**Alabama Department of Environmental Management,
Environmental Indicators Section (EIS)**

2014 SWPBA Newsletter

ADEM Welcomes New Employees

We are pleased to announce the arrival of our new staff member, Lacey Genard, who joined ADEM's Environmental Indicators Section in late January 2014. Ms. Genard graduated with her master's degree and a 4.0 from the University of Tennessee at Chattanooga. She attended undergrad at Birmingham-Southern and graduated *magna cum laude* in May 2010. With her fisheries background, she hit the ground running, participating in the Biological Condition Gradient (BCG) workshop her first week on the job. Since then she has participated in all types of sampling. Ms. Genard has proved to be an asset, especially with our fish IBI sampling.

We also would like to welcome Cal Johnson to ADEM. After working eight years with Pat O'Neil and the Geological Survey of Alabama, his personal life moved him to north Alabama, within commuting distance of our Decatur Field Office. In January 2014 we were able to complete the logistics and paperwork, and he has been working for ADEM ever since. We are happy he chose to share his expertise with us.

Tim Wynn joined ADEM's Birmingham Field Office in May 2014. He received his doctorate in aquatic biology from the University of Alabama. Tim was able to participate in this year's aquatic macroinvertebrate bioassessments, and he is currently in the process of completing his training to become an ADEM macroinvertebrate taxonomist. He has also been actively involved in the BEHI sampling project, the BCG development, and various other up and coming projects. We are glad to have him on board.

Rivers and Reservoirs Monitoring Program (RRMP)

This year the focus was in the Southeast Alabama River Basins, including the Chattahoochee and the Perdido-Escambia. We also collected compliance samples in the Tombigbee and Mobile River Basins. All stations will be sampled April-October. Approximately 80 river, reservoir, or tributary embayment stations are being sampled by four field offices. The sampling is complete through August and much of the data is already available.

This also an exciting time for ADEM as we gear up to revise our monitoring strategy. After two cycles of the five-year rotation, we are looking to take a more statewide approach, covering watersheds in all of the basins every year. While we are in the infancy of this change, it looks like we will be able to do more assessments on a smaller watershed scale (12-digit HUC). This will also allow us to sample our reservoirs on a more frequent schedule, hopefully providing more data than ever before. Once the new strategy is completed and approved, it should be posted to the ADEM website in spring 2015.

For further information on the RRMP, contact Gina Curvin at (334) 260-2783 or gcurvin@adem.state.al.us.

Rivers and Streams Monitoring Program (RSMP)

Two hundred and five locations are being sampled statewide as part of ADEM's 2014 RSMP. Beginning in 2005, the sampling protocols of several programs were combined to achieve better efficiency within the division. Water quality sampling began in March and will be completed in October. The RSMP wadeable macroinvertebrate, fish community bioassessments, and periphyton assessments have been completed.

Current and historical water quality data are available for download at: http://www.adem.alabama.gov/programs/water/waterquality.cnt. ADEM's RSMP monitoring summary reports are organized by sampling year and county on ADEM's website: http://www.adem.alabama.gov/programs/water/wqsurvey.cnt.

The ADEM is also in the process of updating its Monitoring Strategy, which has been conducted on a 5-year basin rotation since 1996. Beginning in 2015, Rivers and Streams Monitoring will be conducted in all five basins every year. This will allow the program to respond more quickly to data needs in each basin and allow ADEM to coordinate monitoring with other sampling efforts more easily.

For further information on the RSMP, contact Lisa Huff at (334) 260-2752 or esh@adem.state.al.us.

Fish Community Bioassessments (IBI)

ADEM recently completed the 2014 Fish IBI sampling with a target station list focused in the Southeast Alabama river basins. Twenty locations were visited, and assessments were successfully completed at all twenty of these sites. This field season was a great opportunity for ADEM employees, old and new, to receive training on the GSA 30+2 method and to practice field identifications on the fishes of southeastern Alabama.

For further information on the Fish IBI program, contact Cal Johnson at 256-432-2162 or cal.johnson@adem.state.al. us or Ruthie Perez at (334) 260-2762 or ryperez@adem.state.al.us.

Bank Erosion Hazard Index (BEHI)

The ADEM has been working on developing siltation criteria this year with monitoring streams in the Tennessee River basin above the Fall Line and in the Choctawhatchee and Chattahoochee River basins below the Fall Line by measuring Bank Erosion Hazard Index (BEHI) and Near Bank Stress (NBS) as published by Rosgen (2001a). The BEHI and NBS are used to predict bank erosion in streams and incorporate a cross-sectional profile of the stream channel, a measurement of bankfull and floodplain locations, the installation of bank pins for monitoring bank erosion, and other factors including bank angle, vegetative protection, and root depth and density. The information collected from these measurements is to be used for developing a consistent method of monitoring streams in Alabama for impacts of sedimentation.

For further information on ADEM's BEHI project, contact Bonnie Coleman at (334) 260-2737 or bcoleman@adem.state.al.us.

Alabama's Biological Condition Gradient (BCG)

With tremendous help from EPA's Office of Water, Office of Science and Technology (OST) and Tetra Tech, the Alabama Department of Environmental Management (ADEM) and the Geological Survey of Alabama (GSA) hosted an expert panel discussion, *Calibrating the Biological Condition Gradient (BCG) to Alabama's Upland Streams and Rivers*, January 28-30, in Columbiana, Alabama. The discussion focused on fish and macroinvertebrate communities in Alabama's rivers and streams located above the fall line.

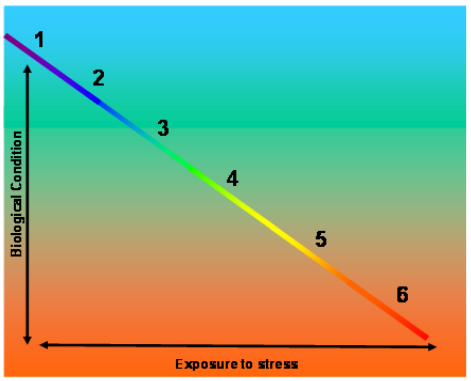
The BCG is a conceptual, narrative model that describes how biological attributes of aquatic ecosystems change along a gradient of increasing anthropogenic stress, developed by biologists from across the United States (Davies and Jackson 2006). It is divided into six levels of condition that can be readily discerned in many aquatic ecosystems of North America (Figure 1, Y-axis). It is based on ten attributes of aquatic ecosystems that change in response to increasing levels of stressors along the gradient, from level 1 to 6. The attributes include several aspects of community structure, organism condition, ecosystem function, spatial and temporal attributes of stream size, and connectivity. Each attribute provides information about the biological condition of a waterbody. Combined into a model, the attributes indicate specific waterbody conditions.

Over the course of the workshop and subsequent webinars, the expert panel used ADEM (macroinvertebrate) and GSA (fish) IBI data to define ecological attributes and to assign 100 to 120 macroinvertebrate and fish assessments to BCG levels. Through discussions of the samples, attributes, stressor-response mechanisms, and natural variability, the experts and facilitators developed narrative decision rules for assigning sites to BCG levels on the basis of the biological information collected at the sites. For each community, a quantitative decision model is being developed from the decision rules.

For further information on BCG, contact Lisa Huff at (334) 260-2752 or esh@adem.state.al.us.

Levels of Condition

1	Natural or native condition
2	Minimal changes in structure; minimal changes in function.
3	Evident changes in structure of the biotic community; minimal changes in ecosystem function.
4	Moderate changes in structure; ecosystem functions largely maintained.
5	Major changes in community structure; moderate changes in function
6	Extreme changes in both structure and ecosystem function.



Watershed, habitat, flow regime and water chemistry as naturally occur.

Chemistry, habitat, flow regime severely altered from natural conditions.

Fish Tissue Monitoring Program (FTMP)

Fish tissue data collected by the department during the fall of 2013 was used by the Alabama Department of Public Health to issue new consumption advisories for five waterbodies in the state. Those waterbodies include Bear Creek (Colbert County), Cypress Creek (Lauderdale County), Round Island Creek (Limestone County), Town Creek (Marshall County), and the Tennessee River in the vicinity of river mile 408 (Jackson County). All five new advisories were issued due to mercury levels in fish. Thirteen waterbodies with existing consumption advisories were updated with data collected during 2013. Waterbodies where advisories were updated include Bear Creek (Franklin County), two locations on Big Nance Creek (Lawrence County), Flint Creek (Morgan County), Limestone Creek (Limestone County) and Widows Creek (Jackson County) as well as the reservoirs on Bear Creek (Franklin County), Little Bear Creek (Franklin County), Upper Bear Creek (Marion County), and Cedar Creek (Franklin County). Existing consumption advisories were also updated for Little Escambia Creek (Escambia County), Claiborne Reservoir (Monroe and Clarke Counties), and the Alabama (Monroe County), and Blackwater Rivers (Escambia County). One consumption advisory was removed at Tennessee River mile 417 (Jackson County). Fish were also collected from Bakers Creek (Morgan County) and the Gulf of Mexico, where advisories currently exist. These samples were not associated with the current advisories on these waterbodies.

Locations that were sampled during 2013 where no contaminants were found at levels requiring consumption advisories include: Dannelly Reservoir (Dallas County), Bear Creek (Colbert County), Big Spring Creek (Marshal County), Cane Creek (Colbert County), Crow Creek (Jackson County), Dry Creek (Jackson County), Flint Creek (Morgan County), Indian Creek (Madison County), and the Elk River (Lauderdale County). Other sample locations not requiring consumption advisories include Mud Creek (Jackson County), North Sauty Creek (Jackson County), South Sauty Creek (Jackson County), Second Creek (Lauderdale County), Shoal Creek (Lauderdale County), Short Creek (Marshall County), Spring Creek (Colbert County), and Spring Creek (Lawrence County). Numerous locations sampled along the Tennessee River from Pickwick, Wilson, Wheeler, and Guntersville Reservoirs also required no consumption advisories.

The focus basins for the 2014 FTMP are the Chattahoochee, Choctawhatchee, and Pea River basins. Sampling for the 2014 FTMP is currently ongoing.

For further information on the FTMP, contact Michael Len at (334) 260-2787 or mlen@adem.state.al.us.