms and require polluting hog farms, not the public, to pay to modernize their outdated and dangerous waste disposal systems.
NCPIRG

The Fouling of North Carolina's Waters

1.

At the average operation, 5,000 hogs excrete about 25 tons of waste every day.

2.

The waste, containing high levels of nitrogen and phosphorous, is collected on concrete slabs and then pumped into nearby open-air pits, or lagoons.

3.

Liquid waste rises to the top of the lagoons, emitting ammonia and methane into the air. Phosphates and nitrates can accumulate for months and often leach into groundwater and wells.

4.

When retention walls give way, gallons of waste are released into waterways, causing fish kills, nutrient pollution and pfiesteria outbreaks.

5.

Excess nitrates, phosphates, and toxic sludge are sprayed and spread on crop fields. Much of the waste runs off into nearby streams and rivers, and leaches into groundwater and wells.

6.

Excess nitrogen in hog waste evaporates and forms airborne ammonia, which rains down into rivers and streams, causing additional nutrient pollution.

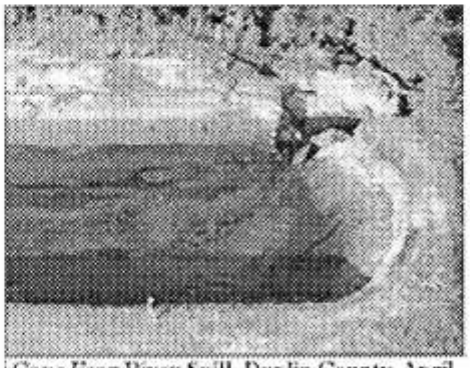
7.

Runoff from fields, waste from lagoon spills, and nitrates from ammonia in the air deplete rivers and streams of oxygen and choke aquatic life.

8.

Neighboring homes are surrounded by odor from hog farms, causing respiratory problems and sometimes vomiting.

Hog Waste Spills Around the State



Cape Fear River Spill, Duplin County, April 1999.
A hog farm owned by Murphy Family Farms spilled 1.5 million gallons of waste from a 25-foot hole, shown above, in a lagoon at a 9600-head hog farm. The spill contaminated the upper Persimmon Branch, which drains into the Northeast Cape Fear River.

North Carolina State University researchers found that more than half of North Carolina's hog waste lagoons leak, threatening our health and our environment. But lagoons retention walls also break–spilling millions of gallons of organic pollution into our waterways each year. Some of the largest spills include:

- **June 21, 1995:** Oceanview Farms in Onslow County spilled 22 million gallons of hog waste, twice the size of the Exxon Valdez oil spill, killing 15 million fish and closing nearly 365,000 acres of coastal wetlands to shellfishing.
- **August 8, 1995:** Broadwater Farms in Brunswick County discharged two million gallons of hog waste into tributaries of the Cape Fear River.
- **July 12, 1996:** Rhodes Livestock Farm in Craven County spilled 1.8 million gallons of hog waste into a small stream that carried it to

Mega-hog corporations like Smithfield Foods, which now owns 12% of the nation's hogs, are trying to avoid modernizing their outdated waste disposal systems and cleaning up the messes they've already made. According to the research group Democracy South:

Between 1995 and 1997, the hog industry spent $1.1 million in lobbying, ads and campaign contributions in North Carolina.

The polluter front group Farmers for Fairness spent $2.6 million in 1998 to unseat Rep. Cindy Watson (R-Duplin County), a champion of pro-environmental hog legislation in North Carolina. Farmers for Fairness funded 75% of her opponent's campaign.

In 1996, Governor Hunt received $119,000 from the hog industry, more than any other candidate up for election.

How You Can Help Protect Our Waters

You can help protect our waters and support NCPIRG's Campaign to Clean Up Corporate Hog Farms by:

1. Joining NCPIRG.

2. Calling the governor in support of his hog waste lagoon "phase-out" plan. Ask him to enforce all existing laws that help protect our waters from hog waste and to push for strong provisions to make the polluting hog farms, not the public, pay to clean up corporate hog lagoons.**Governor Hunt: (919) 733-4240**

3. Write your legislator. Ask him or her to support measures to make polluting hog farms pay to clean up corporate hog waste lagoons.