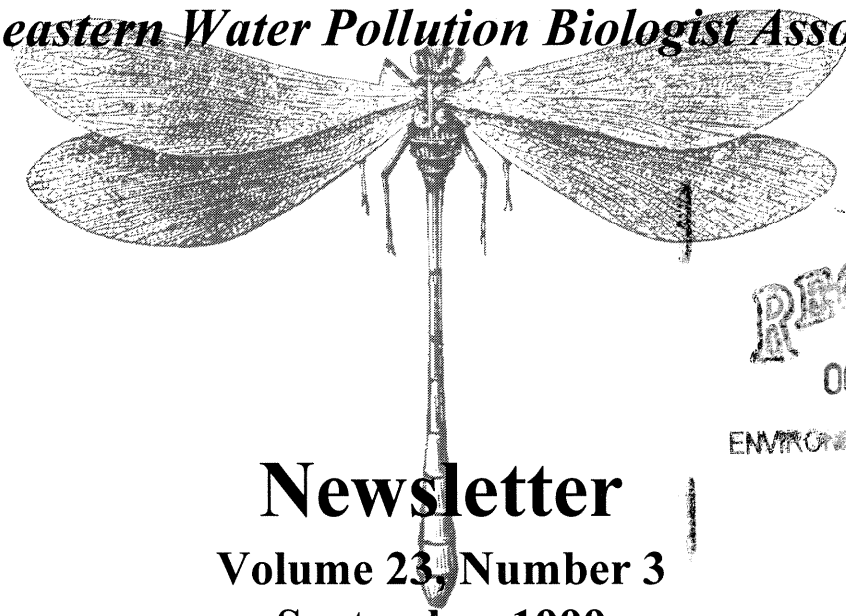
Done-C

SWPBA

Southeastern Water Pollution Biologist Association



Newsletter

Volume 23, Number 3
September 1999

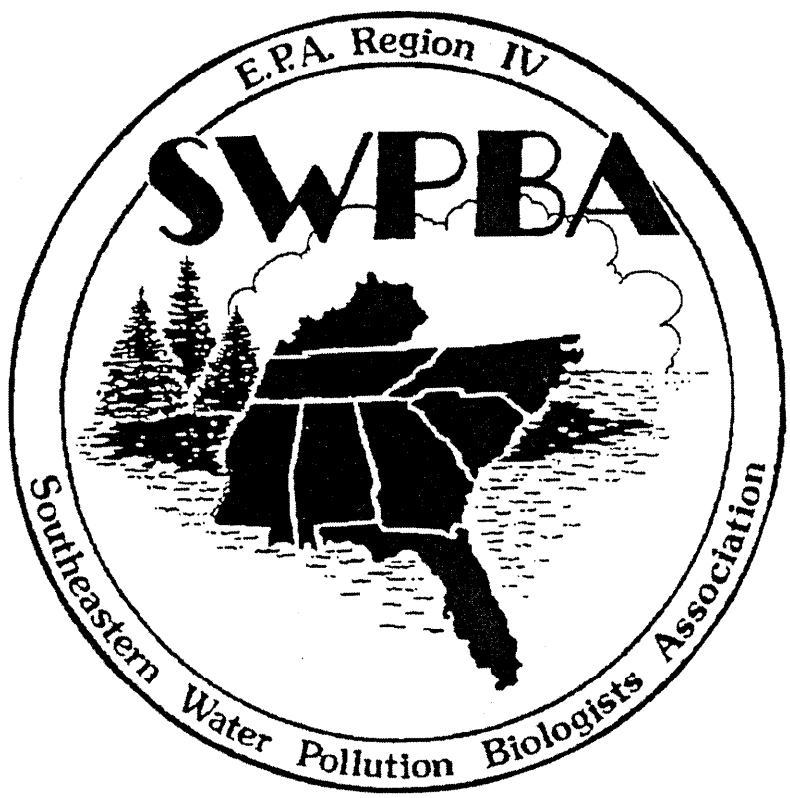


Table of Contents

SWPBA

Southeastern Water Pollution Biologists Association

Hello Everyone:

Things are beginning to come together for this year's annual meeting, October 26-28, 1999 at Springmaid Beach in Myrtle Beach, South Carolina. More details on the meeting site, hotel reservations, etc. are contained in this issue of the SWPBA Newsletter.

CALL FOR PAPERS

A draft agenda is contained in this Newsletter, but we still have room for a few more papers, so don't be shy. Please include the following:

Title
Author(s) and their affiliations
Who will actually be making the presentation
Abstract

HOTEL ACCOMMODATIONS

Take a look at the hotel reservation information located elsewhere in this Newsletter. The hotel cafeteria will be open during our meeting. Also, each room has a refrigerator and microwave (and coffeepot!) so you may want to do a little grocery shopping when you get there. Although the cutoff date for the room reservations has passed, the hotel has said they will continue to let people make reservations at the same rate as long as rooms are available, but you must use the reservation form enclosed in this Newsletter.

REGISTRATION, WORKSHOPS, & T-SHIRTS

The registration form can also be found in this issue of the Newsletter. Be sure to let us know your preference for workshops and T-shirt ordering information.

If there are any updates to phone numbers, E-Mail, and snail mail addresses please send them and related information to:

Jim Glover
Aquatic Biology Section
SCDHEC
2600 Bull Street
Columbia, SC 29201

Phone: (803) 898-4081
Fax: (803) 898-4200

E-Mail: gloverjb@columb32.dhec.state.sc.us

Any other business or questions should be directed to:

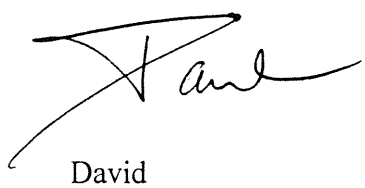
David Chestnut
Water Quality Monitoring Section
SCDHEC
2600 Bull Street
Columbia, SC 29201

Phone: (803) 898-4066
Fax: (803) 898-4200
E-Mail: chestnde@columb32.dhec.state.sc.us

CHANGES TO CONSTITUTION AND BY-LAWS

Please take a minute to look over the proposed wording changes in the SWPBA Constitution and By-Laws. These have been reviewed by and are acceptable to the Executive Committee. We will be voting to ratify these changes at this year's meeting.

I look forward to seeing you all in just a few weeks.



David

THE CONSTITUTION AND BY-LAWS OF THE SOUTHEASTERN WATER POLLUTION BIOLOGISTS ASSOCIATION

CONSTITUTION

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

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

Article 3. **MEMBERSHIP**. Membership shall be restricted to State Regulatory Water Pollution Biologists whose programs are funded through the Region IV Environmental Protection Agency and U.S. Environmental Protection Agency Region IV Water Pollution Biologists.

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

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

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

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

Article 8. **RATIFICATION AND AMENDMENTS**. The constitution may be amended by a vote of the general membership in attendance at the annual meeting, providing a quorum of two-thirds of the member agencies is present. Proposed amendments shall be submitted to the Executive Committee at least two (2) months before the annual meeting. The amendments

shall become effective upon ratification by a two-thirds vote by the general membership in attendance at the annual meeting. In an emergency, amendments may be ratified by a two-thirds majority of the members responding to a mail ballot within 30 days of issuance

BY-LAWS

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

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

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

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

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

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

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

Article 8. **RATIFICATION AND AMENDMENTS.** The By-Laws shall become effective upon ratification by two-thirds of the member agencies present at the annual meeting or two-thirds of the members replying within 30 days to a mail ballot. Proposed amendments shall be submitted to the Executive Committee two (2) months before the annual meeting, and voted on at the meeting with a two-thirds vote of a quorum of member agencies present at the annual meeting or by mail vote.

Replace Article 8 in its entirety with the following:

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

SWPBA Database Record

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

Name: _____

Title: _____

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

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

Agency: _____

Division: _____

Section/ Group _____

Address: _____

_____

_____

City State Zip Code

Special Interests or Projects: _____

_____

_____

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

1	Macroinvertebrate Taxonomy / Rapid Bioassessment	16	Standards, Water Quality Criteria
2	Toxicity Testing	17	305b
3	Laboratory Certification	18	Aquatic Macrophytes
4	Phytoplankton/Periphyton, Zooplankton	19	Ambient Trend Monitoring
5	Lakes/Reservoir Monitoring	20	Sediment Analysis/SOD
6	Estuarine Ecology	21	Culturing Organisms for Toxicity Testing
7	Marine Ecology	22	Computer Modeling/Applications
8	Wetlands	23	Coastal Program
9	401 / 404 Certification	24	Microbiology
10	Ecoregion Definitions	25	Permit Compliance
11	Estuarine/Marine Macroinvertebrate Taxonomy	26	Program Manager
12	Stream Surveys	27	Groundwater
13	Fish Taxonomy/Assessment	28	Algal Assay
14	Cercla Superfund	29	Chemical Analysis
15	Nonpoint Sources	30	Risk Assessment

1999 Annual Meeting of the
SOUTHEASTERN WATER POLLUTION BIOLOGIST ASSOCIATION
Springmaid Beach, SC October 26-28, 1999

Registration Form

Name _____

Agency _____

Mailing Address _____
_____
_____

Phone/Fax _____/_____

E-mail Address _____

$_____ Conference Registration Fee*:
Attendance every day + Wednesday evening banquet $30.00
Per day attendance only [days attending____] $10.00/day

$_____ Wednesday Evening Banquet only** $20.00/pp
This charge does not apply to those participants who have paid the conference registration fee of $30.00 to attend the annual meeting and banquet.

$_____ Conference T-shirt $10.00
The design will be of Region IV states showing the level III ecoregions. The T-shirt will be cream, all borders will be black and the streams will be blue.

Please specify quantity and size:

Small-_____ Medium-_____ Large-____ XL-_____ XXL-_____ Other-_____

Workshops
Beginning Weds. Oct. 27 at 1:30PM

Please indicate your first and second choices by placing numbers next to the workshops you wish to participate in. We will try to give everyone their first choice but because there will be space limitations there is a chance that you may be placed in your alternate choice.

_____ Tour of the Bell W. Baruch Institute Marine Research Lab.

_____ Habitat Assessment Workshop. Dr. Mike Barbour and Dr. Sam Stribling.
(Bring your own waders)

_____ Trichoptera taxonomic workshop. Dr. Mike Floyd
(Some microscopes will be provided but it would be helpful if you could bring your own microscope, forceps, etc.)

1999 SWPBA CONFERENCE
DRAFT AGENDA

(Please Note- this is a draft agenda. The groupings and order of talks will change.)

Tuesday, October 26

7:30am	Registration Opens
8:30am	Welcome Remarks, Sponsor Introductions, and Announcements By Dave Chestnut, 1999 SWPBA President
9:15am	Guest Speaker: Bob Van Dolah, SC DNR Development of Benthic Indices and sediment quality guidelines to assess habitat quality in southeastern estuaries.
10:00am	Break
10:20am	Mississippi's outstanding resources waters program. Mike Beiser, MS DEQ, Pearl, MS
10:40am	Year 1 of the wadeable streams regional REMAP. Peter I. Kalla, U.S. EPA Region 4, Athens, GA
11:00am	A classic case of eutrophication in a southeastern piedmont reservoir: legal and biological (phycological aspects). Jake Bickly: SCDHEC, Columbia, SC
11:20am	Using ATtILA (Analytical Tools Interface for Landscape Assessments) to estimate landscape indicators and target restoration needs. Jim Harrison (EPA Region 4), Don Ebert (EPA - ORD, Las Vegas), Tim Wade (EPA - ORD, Las Vegas and Dennis Yankee (TVA - ERC, Norris, TN)
11:40am	Biological assessment of the Ockawaha River and tributaries in Central Florida prior to river restoration. Dana R. Denson, FL DEP, Orlando, FL
12:00	Lunch- On Your Own

1:20pm	Indian Creek TMDL development: macroinvertebrate assessments. Matt Hicks, MS DEQ, Pearl MS
1:40pm	Multiple Reach (3 Bridge) NCIBI study. Neil Medlin, NC DENR, Raleigh, NC
2:00pm	Stream hammered or not, 'Tis the question? Morris C. Flexner, David L. Melgaard, Bruce A. Pruitt, U.S. EPA Region 4, GA
2:20pm	A comparison of multi-habitat aquatic macroinvertebrate sampling methods in streams of the Mississippi Alluvial Plain. B.G. Justus, D.G. Bray, A.T. Dossett, M.B. Hicks, R.J. Sarver, and M. Rogers, USGS, MS.
2:40pm	Recent Changes in the North Carolina criteria for benthic macroinvertebrate samples. David R. Lenat, NC DENR, Raleigh, NC
3:00pm	Break
3:20pm	An overview of South Carolina's toxicity program. David Graves, SC DHEC, Columbia, SC
3:40pm	A Baseline Environmental and Biological Assessment of Broad Creek and the Okatee River Estuaries (Beaufort County, SC). David Chestnut, SC DHEC, Columbia, SC

POSTER SESSION AND SPONSOR EXHIBITS

POSTERS:

Environmental assessment of large swine facilities
Matt Hicks and David Loch, MS DEQ Pearl MS

Mussel Toxicity Tests
Leslie Cagle, EPA-SESD

United States Water Quality Programs that Use Algae as a Biological Assessment Tool. Kroeger, S., Fensin, E., Lynch, K., Vander Borgh, M. North Carolina Department of Environment and Natural Resources-- Division of Water Quality.

Wednesday, October 27

7:30am	Executive Committee Breakfast Meeting
8:20am	Announcements
8:40am	Two new species of Trichoptera from South Carolina. Jim Glover and John Morse, SC DHEC, Columbia SC, Clemson University, Clemson, SC
9:00am	Crayfishes of the Licking River, Kentucky. Danny Peake, KY DOW, Frankfort, KY
9:20am	Special Session- How to evaluate streams that cease flowing during droughts-is there consistency in Region IV? Facilitators- Dave Lenat and Trish MacPherson, NCDENR, Raliegh, NC
10:00am	Break
10:20am	Preliminary ordination of Kentucky reference reach fish assemblages. Greg Pond, KY DOW, Frankfort, KY
10:40am	Pocotaligo Reclamation Project, Sumter Co., SC. Peyton Sasnett, Mike Pearson, and Roy Todd
11:00am	Keynote Speaker- Rudy Mancke, SC ETV, Columbia SC
2:00	<u>Workshops</u>

* Habitat assessment workshop. Dr. Mike Barbour
* Taxonomic workshop- Trichoptera. Dr. Mike Floyd
* Belle W. Baruch Marine Laboratory Tour

BANQUET
6:30pm

Thursday, October 28

8:20am	Announcements
8:40am	Group II wateshed Tina Robinson, TN DEC, Johnson City, TN
9:00am	Biological Assessment of Streams and Watersheds in Prince George's County, Maryland. James B. Stribling (Tetra Tech, Inc., Owings Mills, MD) and Sharon Meigs (Prince George's County [MD], Department of Environmental Resources).
9:20am	An Evaluation of Diatom Water Quality Metrics in Kentucky Lythia Metzmeier, Yi-Kuang Wang, and R. Jan Stevenson
9:40am	Special Session- Proportional multihabitat macroinvertebrate sampling vs. qualitative multihabitat collection methods. Facilitator- Dave Melgaard, USEPA, Atlanta
10:20	Break
10:40am	Special Guest- Geoff Scott, NOAA Fecal coliform source typing.

Buisness Meeting
11:30am
1999 SWPBA Conference Meeting Adjourned

LEROY SPRINGS & COMPANY, INC.

SPRINGMAID BEACH RESERVATION FORM

S W P B A

10/25/99 - 10/28/99

Name _____

Address _____

City _____ State _____ Zip Code _____

Home Phone _____ Work Phone _____

Arrival Date _____ Departure Date _____

Room Types	Requested	Availability	Price	Description
Live Oaks 4-Room Efficiency			$0.00	3 Bedrooms-1 King, 4 Queens, 2 Baths, Balcony, Sleeps 10
Live Oaks 2-Room Efficiency			$0.00	2 Bedrooms- 3 Queens, Balcony, Sleeps 6
Live Oaks Suite			$0.00	2 Queens, Sitting Area with Couch, Balcony, Sleeps 4
Live Oaks Regular Room		60	$74.46	2 Queens, Private Oceanview Balcony, Sleeps 4
Ocean Tower			$0.00	2 Queens, Private Oceanview Balcony, Sleeps 4
Ocean Double			$0.00	2 Queens, Private Oceanview Balcony, Sleeps 4
Ocean Window			$0.00	2 Queens, Window View of Ocean, Sleeps 4
Ocean Balcony			$0.00	1 Double, 1 Twin, Private Oceanview Balcony, Sleeps 3
Ocean Suite			$0.00	Queen Bedroom, Living Room with Sofa Bed, Sleeps 4
Courtyard 2-Room Efficiency			$0.00	2 Double Bedrooms (1 in Kitchen Area), Shower Only
Boulevard			$0.00	1 Double, 1 Twin, Overlooks Courtyard, Sleeps 3
Hallman House			$0.00	5 Bedrooms-2 Twins, 1 Double, 1 Queen, 1 King, 2 Baths, Sleeper Sofa, Dining & Living Rooms, Kitchen, Sleeps 12

RESERVATION DEADLINE

The deadline for making reservations is 08/26/99 . All requests for additional nights will be confirmed by written confirmation. Reservation forms may be returned to Springmaid Beach with one night's deposit (as indicated above) either by mail or fax. For accuracy and verification purposes, Springmaid Beach does not accept telephone reservations for group events.

CANCELLATION POLICY

Guests cancelling reservations at least 15 days prior to the arrival date will be refunded their entire deposit less a $10.00 processing fee. Cancellations made within 15 days of arrival will result in complete forfeiture of deposit. Changes in length of stay made within 15 days or upon arrival will result in complete forfeiture of deposit.

VISA OR MASTERCARD ACCEPTANCE

Credit Card Number _____ Expiration Date _____

I hereby agree to let Springmaid Beach charge the above credit card in the amount of $_____. Furthermore, I fully understand and accept the terms of Springmaid Beach's cancellation policy and agree that unpaid incidental charges remaining at check-out will be charged to my card.

_____

Signature (unsigned forms are considered invalid)

LOCATION

Springmaid Beach is located at 3200 South Ocean Boulevard in Myrtle Beach, South Carolina, a quarter mile across from the old Myrtle Beach Air Force Base.

Springmaid Beach, PO Box 423, Myrtle Beach, SC 29578, ph. (843)238-5189, fax (843)238-3392

LEGEND

- ★ State Capitol
- ◇ Town, Small City
- ◇ Large City
- Interstate, Turnpike
- US Highway
- State/Prov Boundary
- Population Center
- Interstate Highway
- US Highway
- Open Water

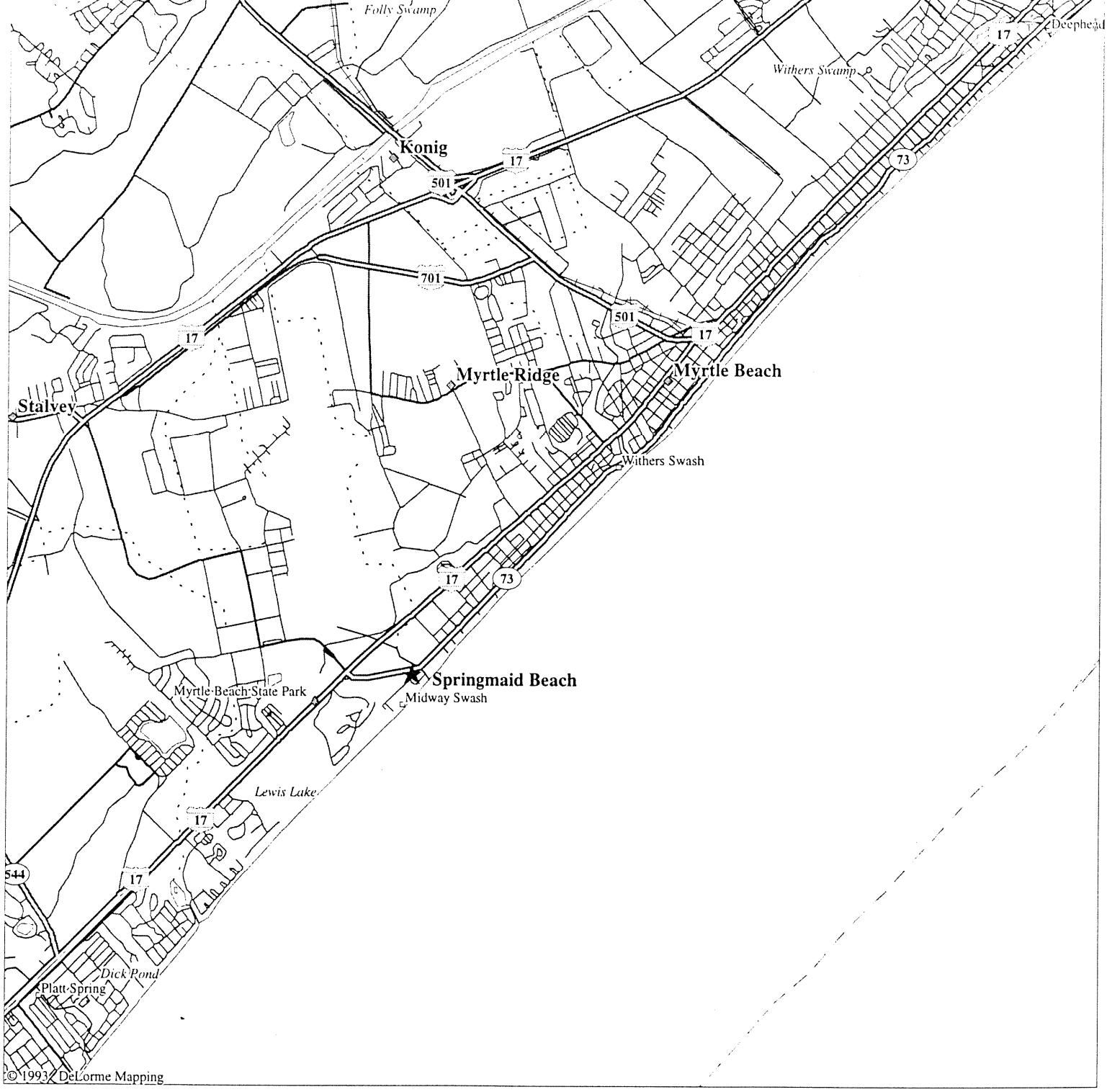
Scale 1:2,000,000 (at center)

20 Miles

50 KM

Mag 8.00

Tue Jun 01 14:15:21 1999



LEGEND

- State Route
- Geo Feature
- Town, Small City
- Park
- US Highway
- County Boundary
- Population Center
- Street, Road
- Major Street/Road
- State Route
- US Highway
- Railroad
- River
- Intermittent River
- Open Water

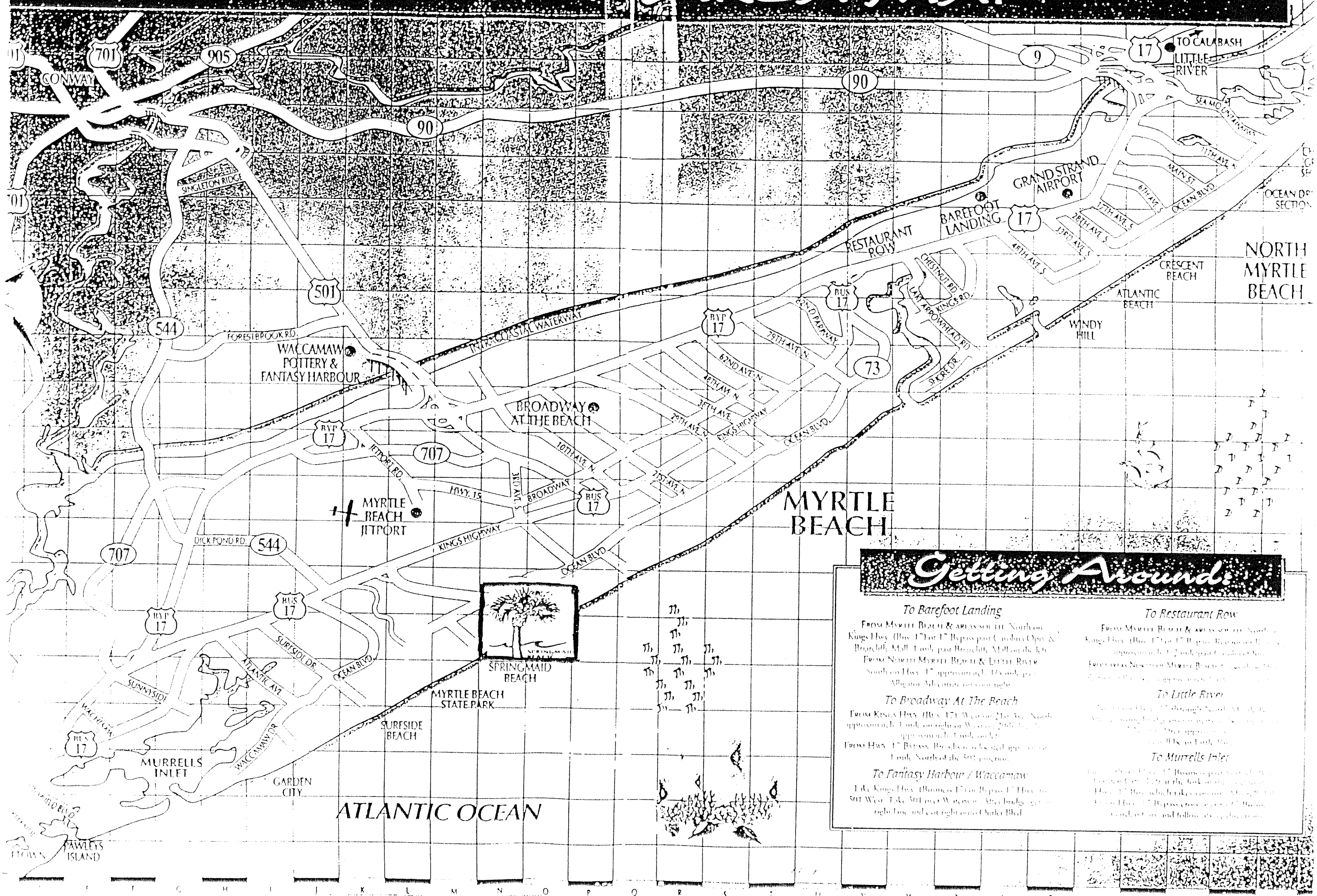
Scale 1:62,500 (at center)

1 Miles

2 KM

Mag 13.00
Tue Jun 01 14:22:42 1999

Myrtle Beach Area Map



Getting Around:

To Barefoot Landing

FROM MYRTLE BEACH & AREAS SOUTH: North on Kings Hwy. (Bus. 17) or 17 Bypass past Carolina Opry & Briarcliffe Mall. 1 mile past Briarcliffe Mall on the left. FROM NORTH MYRTLE BEACH & LITTLE RIVER: South on Hwy. 17 approximately 1½ mile past Alligator Adventure on your right.

To Broadway At The Beach

FROM KINGS HWY. (BUS. 17): West on 21st Ave. North approximately 1 mile on right or West on 29th Ave. N. approximately 1 mile on left. FROM HWY. 17 BYPASS: Broadway is located approximately 1 mile South of the 501 junction.

To Fantasy Harbour / Waccamaw

Take Kings Hwy. (Business 17) or Bypass 17 Hwy. to 501 West. Take 501 over Waterway. After bridge, get in right lane and exit right onto Outlet Blvd.

To Restaurant Row

FROM MYRTLE BEACH & AREAS SOUTH: North on Kings Hwy. (Bus. 17) or 17 Bypass. [illegible]

To Little River

[illegible]

To Murrells Inlet

[illegible]

EPA, Region 4
Science and Ecosystem Support Division
Ecological Assessment Branch

Stream bioassessments: MS TMDL - Staff of the Ecological Assessment Branch (EAB), the Environmental Services Assistance Team (ESAT), and the Water Management Division (WMD) sampled 49 stream sites in the South Independent Basin during July 26 - 30, 1999. Staff from the Mississippi Department of Environmental Quality (MSDEQ) assisted in all phases of this effort. Streams sampled were those listed on the 303(d) list. The study served as a pilot to test the approach to be utilized by the state in screening, via ecological health, the large number of sites on the 303(d) list. MSDEQ's Screening Level Bioassessment which involves sampling macroinvertebrates from the undercut banks and leafpack habitats. Study crews also collected water chemistry samples to be analyzed by MSDEQ.

Field and Laboratory Standard Operation Procedures, Quality Assurance Plan, and Safety Control Plan for Conducting *Sediment and Nutrient Total Maximum Daily Loads* - EPA-SESD, Athens, Georgia, has developed standard operation procedures for the following:

A total maximum daily loading (TMDL) is the sum of pollutants (loads) from both point and non-point sources plus a margin of safety (40 CFR 130.2 and CWA §303(d)(1)(c)). Pursuant to 40 CFR 130.7, EPA will review site-specific TMDLs submitted by states and provide guidance on TMDL development and application to state water quality standards. Components of TMDL development include: (1) problem identification; (2) develop numeric targets; (3) identify sources and sinks of the targeted pollutant(s); (4) link targets and sources; (5) allocate loads or controls among sources; (6) develop monitoring and review plan/schedule; (7) develop implementation plan. Developing, testing, and implementing field and laboratory standard operation procedures and quality control plans are essential in each of the above components of the TMDL process. The procedures herein are not meant as a replacement of established SESD SOP's, but as an adaption to sediment and nutrient TMDL sampling. Some procedures (e.g., macroinvertebrate and fish sampling) contained within this SOP represent a condensation of well established, peer reviewed Branch and Division SOPs.

In general, this SOP is organized with field procedures addressed first, followed by laboratory procedures, QA/QC plan, and traffic control plan. In addition, tested field and laboratory sediment SOPs, field assessment forms, and equipment manufacturer's instructions are contained in appendices. Each section is organized with a general discussion of the rationale, definition, and theory behind a sampling method. The general discussion is followed by apparatus or equipment recommended and procedures for its use.

Several spatial and temporal problems are inherent with suspended sediment and bedload sampling including: 1) resuspension of bed material by the sampling device itself; 2) cross-sectional and planform variation in the actual mean sediment transport rate; and 3) error associated with laboratory filtration and gravimetric determination of sediment concentration. Standard procedures need to be developed and tested that address these and other problems associated with dynamic sediment sampling and analysis. This SOP is a means of establishing and testing procedures that minimize the uncertainity in sampling and analyzing sediment.

The objective of this SOP is to provide guidance (field and laboratory procedures) on data acquisition, laboratory analyses, data quality, and data reduction and management.

Presently, the Draft-SOP is being peered reviewed and is slated for release in early November 1999. The finalized SOP will be available through the SESD web page or by contacting Bruce Pruitt at (706) 355-8713 or email: pruitt.bruce@epa.gov.

Wadeable Streams Regional REMAP - The first field season of the Wadeable Streams Regional REMAP project went very well, all things considered. Forty-six REMAP stations and 16 fixed state stations were sampled. Most of the state stations were ecoregion reference sites. We enjoyed several opportunities to share field time with our state partners.

A wide range of stream conditions were encountered. Most of the data are not available yet, but we will have information on water chemistry, nutrients, autotrophic index, mercury in Centrarchids, benthic macroinvertebrates (RBP II), fish (RBP V), and periphyton (RBP VI).

A landscape pilot project is still underway. Using contemporaneous aerial photography of a sub-sample of REMAP sites, we are attempting to link stream condition to landscape-level factors in the basin above the sample point.

Now that all of our procedures have been worked out under actual field and lab conditions, next year promises to be smoother and even more productive. An interim report from the first year is forthcoming.

ALABAMA

Reservoir Water Quality Monitoring (RWQM) Program

Intensive water quality monitoring of reservoirs in the Chattahoochee and Conecuh River basins was initiated April 1999. These reservoirs will be monitored monthly April-October at multiple locations. Collected data will allow ADEM to estimate the current water quality and trophic state of impounded waters of these basins. West Point and Walter F. George Reservoirs will be monitored for water quality effects of point and nonpoint sources as directed in the Feasibility portions of the Clean Lakes Program Phase I Diagnostic / Feasibility Studies of these two reservoirs. Current chlordane contamination levels of fish in the reservoirs will be investigated by collection of fish tissue samples. The water quality of Harding Reservoir, located immediately downstream of West Point Reservoir, will also be monitored in this project to determine water quality and current chlordane contamination levels of fish. The water quality of reservoirs in the Conecuh River basin, affected primarily by nonpoint sources, will be investigated as will levels of bioaccumulative contaminants in fish. Data collected by this project will be used to update the 305(b) Water Quality Report to Congress, ADEM Reservoir Water Quality Monitoring (RWQM) Program database, ADEM Fish Tissue Monitoring Program database, and will be added to the ADEM GIS database. In addition, data collected by this study will be presented at the annual meeting of the Alabama Fisheries Association.

Reservoirs of the Coosa, Tallapoosa, Tombigbee, and Escatawpa basins will be monitored once during August in accordance with the two-year monitoring rotation of all 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 Central Laboratory completed all analyses of tissue samples collected by the Section during Fall 1998. Results were forwarded to the ADPH, ADCNR, and TVA. A press release describing findings was prepared and issued. Input was solicited from cooperating agencies and planning was begun for Fall (FY 2000) sampling efforts.

For further information on the Fish Tissue Monitoring Program contact Chris Harman at (334) 260-2751 or cdh@adem.state.al.us.

Point / Nonpoint Source Assessment Programs

Environmental Indicators (EI) Section staff continued monitoring quarterly for water quality indicators at 12 stations within the Paint Rock River watershed. Pesticide monitoring was conducted at 10 stations during the months of May and June. Sampling will be continued in 1999 in association with the Paint Rock River Nonpoint Source Watershed Project.

For further information on the Paint Rock River Nonpoint Source Watershed Project contact Audra Jones at (334) 260-2754 or abj@adem.state.al.us.

The 1998 Nonpoint Source grant plan-of-study for the Tennessee River basin is in the reporting phase. Sub-watersheds will be ranked based on impairment from Nonpoint Sources as indicated by: 1) historical TVA fish IBI data, 2) chemical and bacteriological sampling; and 3) habitat assessments. This ranking will be utilized by the Nonpoint Source Section to focus their efforts of encouraging the implementation of BMPs in these subwatersheds. Subwatershed information regarding landuse and animal populations compiled by the local Soil and Water Conservation District offices is also being incorporated into the final report. Part II of the project included funds to collect additional data on selected 303(d) segments in the Tennessee Basin. Chemical sampling and habitat assessments have been completed. This information will be used to assist in developing the TMDLs for these segments.

State Parks Project

The final report for the study of watersheds associated with Alabama State Parks in accordance with the 104(b)(3) Study Proposal entitled *Monitoring of Watersheds Associated with*

Alabama State Parks Utilizing Chemical, Physical and Biological Assessments was completed and is available for distribution. Determinations of landuse, measurements of water quality in the stream, aquatic macroinvertebrate and fish assessments are presented in the report.

For further information on the State Parks Project contact Chris Harman at (334) 260-2751 or cdh@adem.state.al.us.

Reference Site Selection

Preliminary office preparation has been completed to begin ecoregional reference site reconnaissance in the newly revised subregions in the northern half of Alabama. Field reconnaissance will begin as soon as the leaves have mostly fallen.

Data Management/Storage

The 104(b)(3) Project titled *Enhancement of ADEM's Watershed Assessment Capabilities Through Improved Methods of Transfer and Access to Water Quality Data* is continuing. User testing of a major portion of the database is ongoing. Help files and a User Documentation Manual have been drafted and are being used during user testing. For more information on this

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

It's time for the third and final 1999 Georgia installment to the SWPBA newsletter. The Water Protection Branch has settled nicely into our new facility here 9 miles south of downtown Atlanta. There's still a few little bugs to work out, and I'm not talking about those preserved in the lab! Anyone found my box of 1998 lake reports? Our new facility is quite comfortable and well designed. To reiterate, our new address is:

Georgia Department of Natural Resources
Environmental Protection Division
Water Protection Branch
4220 International Parkway
Suite 101
Atlanta, GA 30354

Program phone numbers are:

Branch Chief (Alan Hallum)	404/675-6232
Engineering and Technical Support Program (Bob Scott)	404/675-6233
NonPoint Source Program (Larry Hedges)	404/675-6240
Permitting, Compliance and Enforcement (Jeff Larson)	404/675-2680
Watershed Planning and Monitoring Prog. (Mork Winn)	404/675-6236
WPMP Fax:	404/675-6244
E-mail: first name_last name@mail.dnr.state.ga.us	

Please update your records, and stop by to visit us the next chance you have. High Occupancy Vehicle (HOV) interstate lane design makes it necessary to use access roads to reach us if you're driving alone, so call for detailed directions your first visit! We're off I-75 south of Atlanta. Use exit 82 onto Aviation Boulevard. Turn left onto Aviation and look for us a block or two down on the right at International Parkway.

Summer has been busy as usual. As most of you already know, the south is in the middle of its third year of drought. Besides our usual major lake, time of travel and basin studies, we've been working on additional drought-condition lake and tributary work throughout the state. Another group has been doing only habitat and macro invertebrate assessment in support of the TMDL process. Lake Standards sampling continued on three lakes, and recommendations were made for standards on two additional ones. Where did the summer go?

SIGNIFICANT ACTIVITIES

In accordance with the "zero tolerance" policy adopted by the Board of Natural Resources, a total of 10 Consent Orders were executed in the months of July and August, resulting in total fines of $25,650. These collected fines covered permit violations and sanitary sewer overflows in the metro Atlanta area.

On July 19, EPD issued the General NPDES Permit that will regulate the discharge of storm water from construction sites. The issuance represents the culmination of a years work to prepare a document that was acceptable to all parties involved. Legal challenges to 4 previous permits issued since 1992 successfully prevented implementation of earlier wording. The Permit will enable EPD to effectively regulate storm water discharges from construction sites and common developments of over five acres. The Permit requires erosion control plans and maintenance of best management practices (BMPs), weekly inspections, monitoring receiving streams for turbidity during rainfall events of ½ inch or greater and monthly reporting to the appropriate EPD Regional Office. EPD received 400 pages of comments from 80 entities, most of which were in the regulated community. The Permit was to be become effective September 1, 1999.

On August 18, 1999, three administrative appeals were filed regarding the above mentioned storm water permit. Thirteen companies were responsible for the filing. These appeals were forwarded to the Office of State Administrative Hearings, where they effectively halted implementation of the general permit. In the interim, EPD is encouraging all operators of construction activities to use BMPs as specified in the appealed NPDES permit to control silt, sediment and other pollutants which are carried by storm water runoff from construction sites.

In July, the Lt. Governor's Erosion and Sedimentation Control Technical Study Committee, know as "Dirt II" met with the contractor working on the computer model to graphically display total suspended solids (TSS) using various best management practices (BMPs). The information presented was used to make final selections regarding which equations to be incorporated into the model. When the group met in August, the main focus of the meeting was how to integrate the monitoring of construction site activity under the computer modeling element with a similar monitoring activity under the demonstration/outreach element.

Rivers Alive! is the theme for the 8th Annual River Clean Up Week scheduled for October 9-17, 1999. This years state-wide clean up event will be co-sponsored by the Department of Natural Resources and the Keep Georgia Beautiful organization. Harold Harbert with the NonPoint Source Program has been working diligently to develop a Public Service Announcement and a web page to promote this year's event. Corporate sponsors hare donated funding to provide t-shirts to volunteers.

Georgia Adopt-A-Stream is in the process of writing new monitoring manuals. This summer, the focus has been on Watershed Assessment and Visual Stream Surveys. Both manuals have data forms and protocols that have been reviewed by more than 30 professionals

from all regions of Georgia. The new manuals will have watershed information pertinent to Georgia. The data from these forms are inclusive of all regions of Georgia and allow for varying levels of volunteer knowledge and involvement. Once the manuals are completed, the chemical and biological monitoring manuals will be revised.

In conjunction with the development of Supplemental Water Quality Standards for Lakes Allatoona and Lanier, meetings were held in July with various local governments, Federal and State agencies, and environmental organizations to solicit input on what issues need to be considered by EPD as the process moves forward. In August, the Water Protection Branch issued a public notice regarding amendments to the Rules and Regulations for Water Quality Control to add specific water quality criteria for these two lakes. Public hearings will be held in late September and early October to receive comments on the proposed criteria. The Lake Lanier Water Quality Study Committee met in August to review information on the water quality of Lake Lanier and issues regarding it. They have been charged by the Georgia General Assembly to develop recommendations regarding how the issues should be addressed in coming years.

On August 2, the WPMP hosted a Hydrolab training workshop, using our laboratory area as the training room. Ten associates of the WPMP and two from the Northeast Georgia Regional Office attended, as well as employees from two private firms.

Intensive Surveys Unit (ISU)

Intensive surveys has been quite busy this summer. Lake Standards Compliance Sampling has continued, with monthly sampling of Lakes Walter F. George, Jackson and West Point. Sampling began in April and will conclude in October. Early sampling data indicates that the lower water levels from summer drought conditions coupled with warm weather and sunny skies may be elevating chlorophyll a levels somewhat, though the lakes currently meet set standards.

The Major Lakes Monitoring Program is up and running for 1999. Lakes Oconee, Sinclair, High Falls, Juliette and Tobesofkee will be sampled every quarter this year. Lakes in the state of 1,000 acres or larger are being studies as their respective basins come under scrutiny under Georgia's five year rotating Basin Management Program. The next scheduled series of samples will be collected in November.

An additional five major lakes were visited for Supplemental Drought Sampling. These were Carters Lake, Hartwell, Russell, Clarks Hill and Seminole. Located in different areas of the state, they were chosen to indicate how watersheds in different geographical areas were being affected by the drought. Water temperatures were generally higher and water levels generally lower.

ISU also worked on a South Georgia Irrigation/Gaging Project, the Talapoosa River Flow Gaging Project and the Ochlockonee River Modeling Project at Moultrie and at Thomasville. Our Atlanta based staff spent many hours traveling to and from south Georgia this summer!

Ambient Monitoring Unit (AMU)

In May a team of eight people from USEPA, NRCS and Georgia DNR spent a week in the field evaluating proposed reference sites and ecoregion boundaries. This trip was very successful and several important decisions were made. However, there was not enough time for all proposed reference sites in each subregion to be visited and considerable work is left to be done in identifying proposed sites.

AMU's SOP for Bioassessment is currently under revision and should soon be available to others through the GA DNR website.

Associates began sampling and evaluating watersheds of 75 303(d)-listed streams in the Oconee and Ocmulgee River Basins. These streams are a subset of the streams listed for those basins in the 1996 303(d) list due to impaired fish communities. The 75 streams are those recently resampled by the Wildlife Resources Division (WRD) which continue to have fish impairment warranting 303(d) listing. The AMU is doing the follow-up sampling and "cause and source" documentation at each of these sites. At each location, samples are collected and a habitat assessment is conducted. The cause of impairment (chemical, sediment, etc...) Is determined and documented. The watershed is visually inspected to identify the specific potential sources (WPCP discharge, cattle farm, urban run-off, etc...). The information collected will be used to develop total maximum daily loads (TMDLs) for each of these watersheds.

Employee Recognitions

The Branch welcomed two new employees in July and one in August. Ms Robin Blevins will be working with the NonPoint Source Program, Mr. Don Schreiber began working with the Modeling and Planning Unit and Scott Sams came on board as Project Administrator in the Outreach Unit of the NonPoint Source Program. Welcome to all of our new associates.

Hope to see everyone in South Carolina for the yearly conference in October!

Kentucky News

Ecological Support Section

After 30+ years of service to the Division of Water, countless stories, mishaps, good deeds, and numerous contributions to the science of bug-watching, Ron Houp has decided to retire to the farm. According to Ron, now "every night is Friday night, and every day is Saturday." His departure takes along a vast amount of knowledge, but his presence here every day disseminated a little of that knowledge to those of us who followed him. While he obviously cannot be replaced, someone has to fill his space...we've shuffled duties around a little. Greg Pond will move into Ron's place as the Reference Reach program bug guy, and Mike Compton (AKA "Stretch") will be the Reference Reach fish biologist. A newly hired biologist, Denise Moyer, will join Lythia Metzmeier and Skip Call in the Watershed Biological Monitoring Program as that program's fish biologist. We're all still working under Mike Mills, who does what he can to keep track of us, along with Gary Beck, microbiologist of all programs, and Morgan Jones, master of the Wild Rivers.

The Ecological Support Section spent the early part of the year identifying the samples from the Kentucky River Watershed monitoring that was completed last fall. Almost all the samples have been ID'd, but we still need to get the reports written up and figure out how many stream miles we assessed in the basin. Meanwhile, we're sampling sites in two other basins for this year's sampling effort. Unfortunately, sampling came to an abrupt end sometime in August when all the streams dried up...we're in a drought comparable to the one in 1988, and even though it's raining as I type this, (the first rain in a month), we're about 8-10" below normal in parts of the state. Wouldn't you know, those would be the parts containing the Salt and Licking River basins...we got about half of the samples that we had planned on.

We did take time out from that to assess the effects of about 30,000 gallons of paint that spilled into a Lexington, Ky. Stream (Town Branch) after a fire decimated the paint factory. There was a pretty severe fish kill in Town Branch, but the after it entered South Fork of Elkhorn Creek, there was enough dilution to prevent any more fish from being killed except for some (about 100) in a long deep slow-moving pool above an old mill dam. It was pretty impressive for a few days, though. The water was the color of skim milk...not very inviting!

We also had a nice fish kill in June, and have attributed it to a Cryptomonas bloom:

Surface algal samples from Wednesday, 6/30/99, contained planktonic algae in relatively high concentrations, especially in the area where most of the dead fish were. No one particular species dominated the assemblage, and no known toxic species were present. Chlorophyll *a* levels in samples collected on Wednesday afternoon were between 11 and 32 micrograms per liter. These are comparable to chlorophyll samples collected from the Kentucky River at Camp Nelson in the

past. Kentucky has no chlorophyll *a* standard, however the standard in North Carolina is 40 ug/l. Analysis of a water sample collected by Ky. Dept. for Fish and Wildlife Resources on 7/1/99: This sample contained a bloom of algae identified as *Cryptomonas*. *Cryptomonas* is a small (25-40 micrometers), single-celled, free swimming algae. The pigments it contains can cause its color to vary from green to brown to red. The sample was collected from a distinct "copper-colored" bloom found approximately 1 mile downstream of the Brooklyn bridge (U.S. 68). *Cryptomonas* is not known to be toxic, but may cause taste and odor problems for drinking water suppliers.

The fish kill in the Kentucky River could have been the result of an algal bloom. Conditions consistent with that possibility include: high (supersaturated) dissolved oxygen at the surface, low (as low as 2.5 mg/l) DO at 10 feet below the surface, high (8.5-9) pH, presence of a copper-colored bloom of algae identified as *Cryptomonas ovata*, an greenish-brown color in the water not directly affected by the copper-colored bloom. The DO directly in the bloom was greater than 20 mg/l (off the meter's scale).

The fish had been dead about two days before phytoplankton samples were collected, so it is possible that the major portion of the bloom was missed. A possible scenario for the fish kill is that an algal bloom die-off, combined with respiration by both the remaining algae and bacteria caused a DO sag that killed the fish. This may have occurred during the cloudy days (Sunday and Monday).

On July 9, Lythia flew with Fish and Wildlife over the Kentucky River. At that time, the *Cryptomonas* bloom was red in color and therefore easy to spot from the air. It stretched from approximately the location of the Bluegrass Parkway bridge upstream to the mouth of Hickman Creek (about 50 river miles.) On July 30, the flight was repeated, but she did not observe any reddish color in the water. The river was a "murky" green color, flow was extremely low, and the potential for algal bloom problems was still very high. The Kentucky River upstream of Lock 8 looked somewhat clearer, but still green. On September 6, "red water" was reported by a fisherman on the Kentucky River. On September 8th, John Brumley, Skip Call, and Denise Moyer went to investigate, and discovered the *Cryptomonas* bloom was back! Dissolved oxygen levels were again off the meter, and pH was up around 9 again. Two drinking water plants in the vicinity reported pH problems that same day. While it has not caused any other fish kills, the bloom has been around all summer, impacting water quality and harassing drinking water suppliers.

Bioassay Section

With the Division coordinating stream monitoring by watersheds, we have concentrated our testing in the Salt and Licking River watersheds this year. To date Whole Effluent Toxicity tests have been performed on 10 major facilities. Each testing event includes acute or chronic multi-concentration tests using both species (*Pimephales promelas* and *Ceriodaphnia dubia*). If toxicity is demonstrated, the facility is notified to immediately perform its own retest. Further action depends on the results of both tests.

We have reviewed 551 toxicity test reports submitted by permittees as part of the

biomonitoring permit requirement. Eleven facilities are currently undergoing a TRE. One facility has recently received a NOV for failure to submit the required quarterly progress reports.

In April, Bioassay section staff participated in 2 EPA Region IV PAI audits. The audits were performed on consulting labs running toxicity tests for permittees in the state. These audits provide an invaluable service in ensuring proper procedures and methods are being followed. This in turn ensures that reliable data is generated in fulfillment of KPDES WET conditions.

In addition, EPA also performed an audit on our toxicity testing lab. We feel this audit went very well with some very useful suggestions and recommendations made by EPA to help us improve our program. I would like to thank Lisa Spurlin and Ron Weldon for their thorough and honest evaluation of our facility.

The section has been publishing our quarterly newsletter for the past several years. This has been and still is well received by those who take the time to read through it. Susan Cohn is currently developing a web site for the section. We will shortly be able to provide all WET information in this electronic format.

Finally, Betty Beshoar has been actively developing the capability to perform whole sediment toxicity tests. In May we got the first opportunity to use this test in a decision-making role. Two marinas on the Ohio River petitioned the 401 Certification Section to dredge their facilities and return the spoil to the river channel. We were requested to test the sediment to determine if this could be done. Toxicity tests along with chemical analysis were performed on 4 sites. While the toxicity tests showed no toxicity, the chemical analysis showed elevated PCB levels. If this material is removed, it must be taken to a hazardous landfill for disposal.

Nonpoint Source Section

The Nonpoint Source Section has been extremely busy since the last newsletter. All of the new positions that we have requested to be established in the last six months have been approved, and we are trying to get the paperwork on all of these started. We are sorry to announce that our long-time secretary, Mariam Wiley, decided to move into the Water Quality Certification Section. We are all lost without her. However, we are excited to have Edith Fultz join our program. Hopefully, she won't mind all of us asking her the endless questions we seem to come up with! We are also pleased to announce that Danny Peake will be joining our section as the new biologist on June 16. Danny is currently working for the Water Quality Branch as an interim biologist while he works on his masters degree at Eastern Kentucky University. Somehow, we suckered Danny into joining us in the wild world of nonpoint source pollution! Our Data Manager, Nel Ruffin, left for greener pastures with the University of Kentucky to serve as the basin coordinator for the Kentucky River. Her replacement, Peggy Jackson, is actually going to serve as a Technical Coordinator and our Agriculture Liaison (It's all in the title). One of our Grant and Contract Managers left after only a few months. Nonpoint source just wasn't his "thing" – actually, Corrine scared him off.... Anyway, a decision on his replacement has been made, and hopefully the person will be able to start

soon. After identifying the need for an Education Coordinator about 5 or 6 years ago, we were finally given the OK to hire one. Rosetta Fackler joined our staff along with Peggy Jackson, and will give NPS education in Kentucky a much needed kick-start. Due to our workload, we are also pleased to have Rodney Pierce on as an interim biologist/QA/QC specialist. He has helped the biologists out quite a bit in the short time he has been here. Finally, we have hired an Environmental Scientist that will hopefully start the beginning of next month. This person will work as a liaison between the Division of Water and the Health Department on On-Site Wastewater issues – basically, "Straight pipes R us." With all of the staff changes we've had, we're still trying to get to know one another. One thing's for sure, we have enough people in the Section to have our own basketball team - with reserves!

Before departing, Nel Ruffin completed a massive work detailing all of the nonpoint source impacts from the last 305(b). The Kentucky Nonpoint Source Assessment Report lists 373 stream segments totaling 3944.8 miles in length and 37 lakes with total surface area of 115,763 acres as degraded by nonpoint source pollution. The majority of the state's degraded streams and lakes were assessed as impaired by pollution from nonpoint sources. The report is a "must have" for anyone involved in NPS monitoring, at least if you're in Kentucky! Anyone else interested can contact Edith Fultz at (502) 564-3410.

The biologists are still working away on the final touches of our large watershed demonstration projects. The final report on the second of those four projects, an interstate project that was coordinated with Tennessee, is now available. For a copy of the "Big South Fork/Bear Creek Nonpoint Source Interstate Demonstration Project" contact Steve McMurray at Steve.McMurray@mail.state.ky.us. The final reports on the two remaining projects are underway. With luck, they'll be done in a timely manner and we can begin planning for next year.

Kentucky has also just submitted its FFY 99 319(h) Grant, requesting $3,416,800 to fund Base and Incremental projects. A total of 26 projects have been included ranging from various assessment projects in the Upper and Lower Cumberland River basins to developing regional curves for the design and assessment of natural channels.

401 / Water Quality Certification Section

We recently collected the third set of biological data for the Buck Creek Gravel Dredging Project. The geomorphological data collection for this project is about 70 percent complete.

The 401 Program is taking a closer look at dredging operations, particluarly along the Ohio River. We are attempting to get a better handle on water quality/biological impacts from these operations, including toxicity problems from contaminated sediments, in order to determine if we need to change how we regulate them.

Because of recent litigation in West Virginia, there will be major changes in how Kentucky regulates coal mining under the Section 401 and 404 (CWA) programs. The most significant changes will be the requirment of an Individual Section 404 permit form the Corps of Engineers in

some cases, and the threshold for when stream mitigation will be required is to be lowered.

Jeff Grubbs left the 401 program, effective June 16, to go the the Drinking Water Branch. Jeff had a long history with the 401 program and has been an instrumental force in its development. Tracy Hurst will be joining the program October 1. She is a wildlife biologist and will be transferring from the Department of Surface Mining.

MISSISSIPPI HAPPENINGS

Well, another sampling season almost completed, and this year (so far at least) someone else got the hurricanes. On a serious note, we express our sympathy to our colleagues who were affected by the damage wrought by Floyd and Brett. Our staff have been busily carrying out projects to address the issues of concern in the Big Black and Tombigbee River basins, and we are beginning preparation of the Yazoo River Basin (DELTA) status report.

Ambient Biological Monitoring

Regional Biologists responsible for ambient biomonitoring have nearly completed all of the sampling. Laboratory work is pending.

Northern Independent Streams, Tennessee River, and Southern Coastal Streams Basin Studies

Identifications and analysis of the samples collected from the Southern Coastal Streams and Northern Independent basins have been completed. Identification and analysis of the material collected from the Tennessee River Basin is nearly complete.

Big Black River Basin

Thus far, 28 of the 35 sites have been bioassessed, and 11 sites have had water samples collected for chemical specific monitoring. It is anticipated that the remaining sites will be completed in the near future. Analysis of the macroinvertebrates collected from several of the sites has begun. With the near drought conditions present in this basin this year, numerous sites have been pooled up when our staff visited them for bioassessments, and these sites have not been done. Fish for tissue analysis has been completed at all 5 sites within this basin, and 5 TMDL and WLA studies have been completed, with data yet to be analyzed. Our staff is continuing to work with fishery biologists from the Department of Wildlife, Fisheries and Parks to determine the status of the catfish fishery of the Big Black River. Some IBI work is also scheduled to begin soon.

Tombigbee River Basin

Among the issues being addressed as a part of the study of this river basin are: 303(d) listed "evaluated" streams; the trophic status of the Aliceville Pool of the Tennessee-Tombigbee Waterway; Special studies on the Buttahatchie River and Luxapallila Creek, and the Tenn-Tom. Waterway near Aberdeen, MS; and several TMDL and WLA studies. # sites have been scheduled for bioassessment, and # have been completed thus far. In addition to the drought related problems, another issue is the backwaters from the Tenn-Tom. Waterway and the effect upon the tributaries when staff visit for the purposes of conducting bioassessments. Eleven TMDL and WLA studies have been completed and are being identified and analyzed. All sites scheduled for fish tissue collection have been sampled. The study on the Aliceville Pool will begin the first week of October.

Yazoo River Basin

The millennium's first basin study will be the Yazoo River Basin, which contains the ecoregion known as the "DELTA". This region is highly agriculturalized, and approximately one half of the segments on the state's 303(d) list are within this basin. Biological Services Section staff have provided technical assistance in the preparation of the Basin Status Report to be distributed to the public upon completion.

EPA and MS DEQ sample the Southern Independent Streams Basin

In July, Hoke Howard, Dave Melgaard, Ed Decker and several EPA contractors visited Mississippi for the purposes of "accelerating" the monitoring of the 303(d) listed streams by assessing just over 50 streams in the Southern Independent Basin. Reconnaissance visits were made in mid-July with actual sampling occurring a week later.

TMDL Study on Indian Creek

The 303(d) List of Impaired Waterbodies for the State of Mississippi includes two segments of Indian Creek located in Tishomingo County, Mississippi. As mandated by the Clean Water Act, development of TMDLs for those pollutants impairing any use of this waterbody is required. A study was conducted in September, 1998 to develop TMDLs for Indian Creek. In conjunction with this study, macroinvertebrates were collected at four sites along Indian Creek to more fully document Indian Creek's current water quality status, and to further pinpoint the source/s and location/s of impairment. Findings from this study are summarized as follows:

(1) The bioassessment indicated that IND1 (an upstream control) was nonimpaired and IND2 (just below the outfall of the WWTP) and IND3 (furtehr below the WWTP) had the poorest biological condition, and were rated slightly impaired during this study. IND4 (the furthest downstream site) was also rated slightly impaired, but scored higher than IND2 and IND3, and is considered to be of better water quality.

(2) Based on the bioassessments, IND1 and IND4 were determined to be "fully

supporting" of their water use classifications; whereas, IND2 and IND3 were found to be "partially supporting" of their water use classifications.

(3) Habitat assessments indicated optimal habitat for colonization at all sites and no scores varied more than ten percent from the reference site. Therefore, habitat degradation is not a factor in the listing of Indian Creek as impaired.

(4) Various chemical parameters displayed spatial variances among Indian Creek sites. The most drastic differences occurred between IND1 and IND2. Parameters involved were TOC, TSS, TDS, Conductivity, D.O., % Sat., TKN, ammonia, TBOD, BOD5, and chlorophyll-a concentrations.

(5) The biological communities and chemical parameters evident at IND2, and in comparison to other sites, indicate organic enrichment. The source of this enrichment is clearly from the City of Iuka's WWTP.

(6) Biological and chemical data also suggest slight improvement in water quality at ND3 and almost complete recovery at IND4.

Fish Tissue Monitoring Program

In addition to the fish tissue collected to address issues during the whole basin studies, twenty-three additional sites throughout the state have been collected for ambient monitoring purposes. Two sites remain to be sampled. To address the concerns regarding Mercury, 20 sites have been collected. At one station, the Jourdan River, the collection is incomplete. All fishes which were collected to assess the levels of dioxin on the Leaf River have been collected, processed, shipped and analyzed. Data has been received on these fish. The fisheries section continues to have an oversight roll concerning dioxin contamination on the Escatawpa River. Fish collections by the contractor have been completed as scheduled, however no data has been submitted.

Non-Point Source Studies

The Biological Services Section is in the process of implementing long-term monitoring plans aimed at evaluating Best Management Practices (BMP's) within six watersheds throughout the state. Watersheds to be monitored include Moon Lake, Cane/Mussacunna creeks, West Fork of Pushepatapa Creek, Twentymile/Donovon creeks, Upper Bogue Phalia Creek and Souinlovey Creek. Among the BMP's to be evaluated are drop structures, risers, no-till practices, conservation tillage, and animal waste BMP's. Farming practices within these watersheds include cotton, corn, rice and dairy farming. Frequency of sampling will vary depending upon land use and type of farming practices within each watershed.

NORTH CAROLINA

We are tired of hurricanes. Each seems to have its own personality. Floyd's is all bad. Flooding from Floyd has far surpassed anything witnessed by the living in this state. All of the pictures you have seen on national news fail to provide full appreciation for the problems in North Carolina's coastal plain. If we can get past the immediate we will try to bring some sort of summary to the meeting in October. Information below summarizes activities prior to Dennis and Floyd. We look forward to seeing our fellow biologists soon.

Biological Assessment Unit
Benthos

The benthos group logged a lot of miles this summer, sampling nearly everywhere but near home. 107 samples were collected this summer. Most were collected in the Savannah, Little Tennessee, Watauga and Hiwassee basins in the western mountains, where we passed up the opportunity to pay admission to see Eric Rudolph's microwave. We also sampled the Roanoke basin, which we share with Virginia, and the White Oak basin to the east, which is mostly beaches, estuaries and swamps. It is now mostly underwater from two hurricanes within three weeks (Dennis and Floyd) dropping over two feet of rain in the area. So much for sampling those last three sites.

We have been working with The Nature Conservancy to identify strange and rare bugs in the Roanoke basin to assist TNC's land conservation efforts in the lower Roanoke. Other new finds around the state include: *Serratella spiculosa* – which hasn't been reported from NC since 1963, and *Baetopus nearcticus* from the Panthertown valley. This new species is the fourth in this genus, *Baetopus* having been previously found only in Europe and Mongolia.

Some of the permanent features in North Carolina include the Appalachian Mountains, the Atlantic Ocean and Dave Penrose. Imagine, then, everyone's shock when Dave left the bioassessment unit in August and moved down the hall to the wetlands group. It wasn't quite as cataclysmic as the Appalachians taking three giant steps toward Tennessee, but it was close. Dave finds himself excited by the new challenge of developing biological monitoring protocols for evaluating stream restoration projects. Good Luck Dave!

In other developments, Dave Lenat has a new publication out. Make his day and ask him for a copy. Pescador, M.L., D.R. Lenat and M.D. Hubbard. 1999. Mayflies (Ephemeroptera) of North Carolina and South Carolina: an update. Florida Entomologist 82: 316-332.
Larry Eaton has been periodically giving advice to New Jersey as they begin to develop methods and metrics for biological monitoring of their estuaries. As a result, he was invited to participate in a workshop in early October to help develop biological criteria for estuaries in Region III.

Special Studies
Most streams sampled this quarter because they were on the 303d list, were still impaired.

Tributaries to the Cullasaja River were sampled to supplement 1996 sampling of the mainstem to better define the extent of the High Quality Waters (HQW) reclassification request. Most tributaries, with the exception of those around the town of Highlands, could qualify for reclassification to HQW.

Barber Orchard, an old apple orchard that has been developed into a residential tract, was found to have soil and groundwater contaminated with pesticides. Invertebrate sampling in UT Richland Creek showed that pesticides were impacting the stream community as well. This is becoming a growing problem in NC, as land that has been used intensively for agriculture for decades is converted to suburban sprawl.

Wilson Bay, an oligohaline estuary, was found to have improved, but not completely recovered, following removal of Jacksonville's 4 MGD WWTP discharge last year.

Fish Community Activities

The wadeable stream fish community assessment program using the NC Index of Biotic Integrity has focused on six major activities this year:

1. temporal variability in the NCIBI with sampling at 12 streams in April, June, and September or October;
2. spatial variability in the NCIBI with sampling at three sites within a short distance at two streams;
3. spatial and temporal variability with sampling one stream at two sites at within a short distance in April, June, August, and October;
4. reference site selection and monitoring at approximately 12 new sites;
5. monitoring known NPDES permitted effluent and urban impacted sites at seven sites; and
6. reviewing all metric criteria and revising as appropriate, river basin by river basin.

The Field Methods which the Biological Assessment Unit employs for assessing the integrity of the fish community can be accessed at http://esb.ehnr.state.nc.us/BAU.html An Adobe Acrobat (.pdf) version of the IBI methods can be also downloaded at this web site. Any questions regarding North Carolina's IBI methods can be directed to Bryn H. Tracy (919-733-6946 or bryn.tracy@ncmail.net)

Fish tissue surveys were conducted in the Roanoke, Cashie, lower Yadkin, and Lower Cape Fear river basins. This summer marked a shift for ESB from more random basinwide studies to targeted assessments designed to gather information on a specific or suspected fish contaminants in certain regions. Of the nine metals pollutants routinely measured in NC fish samples, only arsenic, cadmium, mercury, and selenium have been present at levels of concern in edible tissues. Current surveys will now include these metals as well as chlorinated pesticides.

A third set of king mackerel samples was submitted to ESB by the North Carolina Division of

Marine Fisheries for mercury analysis. Mercury was measured at levels equal to or above the NC limit in 25 of 62 (40.3%) of samples from two previous sample periods. Earlier samples submitted from the NCDMF show mercury concentrations exceeding the NC limit in king mackerel weighing around 6.5 kg or more and having a length of about 96 cm or more. Results from the third sample set have not been released.

ESB has received reports of 49 significant (affecting 25 fish or more) fish kills thus far in 1999. Many events were attributed to low flows and resulting low dissolved oxygen levels during this summer's drought.

Ecosystems Unit

Algal- Mark vander Borgh is revamping and cleaning our taxonomic databases and beginning to build our periphyton and diatom capabilities. Mark is away at an international diatom symposium this very week in Colorado. Elizabeth Fensin has been busy, as usual with a steady season of Pfiesteria samples. The addition of epifluorescence microscopy this spring has been a tremendous benefit in evaluating autotrophic vs. heterotrophic Pfiesteria populations. The VAST majority of samples processed this summer were dominated by autotrophic dinoflagellates, leading one to believe that dinos were not related in fish kills where they were observed. The addition of digital microphotographic capabilities has been a boon to the Unit allowing rapid transmittal of images for collaboration and the beginnings of a digital reference collection database. Elizabeth has also collaborated with the Division of Epidemiology on the biology and effects of bluegreen algal blooms for public desimination. Once completed, we'll have this on the webpage. Steve Kroeger finished up some legacy work from the days when Karen Lynch was with us and published an overview of State programs' use of algae as an environmental indicator. This paper is available through the download link at the EU web page- http://esb.ehnr.state.nc.us/EU.html.

Coalition Monitoring- Cathy Tyndall is putting the finishing touches on the fifth Memorandum of Agreement between DWQ and monitoring coalitions. This last coalition will place the entire Cape Fear River Basin under coalition monitoring along with the Lower Neuse River and the entire Yadkin River. These coalitions, comprised of NPDES permittees, waive normal upstream/downstream monitoring requirements in lieu of a more strategic monitoring program to complement DWQ monitoring. Where they are in place, coalition monitoring effectively doubles ambient monitoring data for the cost of one DWQ staffer/227 stations.

Ambient Monitoring- We are THIS CLOSE to having a functional ambient monitoring database up and available on the web for public consumption. This tool will have a variety of data viewing, graphing, query, and analysis tools available and will give us the capability to finally get that big picture view of water quality around the state. Norm Bedwell, Phil Bethea, and Niki Flint are putting the finishing touches on SWIMS (Surface Water Information Management System) as of this writing. Norm will be presenting a SWIMS Overview at this year's SWPBA meeting.

Larry Ausley has received his third nomination to the Board of Directors of the Society of Environmental Toxicology and Chemistry as a governmental representative of over 5,000 scientists

worldwide. Balloting of the membership is currently ongoing. Larry would be the first State government representative to hold this post in the history of the Society and would bring with him the task of promoting the benefits of SETAC for State scientists (Vote early! Vote often!)

AQUATIC TOXICOLOGY UNIT

The Division of Water Quality has slightly modified its new whole effluent toxicity (WET) enforcement policy to address concerns from EPA. The Director had approved a new enforcement response strategy in March that was effective in July. The primary feature of the new policy was to evaluate chronic whole effluent toxicity compliance over a three-month period. As in the past, facilities have the option of performing a pass/fail test during specified quarterly monitoring months. Previously, failing tests required follow-up testing on a monthly basis until passing results were obtained. Civil penalties would be assessed on a case-by-case basis. As of July 1, failing pass/fail tests or multi-concentration tests producing a ChV below the limit will required follow-up testing with multi-concentration tests, at least one during each of the two following months. Compliance would be evaluated based on the follow-up tests. Non-compliant facilities would receive a civil penalty for the three-month period. The modification has effectively separated the processes determining compliance and the application of civil penalties. As of September 1, ANY test indicating a failure to meet a limit is considered a noncompliance and would receive a NOV at minimum. The follow-up testing and averaging strategy will be used to determine whether a civil penalty will be applied. As stated previously, the objectives of the policy changes are to standardize enforcement responses to WET among the Division's seven regional offices and to outline a more aggressive response to repeat violations. The Unit held a workshop in August for the Division's regional office personnel who deal with whole effluent toxicity issues. Critical topics included sampling/split sampling, self-monitoring reporting requirements, the Division's enforcement strategy, and quality assurance/quality control issues. Thirty Division personnel attended the workshop, which received many positive comments. The Division of Water Quality's whole effluent toxicity (WET) procedures, WET report forms, guidance documents, and information on the new enforcement strategy are available at <http://esb.ehnr.state.nc.us/ATU.html>.

Lastly, the Unit bids a fond goodbye to Chuck Olson, who had been with the Unit for a little less than two years. Chuck has taken a position with a local microbrewery as an "apprentice brewer." Many thanks to Chuck for his good work and we wish him good luck and good brewing in his new endeavor.

North Carolina's Stream Restoration Program

Dave Penrose and Todd St. John are in the initial phase of putting together a technical guide for biological monitoring of stream restoration/mitigation projects. This guide is intended as a beginners manual for developers and their consultants on the finer points of working with streams and conducting biological monitoring surveys of streams being restored. The document will contain sections that describe the biological monitoring processes of selecting locations, collection methods and habitat classification, Rosgen stream classification, QA/QC programs and taxonomy. This

document also will include a section describing case studies in which biological monitoring programs have been used to determine the success (or failure) of restoration. NC's stream restoration program will require biological certification of laboratories conducting these investigations. Are other state agencies in Region IV conducting similar programs? Are SWBPA members familiar with case studies in which biological monitoring progams have been used to determine restoration success? Contact Dave Penrose at dave.penrose@ncmail.net

South Carolina News

Phycology Program

We have had another busy season in the phycology area engaged in a number of projects. The ambient monitoring network for chlorophyll was expanded from strictly freshwaters to include 30 sites in estuarine waters. The estuarine monitoring for chlorophyll will give us baseline data for a wide area of coastal waters for which little data has historically been available. With the addition of the estuarine sites and a few special study sites, we will be sampling 94 stations for chlorophyll once per month through October.

There has been the usual assortment of samples submitted for phytoplankton analyses due to algal blooms and fish kills. However, fewer of these investigations evidently have been conducted than usual. All of South Carolina experienced rather severe drought in the spring and summer of 1999, and the lack of rainfall may have actually diminished the number of fish kill events this year.

The *Pfiesteria* surveillance program is continuing with the same emphasis on potential hot spots for*Pfiesteria* activity having priority. Efforts have been concentrated particularly at locations where diseased or killed fish have been observed in estuarine waters. Lesioned fish (with no fish kills) are still being found in late summer in a portion of the Cooper River near Charleston. As has been the case, however, only background levels of *Pfiesteria*-like cells are being found.

Massive, nuisance blooms of freshwater algae in the Reedy River arm of Lake Greenwood, South Carolina unfortunately commanded attention beginning in late May 1999. The green, filamentous algae *Hydrodictyon reticulatum* and *Pithophora* sp. bloomed to such a degree as to despoil recreational and aesthetic enjoyment of the waterbody. The Department (SCDHEC) was already in a complex legal battle to prevent additional phosphorus loading to this part of Lake Greenwood. It was remarkable and somewhat shocking to see the potential worst case biological response to eutrophication realized in a major reservoir.

Nonpoint Source Program

We have eagerly added a new person to our little nonpoint source team. Natalie Constantino joined us in August. She comes from our District office in Aiken, and has a bachelors degree in Aquaculture, Fisheries and Wildlife Biology from Clemson University. She brings good experience and energy to our team, and she will be at SWPBA this year so everyone can meet her.

We still have four 319 BMP monitoring studies underway, and have started a new one on 12 Mile Creek in Pickens County, and preparing to start one Wilson Creek and 96 Creek in Greenwood County.

We also continue to assist our watershed managers in addressing individual watersheds listed on the 303(d) list, in an attempt to implement TMDL s for these watersheds to remove them from the list. We are concentrating on streams with biological impairments, Joe Napolitano is focusing solely on this.

Short-term water quality assessments addressing 303(d) List waters are underway in the Mountain Creek watershed in Greenville County and on Lake Sucession in Abbeville County. We have conducted several of these studies for the watershed managers, and expect to do more in the future.

We have investigated several NPS complaints and conducted biological assessments for enforcement purposes. We continue to assist SCDHEC District personnel Statewide in assessing NPS impacts and enforcement referrals.

We continue to address NPS impacts defined in our Watershed Water Quality Management Strategies for each basin, and a continued effort towards monitoring BMP effectiveness on small scale watersheds remains a priority for us as well.

For questions or more information on NPS projects, please contact Peyton Bruner Sasnett at 803-898-4397, or e-mail: sasnetpb@columb32.dhec.state.sc.us, Joe Napolitano at 803-898-4400, or e-mail napolijf@columb32.dhec.state.sc.us, or Natalie Constantino at 803-898-4096, or e-mail constanm@columb32.dhec.state.sc.us

Macroinvertebrate Program

Replicate macroinvertebrate sampling was conducted this year at four of 73 ambient sites in the Broad River Basin. In the future we plan to do replicates at 10 percent of our stations. Additionally, we have plans to conduct replicate sampling that involves mixing sampling crews. We recently hired another person to work in the Nonpoint Source area which gives us a total of six biologists in the Section who conduct macroinvertebrate studies (three nonpoint source, three ambient). Because of the varied sampling experience among the six of us with the multiple habitat sampling protocol (few months to 20 years), we also plan to do replicate sampling with different sampling crews.

One of the special studies that may be interesting involved a cement truck that discharged waste cement into a mountain stream. At a new bridge construction site on the Middle Saluda River near Jones Gap, a construction crewmember decided that a good place to put the waste cement (before it set-up in the truck) was along the side of the creek to help stabilize the bank next to the roadway. When the cement truck let it go, it filled in the eroded area quite nicely, but the excess spread into the river. The next day the reports started coming in, from patrons who live along the river, of dead trout and other fish.

The spill occurred on Friday afternoon and our district personnel were notified by the following Saturday. District personnel investigated and involved fisheries biologists from DNR to do the fish kill investigation. We got called to the scene on Monday to do a macroinvertebrate

assessment. The fisheries biologists reported that they had not seen much of any aquatic life in the river downstream of the spill.

Based on the field macroinvertebrate collection, there did appear to be toxic impact on downstream macroinvertebrates caused by the cement spill and/or sedimentation from the construction site itself (samples were not identified by SWPBA press time). Prior to the fish kill investigation, the construction site had no sediment control barriers, however, that has since been corrected. Suspected causes of the fish kill were: toxic additives in the cement (stabilizers), pH fluctuations, and physical damage to fish gills by cement fine particulates.

The verdict is in on the two unusual species of caddisflies that were mentioned in the last newsletter. They are indeed new to science. The larva of the *Ceraclea* species resembles *C. resurgens*, however the adult male is closer to *C. transversa.* Several good characters have been found to separate adult males and females of this new species from *C. transversa.* However, I have not been able to find characters to separate the larva of the new species from *C. resurgens.* The last instar larva is much smaller than *C. resurgens* but the head is spotted. I suspect that this new species has been misidentified as *C. resurgens* in the Southeast. I would be interested in receiving larvae identified as *C. resurgens* if you have some in your collections. The swamp dwelling *Rhyacophila* is also new to science. The larva keys to *R. lobifera* but, according to Dr. John Morse and Dr. Brian Armitage, the adult is unusual. I will be working with Dr. Morse on describing these two new species in the future.

WATER QUALITY MONITORING SECTION

In addition to normal water monitoring and toxicity testing activities, the WQM Section has become involved in, or initiated, several intensive water quality studies in recent months. Fecal coliform source identification and mitigation has become an issue due to 303 (d) listing and TMDL requirements, as well as failing septic tanks and concentrated waterfowl on public lakes. We are currently in the process of contracting a study to identify fecal coliform sources and conducting a study to evaluate constructed wetlands as an alternative treatment for failing septic systems. We have also begun a verification study to assess the predictive capabilities of our toxicity test methods due to the ongoing controversy over toxicity test variability and the State Toxics Control Strategy.

Identification and Mitigation of NPS Fecal Coliform Bacteria

Approximately 80% of the impaired waters listed on the State of South Carolina 303 (d) List for 1998, are listed because of fecal coliform bacteria standards violations. Also, all non-administrative coastal shellfish harvesting closures are due to fecal coliform bacteria standards violations. Crucial to any plan to achieve standards compliance is an understanding of the probable sources of the fecal coliform bacteria, e.g. human, domesticated animals, wild animals, etc. There are several tools that can aid in this process. One relatively simple and

inexpensive test is Multiple Antibiotic Resistance (MAR). By isolating *Escherichia coli* strains from positive fecal coliform results and exposing them to an array of antibiotics and measuring their growth, it is possible to begin to identify the original host of the bacteria. This can help focus corrective actions at the specific source of the problem: leaking septic tanks, wastewater discharges, livestock and animal operations, pet waste, wildlife populations, etc. Further discrimination between human and animal populations can be achieved using tests such as typing with ribosomal DNA (ribo-typing) isolated from the *E. coli* strains. Other, more highly specific methods, such as pulse-field gel electrophoresis (PFGE), are available for use as a secondary method when greater resolution is necessary to distinguish between wild and domestic animal populations.

Total Maximum Daily Loads (TMDLs) will be required in all 303 (d) listed waterbodies. Positive identification of fecal coliform sources is crucial in order for TMDL development and implementation to be effective. Once identified, sources of NPS fecal coliforms may be adequately mitigated through appropriate corrective action and removed from the 303(d) list of impaired water bodies. The Department has just issued (September 17, 1999) a Request for Proposal to assess the NPS contributions of fecal coliforms at 96 stream stations. An initial pilot study of 1 - 3 stations will be completed prior to assessment at the remaining stations.

Objectives

Objective 1 - MAR and ribo-typing of samples from each station and from a major municipal discharger in each watershed (as a human type reference) will be conducted. Results from this first phase of study will identify fecal coliforms as originating from human or animal sources and will be useful in confirmation of single sources in priority 2 and 3 waterbodies.
Objective 2 - PFGE analysis of a second set of samples collected from all stations designated as priority 1 waterbodies (12 stations), and one Bush River station (priority 2) will be conducted in the second phase of study. These sample stations are impacted by multiple sources and it is expected that higher resolution will be necessary to distinguish between animal and human populations as sources of fecal coliforms. Also, priority 2 and 3 stations where previous testing proves inconclusive, may be included in the second phase of testing for additional MAR testing, ribo-typing, and PFGE.

Constructed Wetlands as Alternative Treatment for Failing Septic Systems

A special study of water quality from constructed wetlands has been implemented (May 1, 1999, through April 30, 2000), in conjunction with a demonstration project by the South Carolina RC&D Council to assess the effectiveness of constructed wetlands as an alternative treatment for failing septic tank systems. A total of eight (8) failing septic tank systems have had existing tile fields replaced with constructed wetlands (12' x 14') and a drain field (12' x 14'), for the treatment of tank effluent.

Effluent will flow via gravity line to the wetland for treatment and then to the drain field where it

will percolate to groundwater. Water quality data from the influent to, and effluent from, the wetland will be evaluated to determine the effectiveness of constructed wetlands for waste water treatment. Depending on effluent quality, a groundwater monitoring well may be installed at one site to monitor for potential ground water contamination and to assess the need for additional wells. After one year of monthly monitoring, data will be assessed to determine if continued water quality monitoring is warranted.

Correlation of WET Test Results with Instream Macroinvertebrate Metrics

Results of toxicity tests conducted at facility design flow and receiving stream 7Q10 flow, or other specified concentration (i.e. hypothesis testing), represent specific conditions and are intended to indicate the presence or absence of toxicity at those concentrations. Therefore, a toxicity test failure is not necessarily indicative of instream impact. In order to predict instream impact at existing instream concentrations, it is necessary to conduct multiple regression analysis of multiconcentration test data. The Section has initiated a special study to investigate the correlation of instream macroinvertebrate metrics with the EC25, EC50, or other toxicity test endpoint.

A definitive toxicity test will be conducted on selected facility effluents using a logarithmic series of concentrations, with facility design flow and receiving stream 7Q10 flow as the highest concentration, and including the concentration at facility design flow and annual average stream flow. During the course of the toxicity test, a stream flow measurement and macroinvertebrate assessment will be made, so that actual instream impact can be correlated with effect predicted from multiple regression analysis. The study is expected to continue until a reasonable estimate of correlation can be made.

Probability Based Monitoring - Coastal Pilot Project

A statewide probability-based, or random sampling, component is being developed as an addition to the Ambient Surface Water Quality Monitoring Network. Probability-based water quality data can be used to make inferences, with known confidence, about the stream, lake, and estuarine resources of the State. Separate monitoring schemes are currently being developed for each of these three major waterbody types. Site selection is being done in association with the U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory (NHEERL), Corvallis, Oregon.

The coastal estuarine monitoring scheme is being developed jointly by SCDHEC, Bureau of Water, and the South Carolina Department of Natural Resources (SCDNR), Marine Resources Research Institute (MRRI). To insure inclusion of a variety of estuarine ecosystems and habitats, the coastal estuaries have been divided into two categories: Tidal Creeks (less than 100 m wide), and Open Water (greater than 100 m wide). Both categories will receive an equal number of monitoring sites in the probability-based scheme.

Monitoring of the probability-based coastal estuarine sites will be a cooperative venture between

SCDHEC and SCDNR-MRRI. There will be a group of Core Tidal Creek and Core Open Water sites that will be sampled jointly by SCDHEC and SCDNR-MRRI for one year. These will be sampled monthly by SCDHEC for water column parameters and annually for sediment chemistry, and annually by SCDNR-MRRI for sediment physical characteristics, sediment toxicity, benthic infauna, 24-48 hour hydrolab deployments, and fish trawls, with one additional water chemistry sample collected in conjunction with the biological samples to be analyzed by SCDHEC.

There will be an additional group of Supplemental Tidal Creek and Supplemental Open Water sites that will be sampled one time only by SCDNR-MRRI. These sites will be sampled for sediment chemistry, sediment physical characteristics, sediment toxicity, benthic infauna, 24-48 hour hydrolab deployments, and fish trawls, with one water chemistry sample collected in conjunction with the biological samples to be analyzed by SCDHEC.

A pilot project is being conducted to resolve coordination and logistical details including: sample site selection criteria, standardization of sample collection methods, sample preservation, sample transport, and data transfer issues. The pilot project consists of sampling approximately 15 Core Tidal Creek sites, 15 Core Open Water sites, 15 Supplemental Tidal Creek sites, and 15 Supplemental Open Water sites. The project timeline calls for monthly sampling by SCDHEC personnel in August, September, and October. SCDNR-MRRI sample collection efforts began in July and will continue until September.

Other Notes

Jim Glover, Harry Gaymon, Rick Renfrow, and David Chestnut have been working with Glenn Griffith and Jim Omernik of EPA's National Health and Environmental Effects Research Laboratory and interdisciplinary team on the Level Four EcoRegion delineations for South Carolina. The second meeting was held in July to review the draft map, and field verification is scheduled for the week of October 4.

On September 20th David Chestnut and Sally Knowles, Director of the Water Quality Division, gave a presentation on statewide water quality and SCDHEC water quality initiatives to the Governor's Interagency Council on Natural Resources Policy. The Council is made up of high level representatives from the Governor's Office, SCDHEC, Department of Natural Resources, Department of Agriculture, Department of Parks, Recreation, and Tourism, and the Forestry Commission. Non-voting representatives include the Secretary of Commerce, Department of Revenue, Department of Transportation, and one member each representing an environmental interest organization and science departments in public universities. The main purpose is to bring together the principal agencies involved in development and implementation of environmental policy at the State level to work on environmental policy issues in a coordinated, cooperative, comprehensive manner instead of a piecemeal, agency-by-agency approach. The Council will assist the Governor's Office in identifying major environmental issues and develop action plans to address these issues while ensuring collaboration of affected State agencies.

Dave Chestnut and Bill McDermott have been working to get new STORET up and running. They have been working with a team comprised of representatives from the Central Laboratory, data entry personnel, District representatives, and groundwater monitoring staff to set up the necessary background to allow data entry.

During the post Hurricane Floyd flooding the Governor's Office and the Emergency Preparedness Division called for the creation of a Hydrology Advisory Team to prepare a single daily estimate of time and magnitude of floodwater crests to be used in emergency planning and response activities. Dave Chestnut and Rob Devlin (Groundwater Management) were tasked to work as SCDHEC liaisons to the Team, which also included representatives of the SC Department of Natural Resources, USGS, Army Corps of Engineers, US Weather Service, FEMA, and the Emergency Preparedness Division.

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

The Nonpoint Source Program will be sponsoring the Tennessee Annual Nonpoint Source Partnership Conference at the World's Fairgrounds in Knoxville TN, on October 26-28, 1999. The main focus of this annual event is to bring water quality professionals together in an attempt to strengthen and broaden their abilities to successfully resolve nonpoint source water quality issues through the introduction of new/innovative techniques and the exchange of ideas/experiences with other water quality professionals. Two concurrent sessions have been planned. Mr. Eric Livingston, a leader in urban runoff and construction abatement in the U.S., will be giving two presentations. Mr. Livingston has been involved in Florida's effort since 1979. He will draw upon the great similarities between Florida in the early 1980s and Tennessee in the late 1990s. Other presentations will cover CAFOs, TMDLs, and 303(d) Listings. For more conference information, contact Gregory Upham, Manager of the Nonpoint Source Program at 615-837-5490.

TDEC - Water Pollution Control - Central Office

APPROVED TMDLs (Total Maximum Daily Loading)

Tennessee has just completed its FIRST approved TMDL for copper on Cane Creek from mile 17.9 to its confluence with the Hatchie River in Lauderdale County. This watershed is located in the Mississippi Valley Loess Plains (74) Ecoregion. The TMDL determines the allowable pollutant load that the water can assimilate, allocate that load among various point and nonpoint sources, include a margin of safety, and address seasonality. Cane Creek is listed on Tennessee's 1998 303(d) list as not supporting its designated use classifications due in part to discharge of metals from industrial point sources. This TMDL proposes a phased approach to reduce the copper loading from point sources. It requires an initial reduction of 56% of the copper loading and an eventual further reduction to reach a 79% total reduction in copper loading. This TMDL is the first of approximately 352 TMDLs to be completed over a 13-year period. (We believe in job security.) For more information on TMDLs, visit the TDEC web site: **www.state.tn.us/environment/wpc/tmdl.htm,** or contact Sherry Wang (615) 532-0656.

Fluvial Geomorphology

EPA grant funding was used to develop fluvial geomorphic regional curves for the rivers of western Tennessee. This project produced a report titled Western Tennessee Fluvial Geomorphic Regional Curves by Dr. Douglas P. Smith and Leslie Turrini-Smith. The report summarizes information about bankfull dimensions and planform characteristics of several relatively unmodified streams located in western Tennessee. Most of the data comes from the Hatchie and Wolf River watersheds. Five sites are in the Mississippi Valley Loess Plains (74) Ecoregion, and nine sites are in the Southeastern Plains (65) Ecoregion. Reference sites were considered during the site selection phase of this project. Fluvial geomorphic regional curves are very powerful tools for evaluating and predicting the physical impacts of channel modifications, flow alterations, and other watershed changes, as well as determining appropriate physical parameters for stream and associated wetland restorations. Regional curves for middle and east Tennessee are in the planning stages. For more information and a copy of the report, contact Leslie Turrini-Smith (615-532-0395)

TDH – Aquatic Biology Section

Within the next 30 days, the Aquatic Biology Section will have completed all identifications for six macroinvertebrate collections at approximately 70 ecoregion reference streams. The macroinvertebrates were identified to genus and entered into EDAS (Ecological Data Application System), which is an Access database created by Jeff White at Tetra Tech Inc. The three-year collection period (August 1996 - April 1999) consisted of three late Summer, and three late Spring (Low flow and High flow) collections. EDAS contains Tennessee's core metrics (in addition to other metrics), so we will be testing them on the whole data set. Debbie Arnwine (615-262-6327) is the resident expert on EDAS.

When our Ecoregion Project started in 1996, we based our collection methodology on the 1989 RBP Manual. We had one semi-quantitative sample from the most productive habitat -- riffle or bank (in non-riffle streams) -- and qualitative picks

in all other microhabitats. However, when Dr. Michael Barbour (Tetra Tech Inc.) analyzed our first year of data, only the semi-quantitative samples were used to develop Tennessee's core metrics. As a result, the following two years of collections only contained semi-quantitative samples. And by the 1997 Revision to RBPs, we essentially used the Single Habitat Approach. But, like any great group of biologists, the BEST* Tennesseans decided to do a mini-project during our last collection. We selected approximately 12 reference streams in 10 Level IV Ecoregions, and sampled them intensively using both the Single Habitat and the Multihabitat Approaches; a mini methods comparison to see what the data will tell us. So, stay tuned. We'll give you the results in the next millennium SWPBA Newsletter.

That's All Folks!

9/28/99