

# **PROPOSAL FOR IMPLEMENTING A WATERSHED APPROACH TO PROTECTING WATER RESOURCES**

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The Watershed Approach is the management of resources by watershed boundaries, rather than by political or regulatory boundaries. Table 1 describes the general characteristics of this approach. On a simplistic level, the Watershed Approach provides a mechanism to focus resources on specific units (basins) rather than trying to work on all state waters at one time. This focusing of resources allows Florida to address more effectively the nonpoint source issues and adverse environmental impacts resulting from population growth and development, while continuing to address historical responsibilities via a more efficient use of resources. Rather than create a whole new program, this approach also helps to coordinate and integrate the activities of existing programs by bringing together all stakeholders in a basin in a collaborative process.

The real advantage of the Watershed Approach, however, is that it provides a structure which allows for the management of entire systems rather than of their separate parts. Through a more holistic approach, we are better able to ensure that individual activities do not create cumulative impacts.

## **What Is a Watershed?**

Broadly defined, a watershed is the drainage area for a waterbody system, within which all surface water drains to a common point. The term “watershed” generally describes a land area that is smaller than a river basin or subbasin but larger than a site.

The Watershed Approach can operate on many scales, from a single water body to an entire state, and any size land area can be selected for watershed assessment. Unfortunately, the size of the area that one person associates with the term may be larger or smaller than the area that another person has in mind. Before an environmental assessment at the watershed scale can begin, a consistent vision of the size of the area to be studied is essential. The size of the area chosen depends on the purpose of the assessment, the issues to be evaluated, and the area’s physical, biological, and social complexity. Not only does a watershed include surface water and ground water, it also includes air, land, and living communities—all of which influence and are influenced by cultural and natural activities and events in that watershed.

**Table 1: Characteristics of the Watershed Approach**

- Is place based and defined by hydrologic boundaries, rather than political or social boundaries.
- Through a common framework of hydrologic unit codes (HUCs), addresses water-resource issues at different geographic scales within a basin.
- Provides a five-year basin management cycle and a detailed schedule of activities to meet statutory and administrative requirements.
- Coordinates existing activities so that each basin's water resources are managed efficiently and cost-effectively, without duplicated effort.
- Focuses on resolving a basin's problems rather than on taking regulatory action.
- Establishes a collaborative, consensus-based process by which a basin's diverse stakeholders can identify shared goals, build a common vision, define and prioritize problems, target resources, and implement management actions.
- Obtains commitments from stakeholders to work on resolving the basin's problems and to take responsibility for specific management tasks.
- Gradually evolves from an informal, loosely organized group of participants in each basin to a more formal, centralized management structure.
- Brings together stakeholders in each basin in formal, organized partnerships.
- Creates a process through which political and organizational obstacles to resolving a basin's water-resource problems can be managed.
- Strengthens the use of scientific data as a factual basis for decision making.
- Uses an interdisciplinary approach to identify, prioritize, and solve problems.
- Sets specific, quantifiable goals for restoration and protection.
- Establishes a cooperative monitoring program so that progress towards those goals can be measured.
- Uses monitoring to evaluate the effectiveness of management actions and incorporates the results into the next basin management cycle.
- Emphasizes transfer of information to the public and other governmental agencies to achieve management goals.

## **Goals of the Watershed Approach**

The Watershed Management Program (WMP) in the Division of Water Resource Management, Florida Department of Environmental Protection (DEP), chose the Watershed Approach to help achieve three primary goals: 303(d) listing of impaired waters (under Section 303[d] of the Clean Water Act) and total maximum daily load (TMDL) development, 305(b) reporting on statewide water quality (under Section 305[b] of the Clean Water Act), and implementing Florida's Source Water Assessment and Protection (SWAP) Program.

The WMP, which will take the lead in implementing the Watershed Approach, is currently developing the implementation details for Florida. The WMP coordinates a variety of programs to protect and preserve surface water and ground water. It establishes water-quality standards and classifications, coordinates ambient monitoring of state waters, delineates areas of known ground water contamination, protects potable water supplies through source water assessments,

prepares reports on ambient water quality, identifies impaired surface waters, and performs water-quality assessments designed to identify the maximum amounts of pollutants that state waters can assimilate without exceeding applicable water-quality criteria.

While the Watershed Approach will initially be implemented with Division of Water Resource Management programs, it is designed to complement other watershed management programs in the state, including DEP's Ecosystem Management Program, the water management districts' Surface Water Improvement and Management (SWIM) Program, and the National Estuary Program (NEP). These programs have made significant progress towards addressing water-quality issues on a basin scale in Florida. The Watershed Approach is not meant to replace these and other activities but rather to coordinate with them and to provide mutual assistance when possible.

The Watershed Approach can eventually serve as a basis for achieving broader, ecosystem-level objectives. To truly achieve the potential of this approach, however, a wide range of stakeholders will need to embrace the elements and the process described here. Our hope is that the Watershed Approach will eventually encompass all DEP's divisions and a broad range of participants on each basin management team, including all levels of government, business and industry, academia, environmental organizations, and private citizens. These stakeholders are the individuals—each with their own agendas and concerns—who are crucial to developing consensus-based solutions to a basin's problems.

## **Benefits of the Watershed Approach**

The Watershed Approach will speed the implementation of management actions, since participants understand that a plan or policy reflects their input and has been crafted to meet their interests. At a time when fewer federal, state, and local dollars are available to deal with critical issues, it will focus a wider array of resources on an individual basin's problems. It will encourage intergovernmental cooperation, since different governmental units and nongovernmental interests work to build cooperative agreements on issues that cut across jurisdictional lines.

The Watershed Approach will also be a tool to educate participants on the complex nature of problems and issues in a basin and the range of concerns that must be addressed. Finally, because the approach allows the development of solutions that address the interests and concerns of all stakeholders, those solutions will be more effectively implemented over the long term.

## **Components of the Watershed Approach**

The Watershed Approach has five major components, as follows:

### **Basin Management Unit**

The basin management unit is the geographic or spatial unit used to divide the state into smaller areas for assessment. The basin management unit used in this document generally corresponds with Florida's Ecosystem Management Areas (EMAs). The lone exception is the Suwannee

River Basin, which consists of two EMAs. The state’s EMAs are in turn subdivided into major river basins, which the U.S. Geological Survey (USGS) has cataloged as eight-digit hydrologic unit codes (HUCs). HUCs are a cataloging system commonly used for watershed assessment and management. They provide a common national framework for delineating and cataloging watersheds and their boundaries at a number of different geographic scales.

**Basin Management Cycle**

The basin management cycle, the centerpiece of the Watershed Approach, is the five-year cycle within which watersheds are assessed and management plans implemented. The cycle will be carried out in a particular sequence, based on the state’s resources and the degree of water-quality impairment in individual basins. It will run concurrently in Florida’s six DEP districts. A new basin will be started each year while activities continue in current basins.

Each individual basin assessment will take five years to complete, and in year six the cycle for that basin will start over. Thus the cycle is an iterative process, with additional progress being made in each future cycle to address each basin’s problems.

The basin management cycle has the following five phases:

<b>Phase 1</b>	<b>Preliminary Basin Assessment</b>
<b>Phase 2</b>	<b>Strategic Monitoring</b>
<b>Phase 3</b>	<b>Data Analysis and TMDL Development</b>
<b>Phase 4</b>	<b>Management Action Plan</b>
<b>Phase 5</b>	<b>Implementation</b>

Each phase has its own unique products and results. Updated in each subsequent reiteration of the cycle, these document the basin’s most urgent problems and help participants plan to address them.

**Phase 1: Preliminary Basin Assessment.** The preliminary basin assessment determines the general ecological health of the basin and its individual water bodies; identifies water bodies that may require protection, restoration, and/or TMDL development; identifies water bodies where further study is needed because of water-quality problems or a lack of data; identifies sources of pollution; and proposes management goals and objectives. It will also be used to refine the state’s 303(d) list of impaired waters, prioritize which waters will be studied during the basin management cycle, and develop a verified list for regulatory action. Delisting may be proposed for some waters. During Phase 1, it will be essential to develop outreach mechanisms to identify and coordinate with the major local, regional, state, and federal stakeholders (both public and private).

This phase results in the production of a Status Report. To jump-start the process of developing the report, the basin management team first assesses in detail what is currently known about the basin’s physical, chemical, biological, and cultural features. The initial assessment provides participants with a common factual basis for measuring future changes, identifying information gaps and major issues, and determining future strategies and actions to preserve, protect, or restore the basin. Understanding the physical framework of each basin is especially important,

because geologic structures and surface features affect both how and where water enters the system locally and regionally, and how point and nonpoint pollution travel through the aquifers. Once this information is known, the basin management team can develop a more accurate picture of the areas that are most contaminated or most vulnerable to contamination.

Once the initial assessment is completed, participants identify management goals and objectives, and prioritize resource issues of concern in the basin. Next, the basin management team inventories existing and proposed management activities.

A detailed Plan of Study is then developed to address information gaps in the basin. It also prioritizes programmatic, legal and regulatory, management, and monitoring needs, targets resources, and, most important, evaluates how monitoring and management activities can be coordinated among the many agencies involved. The Plan of Study will include a Strategic Monitoring Plan that describes acceptable processes and methods for collecting data, provides details on who will carry out the monitoring and how the monitoring will be coordinated among different agencies, provides a schedule for completion, and identifies specific monitoring activities.

***Phase 2: Strategic Monitoring.*** Additional data are gathered based on the Plan of Study, in a coordinated effort with DEP district offices, local programs, and other agencies. Monitoring may focus on further characterizing conditions in the basin, investigating areas with identified or potential water-resource issues, evaluating the effectiveness of management actions, or collecting data for TMDL development.

DEP's Integrated Water Resources Monitoring Program (IWRM) will be an important tool for implementing strategic monitoring. This network will use a three-tiered approach to statewide monitoring, along with a Temporal Variability Network. This approach integrates ground water and surface water monitoring on a statewide basis. Information from Tier I (Status Network) will be used to make statistically significant statements on water quality for the entire state. Tier II (Assessment Network) monitoring will identify specific water-resource problems and determine the extent and severity of the problems. Tier III (Compliance Monitoring Network) monitoring, which will ensure that permitted facilities are in compliance with their permits, will provide a basis for evaluating the effectiveness of management options. The Temporal Variability Network for surface water will provide loading information for estuaries and the state, and measure seasonal variations. A network for ground water is under development.

***Phase 3: Data Analysis and TMDL Development.*** After evaluating and interpreting the data collected in the previous phase, participants define assimilative capacity for particular water bodies or watersheds and refine the list of smaller priority watersheds. A formula for allocating TMDLs is developed using modeling techniques that explain the relationship between pollutant loadings and surface water quality. As required by the Clean Water Act, these models incorporate conservative assumptions. Additional data collection needs are also identified.

***Phase 4: Management Action Plan.*** The final Management Action Plan (MAP), the culmination of the entire basin management cycle, evolves out of the first three phases. It focuses the work effort and documents how decisions are made and solutions selected. It also

identifies specific management tasks and projects, who is going to do the work, and how the work will be funded. This phase requires extensive stakeholder involvement and commitment.

The formal process of implementing the MAP is initiated by determining the necessary monitoring and management partnerships that must be created. It is important to identify funding opportunities, as well as volunteer programs that can continue to monitor water quality. Needed rule changes and legislative action should also be identified.

The documents created in earlier phases become chapters in the MAP. As part of the MAP, participants formally endorse the action plan and commit to implementing specific management actions.

***Phase 5: Implementation.*** In Phase 5, participants implement the MAP. Implementation can include any activity that enhances water-quality protection, such as voluntary best management practices for agriculture and stormwater, public education, habitat protection and restoration, issuance of National Pollutant Discharge Elimination (NPDES) permits, and TMDL allocations. Obtaining funding is an essential part of this phase., as is initiating rule development and/or legislative action. Participants also work to transfer the information gained during the cycle to the public and governmental agencies outside the WMP, and to educate the public on how to protect and preserve water resources.

As the cycle concludes, participants on the basin management team gear up to begin the next five-year cycle. To ensure that scarce resources are used cost-effectively, it is crucial that future cycles evaluate the effects of different management activities, determine how well they are working, and fine-tune the approach. To measure results, a Monitoring and Evaluation Plan is developed for use in the next cycle.

### **Basin Management Schedule**

The statewide basin management schedule establishes the proposed sequence for assessing individual watersheds. Priorities for carrying out the statewide schedule can be established by looking at existing areas where different agencies agree that problems exist and management actions need to be taken. The schedule can be determined based on the overlap of existing local, regional, state, or federal planning areas and priorities.

We have proposed dividing each of the state's six DEP districts into four approximately equal parts. In some basin management units where the workload is especially large and complex, completing the preliminary basin assessment could take as long as two years. Other units share resources, such as portions of their ground water supply, yet have quite different resource issues, governments, and approaches to resolving problems. In such cases, the management cycle for the two basins will begin in the same year, but separate documents will be generated, one for each basin. Portions of each basin's documents, however, will focus on coordinated regional monitoring and management actions. In many other cases where county lines cross hydrologic boundaries, it will be important to provide the appropriate level of coordination.

## **Forums and Communications Networks**

The Watershed Approach is effective only if stakeholders are involved in making the decisions that affect their basins. Forums and communications networks allow all stakeholders at all levels to collect and evaluate information on their individual basins, reach a consensus on the basin's current condition, identify problems, establish priorities, come up with solutions, and pool and focus their resources to implement management activities.

**Public Participation.** Because the broader management goals required by the Watershed Approach often fall beyond the statutory authority of the Division of Water Facilities, or even DEP (or any single agency adopting such an approach), these goals can only be fully achieved through active participation by stakeholders in individual basins, including citizens. The Watershed Approach provides multiple opportunities for public participation throughout the management cycle. Not only will members of the public participate on the basin management team, but there will also be numerous opportunities for public review and comment in forums and workshops held throughout the basin management cycle.

DEP has already made dramatic inroads to citizen participation through its Ecosystem Management Program. The program is active in site-specific ecosystem management projects, land stewardship, and restoration planning, and represents the agency in a wide variety of environmental forums. Ecosystem Managers are active in DEP's six DEP District Offices and serve as local coordinators for ecosystem issues.

## **Management Action Plan**

The Management Action Plan (MAP), the final chapter in the basin assessment process, effectively connects land and water-resource planning. The MAP is a sequence of documents developed over the five-year cycle and subsequently updated every five years. Evolving out of the previous phases, it documents the watershed's most urgent problems and how participants plan to address them. It also identifies specific management tasks and projects, who is going to do the work, and how the work will be funded.

## **Implementing the Watershed Approach**

As Figure 1 illustrates, the basin management cycle is an integrated, comprehensive process that is grounded in the basin's physical structure. The figure illustrates the fluid nature of the various elements as the cycle evolves. Each basin management cycle connects and coordinates a series of phased activities among stakeholders. Built into the cycle are mechanisms for obtaining feedback and fine-tuning management activities, based on the information that is collected.

While the process begins informally, a more formal structure for organizing a series of seemingly chaotic activities soon emerges. Participants' roles and responsibilities change throughout the cycle. For the most part, these will not be new roles and responsibilities, but rather a better coordination of existing activities. Eventually what develops is a tool for empowering decision making by all participants all the way down to the local level.

**Figure 1: The Basin Management Cycle**

