

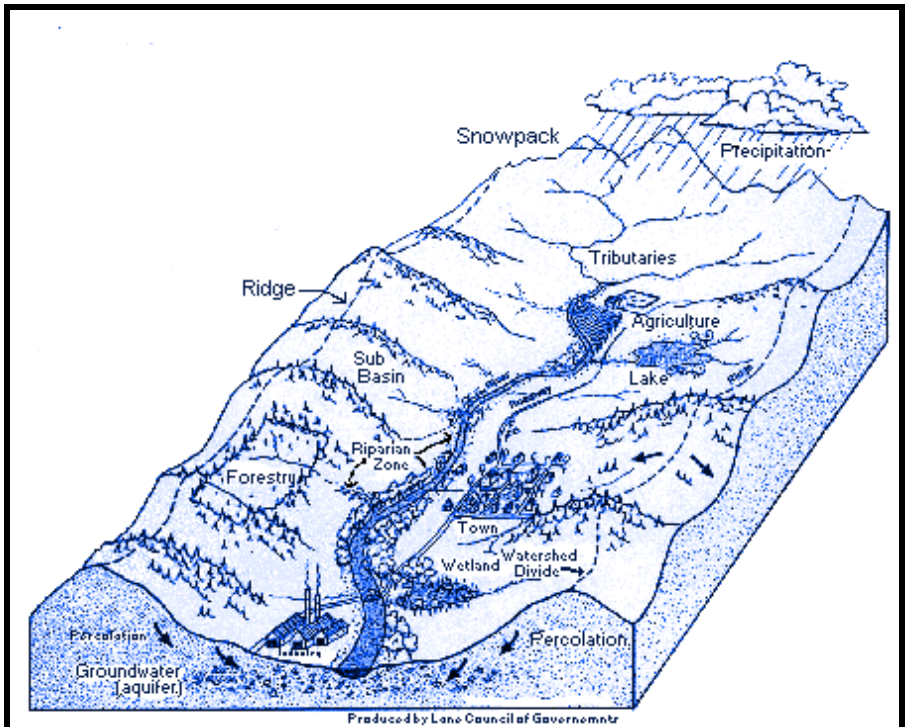
Watershed Assessment in Georgia

What is a watershed?

A watershed is a region in which all the rainfall coming from the land drains to a particular body of water or common point. If you look up hill from any given point, the watershed would encompass all the land above that point.

What is a Watershed Assessment?

Watershed assessment is the measurement and use of chemical, physical, and biological properties to determine the current health of streams. It also can include the use of predictive modeling of watershed conditions and suggests management practices that will maintain and improve the health of a watershed.



Why might my community need a watershed assessment?

Watershed assessments are a part of the National Pollutant Discharge Elimination System (NPDES) permitting process that wastewater treatment plants must comply with in order to operate. In short, they are required, by the State of Georgia, if a community wants to obtain a new NPDES permit or, in some cases, renew an existing permit for a wastewater treatment plant.

Besides being part of the NPDES permitting process, watershed assessments are important to communities because they identify non-point sources of pollution, predict impacts of growth and development on streams and rivers, and recommend management practices that will help manage watershed health in the face of development.

Components of a Watershed Assessment

Characterization

The first task in a watershed assessment is to characterize the watershed. This involves collecting chemical, physical, and biological information about the watershed to establish baseline conditions for the assessment.

Bioassessment



Bioassessments have three main parts: habitat assessment, benthic macroinvertebrate (aquatic insect) assessment, and fish assessment. The habitat assessment involves visual inspection of the stream itself, the banks, and the surrounding area. The aquatic insect assessment (pictured above) involves collecting insects from different habitats in the stream (banks, sand deposits, leaf packs, woody debris) and identifying them.



The fish assessment is similar to the aquatic insect assessment as the fish are collected and identified. Aquatic insects and fish can survive in waters with different levels of pollution. Presence of organisms sensitive to pollution generally indicate that a stream is healthy. A lack of pollution sensitive organisms may indicate that a stream is impaired.

The characterization process also includes collecting information on local population, weather and climate, agricultural operations, projected growth and development, and local environmental interest and expertise.

Watershed Delineation

After the sites for the bioassessment and water quality sampling are selected, the watersheds that contribute to that point are determined. Watersheds can be delineated manually using topographic maps or they can be delineated digitally.

Watershed delineation is an important step, because when land use within the watershed is determined, sources of potential non-point source pollution can be more easily identified.

Water Quality

Water quality information is collected several different ways. The first is obtaining existing information, usually from wastewater treatment plants or other environmental studies in the area. The second is collecting in-stream information with a portable water quality meter. The meter is capable of determining the amount of oxygen dissolved in the water, the clarity of the water, the pH of the water, and the temperature of the water. The third method involves collecting samples and taking them to a laboratory to be analyzed. The laboratory conducts tests including those that help determine if the water is contaminated by bacteria, what nutrients are in the water, and how much sediment is suspended in the water. The information gathered through water quality testing is important because most of Georgia's water laws are based on water quality standards.



Components of a Watershed Assessment

Modeling

Watershed computer models predict the effects of future developments on streams. They can also be used to run development scenarios with the corresponding management options. While modeling is not required for a watershed assessment, it can be used to develop management practices to protect the health of streams.

Models used in watershed assessments are computer programs that receive information about a particular watershed and process it with a number of equations. The output of watershed models are predictions of how streams in the watershed will respond to changes in land use, usually resulting from increased development. Being aware of potential increase of pollution in streams can help city and county officials plan for the future. Some models are also capable of testing management scenarios. This feature is a particularly helpful management tool as it would help planners determine the most effective and efficient management practices for particular problem areas. Fine tuning management practices saves cities and counties money by reducing or possibly eliminating trial and error.

Watershed Management

Watershed management is the final component of a watershed assessment. It involves the recommendation of management activities that must be incorporated into a watershed protection/management plan. Cities and counties must implement these plans in order to be in compliance with their wastewater treatment plant NPDES permit.

While modeling can be helpful for determining effective management alternatives, it is not required. The choice of management alternatives can also be made by making visual assessments of the watershed area to determine streams currently experiencing water quality problems due to land use practices. Management recommendations for future water quality problems can be made based on recommendations for current problems.

Ongoing Monitoring

Ongoing monitoring is an important part of watershed management. Continuing to monitor streams helps determine whether or not the management practices recommended and implemented are returning the desired results. It also helps local officials identify and correct new problems in a timely manner.

Ongoing monitoring includes seasonal water quality sampling, as well as sampling during significant rain events. Bioassessments are also part of ongoing monitoring. It is recommended that they are conducted every few years, since they are more involved studies.

Public Education and Involvement

Involving the public in watershed management activities is crucial to developing and implementing an effective watershed management plan. Often, citizens have ideas or have noticed problems in the area that city and county officials and watershed researchers have missed. Since all of us impact water quality, educating citizens on the importance of environmental stewardship will help keep watershed management issues alive in communities.

Contacts and More Information

UGA's Watershed Group:

The group consists of engineers and environmental scientists that specialize in watershed assessments, and biological assessments. They strive to provide quality environmental studies for cities and counties in Georgia. Contact Hillary Smith Tanner at 706/542-0256 or check out their website at <http://watershed.engr.uga.edu>.

Other Contacts

Your County Extension Agent

<http://extension.caes.uga.edu>

There are many private consulting firms that conduct watershed assessments. Your local RDC or the Georgia EPD (404/675-6233) should have contact information.

Your local Regional Development Center

Atlanta Regional Commission - www.atlreg.com
Coastal Georgia RDC - www.coastalgeorgiadc.org
Central Savannah River Area RDC - www.csradc.org
Coosa Valley RDC - www.cvrdc.org
Georgia Mountain RDC - www.gamtrdc.org
Middle Georgia RDC - www.mgrdc.org
Heart of Georgia Altamaha RDC - www.hogardc.org
North Georgia RDC - www.ngrdc.org
Northeast Georgia RDC - www.negrdc.org
South Georgia RDC - www.sgrdc.com
Chattahoochee-Flint RDC - www.cfrdc.org
McIntosh Trail RDC - www.mtrdc.org
Lower Chattahoochee RDC - www.lowerchattahoocheerdc.org
Middle Flint RDC - www.middleflintrdc.org
Southeast Georgia RDC - www.segardc.org
Southwest Georgia RDC - www.swgeorgia.org

Georgia Environmental Protection Division Planning for Domestic Wastewater Systems
www.ganet.org/dnr/environ/techguide_files/wpb/domestic.pdf

U.S. Environmental Protection Agency Office of Wetlands, Oceans and Watersheds
www.epa.gov/owow/

U.S. Environmental Protection Agency Surf Your Watershed
www.epa.gov/surf/

The Southern Region Water Quality Regional Coordination Project promotes regional collaboration, enhances delivery of successful programs and encourages multi-state efforts to protect and restore water resources. Effective approaches for watershed management, pollution prevention, and youth education are identified and shared among states. Ultimately, the project improves public access to the research, extension, and education resources available through the Land Grant University System in the Southern Region and nationwide. The project is funded by the USDA Cooperative State Research, Education, and Extension Service.



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The University of Georgia and Fort Valley State University, the U.S. Department of Agriculture and counties of the state cooperating. The Cooperative Extension Service, The University of Georgia, College of Agricultural and Environmental Sciences offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, sex or disability. An Equal Opportunity Employer/Affirmative Action Organization Committed to a Diverse Work Force. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, The University of Georgia College of Agricultural and Environmental Sciences and the U.S. Department of Agriculture cooperating. Gale A. Buchanan, Dean and Director.

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