

**A REVIEW OF  
STATEWIDE WATERSHED MANAGEMENT APPROACHES**

**FINAL REPORT**

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**U. S. ENVIRONMENTAL PROTECTION AGENCY**

**OFFICE OF WATER**

## **ABBREVIATIONS**

CWA	Clean Water Act
GPRA	Government Performance and Results Act
NEP	National Estuary Program
NPDES	National Permits Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resource Conservation Services (USDA)
OWM	Office of Wastewater Management (EPA)
OWOW	Office of Wetlands, Oceans, and Watersheds (EPA)
SDWA	Safe Drinking Water Act
SRF	State Revolving Fund
SWAPP	Source Water Assessment and Protection Plans
TMDL	Total Maximum Daily Loads
WQS	Water Quality Standards
USFWS	U.S. Fish and Wildlife Services (DOI)
USGS	United States Geological Survey (DOI)
WRAS	Watershed Restoration Action Strategy
UWA	Unified Watershed Assessment

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## **A Review of Statewide Watershed Management Approaches**

### *Executive Summary*

#### **I. Background**

Over the past decade, more than 20 states have adopted a statewide watershed approach in the management of their water programs. A statewide watershed approach consists of five key components: (1) the delineation of a state into natural geographic (e.g., watershed/basin) management areas; (2) a series of management steps or phases to guide regulatory and non-regulatory actions within geographic areas (i.e., monitoring, assessment, planning, implementation); (3) the integration of CWA and other water resource programs through the coordinated implementation of management steps and the formation of partnerships; (4) a process for involving stakeholders; and (5) a focus on environmental results. During the past ten years, EPA headquarters and regional offices have undertaken numerous efforts to promote state efforts to adopt watershed management approaches by providing technical assistance, publishing communication and outreach materials, and offering facilitation and training. This past year, EPA's Office of Wastewater Management (OWM) and the Office of Wetlands, Oceans, and Watersheds (OWOW) jointly conducted a review of selected state experiences in adopting and implementing statewide watershed management approaches. This document contains a summary of the results of that review.

The objectives of the review were threefold: (1) identify and describe the different models of statewide watershed management; (2) characterize and assess the experiences of selected states using different models for statewide watershed management; and, (3) develop recommendations to improve EPA's support and states' implementation of statewide watershed management. The review consisted of both a thorough analysis of selected EPA and state program documents and outside reports, and structured telephone and in-person discussion sessions with managers and staff in selected states, EPA Regions, and state watershed organizations. The study assessed the watershed experiences of the following states: **Kentucky, Massachusetts, New Jersey, North Carolina, Ohio, Oregon, Texas, and Washington**. These states were selected based on whether they had adopted a statewide watershed management approach, had at least 2 years of experience implementing the approach, and represented a range of geography and types of watershed management approaches.

This summary includes three sections: (1) key findings across all eight states on program management, coordination across programs and state agencies, and state-local coordination and public involvement; (2) findings on the experiences of each core water program area with the statewide watershed management approach; and (3) conclusions and recommendations.

## II. State Watershed Management Experiences

*Models of statewide watershed management.* Statewide watershed approaches among the eight states under review are unique in their genesis and subsequent development. Watershed approaches have been spawned or significantly supported by leadership from the governor's office, state legislatures, the state environmental secretary, and the state water resource agency. The review found that there are two basic models of statewide watershed management: (1) six states adopted a state-sponsored basin planning/management approach (KY, MA, NJ, NC, OH, TX); and (2) two states adopted a local watershed/government-driven planning approach (OR, WA). Both of these models may include a range of approaches such as a process for rotating management activities (e.g., monitoring, planning, permitting) around state river basins over a 5-year period and/or significant stakeholder involvement processes managed by statewide committees, basin coordinators, or watershed teams. The trend in state watershed management appears to be toward a more localized, partnership-based approach driven by multi-stakeholder teams.

*Program Management Benefits.* States noted that although considerable effort is required to develop and initially implement a watershed approach, most said that overall agency efficiency improved after the approaches were operational. Most state managers were generally positive about their state's experience and identified a number of benefits resulting from the approach: (1) an increase in the quality and quantity of monitoring data; (2) better focused water quality assessments and planning; (3) more efficient and equitable permitting programs; (4) improved coordination and integration of state water program functions and goals; and (5) greater public involvement in state water quality program decision-making.

*State-Level Program Management Barriers.* States identified the following program management barriers within their states to implementing statewide watershed management approaches: (1) Tensions exist between programmatic requirements and statewide watershed management activities. Keeping program managers on board with the watershed approach - managers of the traditional "stovepipe" Clean Water Act programs (e.g., monitoring, TMDL, permitting, non-point source controls, etc) that have other duties - is an ongoing challenge since their programmatic obligations often limit their involvement in watershed activities. (2) States that have point sources grouped unevenly around the state often find it difficult if not infeasible to synchronize the issuing of NPDES permits. In addition, managing by basins can be complicated by special monitoring efforts sometimes needed to address citizen complaints or gather more data for TMDL development. (3) States lack adequate resources to hire basin coordinators, conduct basin-wide assessments, provide public outreach and adult education programs pertaining to water quality. (4) Despite the enormous investments some states have made in the watershed approach, they still feel vulnerable to changes in senior level commitment to the approach.

*EPA Program Management Barriers.* States identified a number of barriers posed by EPA and federal authorities to implementing statewide watershed management: (1) EPA's oversight of state

programs appears fragmented and output-oriented rather than integrated and driven by environmental results. Although EPA policies push for environmental “progress” and long-term management, states argue that the agency’s policies and state oversight are too often focused on short-term priorities. (2) Some states thought that the goals and timelines for reducing the permit backlog needed to be revised or made more flexible to fit their basin implementation schedules or to allow them to deal with their backlog on a basin-by-basin approach. (3) Some states are struggling to integrate TMDL development into their statewide watershed management approaches. Some thought that current EPA policy was too rigid and does not allow states to be innovative with watershed management. States identified problems such as tight schedules and limited resources for TMDL development, over emphasis on individual stream reach and single parameter assessments over comprehensive multi-parameter watershed assessments (e.g., pollutants vs. all stressors to a waterbody), and too much focus on restoration over protection. (4) Initiatives, like the Unified Watershed Assessment, result in numerous inefficiencies and redundancies that often distract staff, re-direct resources, and confuse watershed partners. (5) Several states thought that more visible EPA involvement in basin/watershed planning would enhance states’ watershed efforts and allow EPA to better understand local issues. (6) Schedule requirements under the Clean Water Act - e.g., the 5-year permitting re-issuance cycle, 3-year water quality standards review, 2-year 305(b) reporting and 303(d) listing - mitigate against synchronizing management actions on a 5-year rotating basin schedule.

*Coordination Across Programs and State Agencies.* Water quality and land use management authorities are splintered across numerous state commissions, departments, and agencies that have different mandates, priorities and techniques for managing programs and interacting with local authorities and the public. Most states felt that their statewide watershed management approach had improved interagency coordination but it was not as successful as it could be or needs to be. The challenge facing many state water programs is to convince other agencies to not only participate in the watershed process, but to agree to common water quality goals and work to achieve them.

States identified a number of key elements that have resulted in effective integrated and cooperative watershed management approaches: (1) a firm commitment and clear direction from top agency managers; (2) significant investments in coordination, power-sharing, and on-going communication among state and federal partners; (3) tightly focused organizational frameworks that include statewide steering committees, dedicated basin coordinators, and multi-stakeholder basin teams; and (4) basin plans that include clear responsibilities and a mechanism for tracking commitments and holding state managers accountable for achieving management goals.

*State-Local Coordination and Public Involvement.* Most state watershed programs have devoted significant resources to efforts to involve external stakeholders and private citizens in their activities. Although some states report significant increases in public input and involvement, other states maintain that public involvement has been relatively limited. States that have seen an increase in public interest and involvement admit to being somewhat taxed in dealing with it and report that they were not prepared for the amount of time and resources needed to effectively engage and respond to public

concerns, advice, or information. Nevertheless, states often describe their most notable successes as occurring in watersheds with strong stakeholder groups supported by state and other resources. While it is difficult for states to share agenda-setting and priority-establishing powers (and associated funding) with local entities, such an approach enhances the prospect for local buy-in, support, and action. The challenge for states has been to provide enough flexibility and support to local organizations to ensure their active engagement while maintaining the ability to focus local actions on attainment of state water quality standards.

Despite greater public involvement and input, statewide watershed management programs in most of the eight states have yet to build significant linkages to local government planning, zoning, or land use and management structures and their inherent authorities. Many state staff interviewed noted the importance of linking water quality impacts with local land use/management practices, but admitted that state-sponsored basin planning processes have not been as effective in the past as they could have been in helping link the two operationally.

### **III. Core Water Programs' Experiences with Statewide Watershed Management**

State monitoring and permitting programs are most involved and have received the greatest benefit from statewide watershed management approaches. States cited the following benefits and barriers for each water program area:

- *Monitoring and 305(b) reporting.* All states reported that statewide watershed management has resulted in dramatic improvements in both the quantity and quality of data. Despite these gains, states reported several concerns about basin-wide monitoring approaches: (1) The lack of data compatibility and uniform quality standards impact states' ability to conduct comprehensive watershed or basin assessments. More work is needed to build and manage databases across agencies that have standardized protocols, metadata reports, and geo-referencing capabilities for mapping and modeling. (2) Although most states noted a significant increase in the number of volunteer monitoring groups, some states are concerned about the quality and usefulness of some state and volunteer monitoring data and the effect it has on public expectations. (3) Clean Water Act requirements to report on the quality of state waters every two years do not coincide with some states' five year state watershed management cycle. Some states managers expressed interest in a five-year reporting cycle for 305(b) or focusing on selected basins per year that could help synchronize required reporting.

- *Water quality standards development.* The water quality standards development process is not significantly involved in any of the states' watershed management approaches but is still developed on a statewide basis. The primary reasons cited for this were: (1) the CWA triennial review requirement conflicts with the five-year basin cycle; (2) the development of water quality standards is a formal and frequently cumbersome rule or law-making process whereas basin assessment and planning are often based on informal or ad hoc procedures. Several states indicated, however, that the statewide watershed approach has indirectly benefitted the water quality standards process by improving the level

of communication about the standards and classification process among state partners, increasing public understanding of how standards are written and reclassifications are made, and enhancing the state's ability to assess the need for standards revisions. Finally, many states are interested but cautious about using a basin management approach to developing basin or watershed-specific standards. Some states are already developing criteria/standards by eco-region. Although better assessments and TMDLs appear to be driving the need for more basin-specific criteria and standards, states fear that it may require more state and EPA staff and resources to develop and review the likely increase in state submissions to EPA.

- *Total Maximum Daily Loads (TMDLs)*. Most states acknowledge that TMDLs have begun to drive their water programs but some are ambivalent about fully incorporating TMDL requirements into their watershed management approaches. Recent state experiences, however, indicate that TMDL development and statewide watershed approaches can provide mutual benefits. States that fully incorporate TMDLs into their watershed approach tend to be better focused and more attentive to measurable outcomes than those that do not, and TMDLs can be an efficient way to address multiple programmatic issues and responsibilities across state agencies. On the other hand, some states deal with TMDLs separately for a variety of reasons - varying and asynchronous schedules, scale dichotomies (i.e., TMDLs = narrow, small scale; watershed management = broad, landscape scale), and disparate foci (TMDLs = focus on WQS violations; watershed management = multiple stressors/sources). Even for states that don't integrate TMDLs into their statewide watershed management approach have found that key elements of the approach - interagency collaboration, stakeholder involvement, intensive monitoring and assessment efforts - can provide benefits and set the stage for more effective TMDL programs. The basin planning and assessment process can provide valuable information on the nature and sources of impairments, lay groundwork for more accurate pollutant load allocation and modeling, and provide an established stakeholder involvement process to build public awareness of TMDL development and plans.

- *NPDES permitting*. Almost all of the states under review have NPDES permitting programs that are involved in statewide watershed management. On the one hand, states maintained that basin-wide NPDES permitting can result in a more strategic and efficient permitting program, greater stakeholder involvement, and more effective and equitable permit limits. On the other hand, many states have struggled with issuing all NPDES permits within specific basins according to a 5 year rotating basin schedule. Key barriers include: (1) uneven permitting workload across basins; (2) special federal initiatives and new programs divert resources from basin permitting cycle (e.g., EPA permit backlog strategy, Great Lakes Initiative, stormwater regulations); (3) EPA and court-imposed TMDL schedules and review process that impact permit reissuance cycles; and, (4) pressure from the regulated community to address permitting issues when needed. State managers have adopted several approaches - such as prioritizing permit re-issuance and/or adjusting permit terms - to help their programs stay on a rotating basin management schedule.

- *Non-point source control/management* . Although state nonpoint source programs are frequently

used as a source of local watershed restoration funding, they are often not fully integrated into statewide watershed management approaches. Several reasons for this are the (1) historically “point source bias” of the statewide approach and the (2) limited coordination between state-sponsored basin management and locally-driven watershed planning. Some managers complained that the structure of the Section 319 program is not always amenable to statewide watershed assessment, planning, and management initiatives. For example, they argued that the formula for 319 fund use (i.e., 20 percent for planning/development, 80 percent for implementation) restricts some activities needed to address polluted runoff issues in the states. Even when state nonpoint source programs are closely tied to a statewide watershed approach primarily they tend to be drawn into the sphere of TMDL activities where waterbodies are listed due to polluted runoff.

- *Drinking Water*. State drinking water programs are only marginally involved in state watershed assessment, planning, and management programs. States cited several administrative and programmatic reasons for the disconnect: (1) U.S. EPA and state environmental agencies place water resource and watershed management programs in different divisions from their drinking water programs; (2) SDWA focuses on maximum contaminant levels in potable water and the CWA focuses on water quality standards for raw water which results in the use of two completely different (though arguably related) standard setting approaches; (3) the two programs traditionally have not shared the same concerns for the same stressors (e.g., phosphorus, sediment, bacteria, hydromodification); and (4) state drinking water managers perceived that SDWA programs were more focused on protection, whereas CWA programs that are becoming more TMDL-driven were more narrowly focused on remediation. Despite these barriers, nearly all state SDWA and CWA managers agreed that the SDWA source water assessment requirements represent significant opportunities for integrating clean water and safe drinking water programs.

#### **IV. Conclusions and Recommendations**

##### Conclusions

- State managers and staff are generally positive about their statewide watershed management approaches despite a number of programmatic and institutional barriers. Most believe the approach results in significant improvements in interagency coordination, enhanced public involvement, and better CWA program management (e.g., better data, improved capability for developing TMDLs, and more efficient and equitable NPDES permitting).
- Each state has adopted a slightly different variation of statewide watershed management to fit its needs and circumstances. States with the full range of watershed management components (statewide steering committee, basin coordinators, basin teams, basin plans) appear to be more successful in integrating water program responsibilities and requirements on a watershed level.
- Many states that have adopted the most common form of statewide watershed management -

the 5-year, 5-step rotating basin approach - are struggling to coordinate management steps according to basin schedules. The 5-year rotating basin approach should be seen as one possible means for organizing watershed program work and not an end in itself. States should be flexible in using it but EPA attempts to synchronize programmatic reporting and schedules requirements are needed in some cases.

- EPA and states disagree over the agency's commitment to supporting statewide watershed management. Over the past ten years, EPA has devoted a considerable amount of resources to promoting the watershed approach. Unfortunately, many states feel that EPA has not demonstrated enough support or sensitivity to state watershed management in its rules, policies, and oversight. EPA needs to go beyond simply providing states training and technical assistance in statewide watershed facilitation and needs to identify and eliminate the barriers and constraints that its rules, policies, organizational structures, and oversight practices pose to state watershed efforts.
- State-facilitated basin/watershed planning processes represent significant opportunities for EPA efforts to integrate CWA and SDWA water quality program requirements. If necessary, they could serve as a foundation for reviving the 303(e) continuous planning process as a vehicle for fostering greater integration across water program elements.

#### Recommendations

- EPA should work with states to adopt a multi-pronged approach to support statewide watershed management: (1) promote key elements of the approach by senior management; (2) offer incentives, flexibility, and training for states that haven't adopted the approach to initiate framework development and experimentation; (3) investigate and develop solutions to key barriers to state watershed management; (4) become more actively involved in state watershed/basin planning and implementation; (5) review and, where necessary, revise grant evaluation criteria and resource allocation formulas (i.e., CWA 104(b), 106, 319 grants) to promote integrated watershed management; (6) develop performance measures under GPRA to assess progress of integrated watershed management in achieving environmental results; and (7) develop organizational frameworks and partnerships at the federal, state, and local level that facilitate better integration and coordination within and between CWA and SDWA programs.
- States should consider adopting several key actions to improve their watershed approaches: (1) evaluate whether their watershed management frameworks have the necessary components that facilitate resource leveraging, program integration, and accountability; (2) consider developing regulations and/or legislation (with the appropriate resources) that support existing basin /watershed planning processes; (3) improve the integration of more programs - standards, SRF, 319, TMDL, coastal and wetlands protection - into their state watershed approaches; and, (4) link state-sponsored basin planning with local planning/zoning efforts more effectively.

## **A Review of Statewide Watershed Management Approaches**

### **I. INTRODUCTION**

#### **A. Background**

Over the past decade, more than 20 states have adopted a watershed approach to their management of statewide water programs. Watershed management is not a new regulatory program, but rather a way of coordinating and/or integrating existing programs and building new partnerships to better achieve shared water resources management goals and objectives. To make coordination easier and more effective many states have designed management frameworks, or a lasting process for partners working together. These frameworks include a support structure for coordinating efforts or integrating core program elements, including operating procedures, time lines, and ways to communicate. Success in watershed management is measured in terms of improving and maintaining environmental quality and protecting public health (i.e., watershed ecosystem integrity).

During the past ten years, EPA headquarters and regional offices have undertaken numerous efforts to assist states in adopting watershed management approaches by providing technical assistance, publishing communication and outreach materials, and offering facilitation and training. Since 1991, EPA has published the following documents and guidance promoting state adoption of the watershed approach: *NPDES Watershed Strategy* (1991), *The Watershed Approach - Our Framework for Ecosystem Protection* (1994), *Watershed Protection: A Statewide Approach* (1995), and *The Watershed Approach Framework* (1996). In addition, EPA has provided facilitation support and training to over 20 states to develop statewide watershed management frameworks. This training is also available to states via internet access on EPA's Watershed Academy web site (<http://www.epa.gov/watertrain>).

In January 2001, EPA's Office of Wastewater Management (OWM) and the Office of Wetlands, Oceans, and Watersheds (OWOW) initiated a review of selected states' experiences with the statewide watershed management approach. The review had three main objectives:

- Identify the different models of statewide watershed management and describe their organizational and functional components.
- Characterize and assess the experiences of selected states using different models for statewide watershed management.

- Develop recommendations to improve EPA’s support and states’ implementation of statewide watershed management.

This document contains the results of the review. Michael Mason, on detail to the Office of Wetlands, Oceans, and Watersheds from the Office of Wastewater Management, served as project leader for the review and primary author of this report with analytical support from Tetra Tech, Inc.

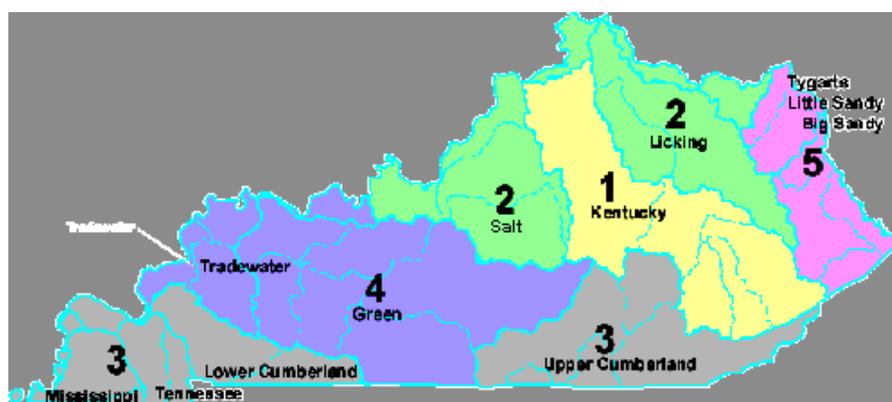
## B. Definition of Statewide Watershed Management

The operating definition for a statewide watershed approach used for this study consisted of five key components:

- delineation of a state into natural geographic (e.g., watershed/basin) management areas;
- a series or sequence of management steps or phases to guide regulatory and non-regulatory actions within geographic areas (i.e., monitoring, assessment, planning, implementation);
- the integration of CWA and other water resource programs through the coordinated implementation of management steps and the formation of partnerships;
- an established process for involving stakeholders through formal or ad hoc meetings, committees, and comment periods; and
- a focus on environmental results rather than only program measures.

The term “statewide” refers to a watershed approach that is used by state agencies across the entire state and not in just a few places or “special projects.” This review focused on state-sponsored or state-driven watershed approaches and did not collect information on the experiences or assess the effectiveness of locally-driven watershed approaches. Many states around the country have a longstanding grassroots-based watershed “tradition” that is often separate and pre-date the advent of the watershed approach driven by state water quality programs.

One of the most common forms of statewide watershed management is the “rotating basin approach.” In this approach, watersheds in a state are grouped into basin management units consisting of discrete bundles of watersheds and subwatersheds. States group watersheds



**Figure 1:** Geographic Management Units for Kentucky

according to a variety of criteria such as keeping whole basins intact, grouping similar ecoregions, maintaining management units of equivalent size, and/or balancing state program workloads. (See Figure 1 as an example).

After geographic management units are designated, states have adopted a five-step watershed management process to focus process activities within each basin while staggering the overall workload statewide. Under this framework, watershed assessment, planning, and management activities are grouped into five general categories: (1) Data

Collection/Monitoring, (2) Assessment/Prioritization, (3) Strategy Development, (4) Basin Plan Review/Approval and (5) Implementation (see Figure 2).

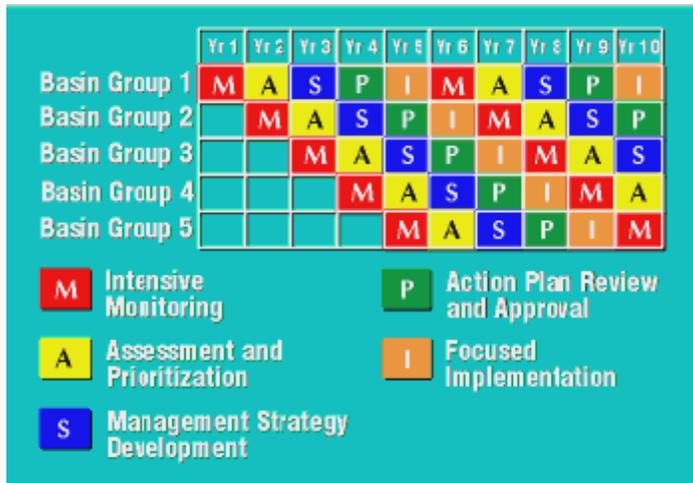


Figure 2: Example of Rotating Basin Schedule

Implementation of the approach involves beginning the management cycle, (i.e., conducting scoping/monitoring activities) in one basin (or management unit) during the first year. The following year, the second step (assessment/prioritization) is initiated in the first basin while another basin begins scoping/evaluation. This process of moving sequentially through the five management steps in each basin while adding a new basin each year over the first five years results in watershed management “rounds” that helps states focus resources tied to particular management steps (e.g., monitoring) in a single management unit each year rather than at scattered locations across the state.

The five-step process is usually revised after the initial five-year implementation phase in recognition of the iterative nature of the process and the tendency of some activities to take longer than others. Implementation of management actions, for example, often takes many years – even a decade. Monitoring and re-assessment might occur within a year or two after implementation of management practices rather than only once every five years.

### C. Study Approach

The study consisted of a four stage approach to collecting and analyzing information and developing findings and conclusions. First, the project team reviewed selected EPA and state program documents and outside reports and interviewed a number of EPA regional and headquarters managers to identify the key issues and questions regarding statewide watershed management approaches.

Second, the project team selected the following states for the review:

- **Kentucky**
- **Massachusetts**
- **New Jersey**
- **North Carolina**
- **Ohio**
- **Oregon**
- **Texas**
- **Washington**

These states were selected based on the following general criteria: (1) each state had adopted a statewide watershed management approach; (2) had at least 2 years of experience implementing the approach; (3) represented a range of geography, types, or models of watershed management approaches; and (4) were recommended by a number of EPA headquarters and regional managers.

Third, the project team facilitated structured discussion sessions and interviews in-person or by telephone with managers and staff in each of the eight states. Session attendees and interviewees included state water quality program directors and managers; basin coordinators and team leaders; and representatives from selected state watershed associations. Based on these discussions and interviews, the project team developed individual summaries of each state’s experience with the watershed management approach (abridged summaries of each state’s approach are provided in Appendix A attached to this report).

And finally, the state summaries were analyzed to develop the key findings, conclusions, and recommendations based on all eight states’ experiences with the watershed approach. In most cases, the findings in this report reflect common trends across all eight states and generally do not focus on issues and concerns within specific states. In order to maintain the anonymity of the interviewees and discussion session attendees, quotations or examples used in the report are not attributed to any individual or group.

The report includes three main sections: (1) key findings across all eight states on program management, coordination across programs and state agencies, and state-local coordination and public involvement; (2) findings on the experiences of six core water program areas with the statewide watershed management approach; and (3) conclusions and recommendations.

## **II. STATES’ WATERSHED MANAGEMENT EXPERIENCES**

### **A. Description of Statewide Watershed Management Approaches**

- **Statewide watershed approaches are unique in their genesis and subsequent development.** (See Figure 3)

Watershed approaches have been spawned or significantly supported by leadership from state governor's offices, legislatures, environmental secretaries, and water quality agencies. Forces that drive creation of state watershed approaches have included a desire to more efficiently manage state water agency programs (KY, MA, OH, TX, NJ, WA), address threats to a highly valued resource (WA, OR; anadromous fish protection/restoration), or improve local input and involvement in water resource protection and restoration activities (KY, NJ, MA, OR, WA). Often a combination of driving forces (e.g., programmatic efficiency initiatives, resource concerns) will generate the critical mass required for developing and implementing a state watershed program.

The review found that there are two basic models of statewide watershed management among the eight states: (1) six states adopted a state-sponsored basin planning and management approach (KY, MA, NJ, NC, OH, TX, WA); and (2) two states adopted a local watershed/government-driven planning approach (OR, WA). Both of these models may include a variety of elements and approaches such as: a process for rotating management activities (e.g., monitoring, planning, permitting) around state river basins over an established - usually 5-year- time period; institutional elements for maintaining partnerships and coordinating activities (e.g., steering committees, basin teams); and/or significant stakeholder involvement processes managed by statewide committees, basin coordinators, or watershed teams. *For brief descriptions of each state's watershed management approach, see appendix 1 (page 50).*

[ An asterisk (\*) indicates program has been partially involved in the statewide watershed management approach.]

The trend in state watershed management appears to be toward a more localized, partnership-based approach driven by multi-stakeholder teams. State watershed programs that developed early (e.g., North Carolina, initial programs in Texas, Washington, and Ohio) tended to focus mostly on developing and better coordinating federally delegated Clean Water Act programs (e.g., NPDES, 319, 305b) on a basin-wide level. New programs – and older programs that have matured – have added significant opportunities for public input and involvement (MA, NJ). For example, nearly all states now have fairly sophisticated processes for engaging or supporting external stakeholder groups or steering committees populated by state and non-state agency stakeholders.

And finally, states such as Washington and Oregon have established “local” watershed approaches that are enabled by legislative action and supported by significant state resources. These local watershed

State	Type	Origin	Year	Statute	CWA Programs
KY	Rotating basin 5 year/5 steps	WQ agency	1997	No	303d*, 305b, 319, 402
MA	Rotating basin 5 year/5 steps	DEP Sec'try	1993	No	303d, 305b, 319, 402 (w/EPA)
NJ	Basin Management Areas	DEP Sec'try	1999	No Prop. Reg	303d*, 305b, 319, 402*
NC	Rotating basin 5 years/5 steps	WQ agency	1991	Yes	303a*, 303d*, 305b, 402
OH	Rotating basin 5 years/5 steps	WQ agency	1990/7	No	303d, 305b, 319*, 402
OR	Local watershed councils	Governor	1997	Yes	303d, 305b, 319*
TX	River authorities	WQ/statute	1996/9	Yes	305b, 319*, 402
WA	River Basin & Local Government Planning	WQ/statute	1995/8	Yes	303d, 305b, 319*, 402

**Figure 3: Summary of Eight States' Watershed Management Approaches**

approaches technically are not “driven” by state agencies but often support state program responsibilities (i.e., non-point sources project implementation, TMDL development and planning). States water program managers acknowledge that the watershed approach should involve local land use planning but state legislatures have been reluctant to provide more state authority for what has been a traditionally local responsibility. As a result, planning and zoning is still very much a local process, and

it is unclear whether or not state water quality priorities are considered in planning and zoning decisions.

From a statewide management perspective, the rotating basin approach is probably easier to implement, since it provides an organized framework for developing and implementing a sequential management program across an entire state. Providing support and tracking the activities of dozens of watershed management areas throughout a state can be difficult, given that each will be moving through the process at different times and rates of speed. Locally led processes, such as those enabled by legislation in Washington and Oregon, are even more numerous and challenging in terms of tracking and support.

### **B. Program Management Benefits**

- **Most state managers are generally positive about their state's experience with the watershed approach and thought that it had contributed to the improved efficiency and effectiveness of their water quality programs.**

States noted that although considerable effort is required to develop and initially implement a watershed approach, most said that overall agency's efficiency and effectiveness had improved after the approaches were operational. States identified a number of benefits resulting from the approach:

- Increase in the amount and quality of monitoring data. Almost all state managers stated that the statewide watershed approach has resulted in a significant increase in the amount of monitoring data. For example, North Carolina reported thirty percent more monitoring information has been collected using the same resources due to less travel and more partnerships with other entities. Partnerships with other agencies involved in watershed monitoring (e.g., U.S. Fish and Wildlife Service, U.S. Geological Survey, National Marine Fisheries Service, state conservation and agricultural agencies, water/wastewater utilities) has helped improve the coordination, integration, and use of existing data in watershed assessments.
- More focused and better quality assessments. Many states also noted that the watershed approach has led to more in-depth information on the nature and sources of water body impairments and consequently this has led to a better refinement in listing and de-listing of impaired waters. For example, Washington's Department of Ecology staff is using watershed assessment information to de-list some waters; Kentucky is discovering that monitoring and assessment information from their statewide watershed approach is resulting in additional findings of impaired waters.
- More effective linkage between water quality planning and implementation. States that develop basin plans noted the plans can be useful tools for involving stakeholders in helping make decisions on what actions are needed for maintaining and restoring water quality. For example,

North Carolina water resource agency staff noted an open and inclusive basin planning process provides a good venue for raising public awareness about TMDLs, providing education on possible management strategies, and discussing implementation approaches.

- Better coordinated and more equitable NPDES permitting programs. States felt that synchronizing the issuance of NPDES permits according to basins has improved modeling and analyses of effluent discharge impacts, receiving waters' assimilative capacity, and cumulative effects on aquatic systems. In addition, many states noted that addressing all permits in a basin at the same time helped to focus permitting activities, reduced travel time for monitoring and inspections, and allowed more time for inspecting smaller dischargers that had escaped scrutiny in the past. In one state, basin-wide permitting has improved the state's ability to issue permits that support watershed-based TMDLs.
- Improved integration and coordination of state water quality program functions and goals. State agencies are collectively applying their resources more effectively to watershed assessment, planning, and management.

In sum, states' experience with the statewide watershed approach demonstrates the importance that improved water quality monitoring programs can have on the effectiveness of the overall water program: Better data leads to more accurate assessments, which creates better quality TMDLs, that can produce more effective permit limits and non-point source controls.

Although greater program efficiency, integration, and public involvement were viewed as the chief benefits resulting from states' adoption of the watershed approach, what is noteworthy is how few states mentioned environmental results as a primary benefit of the approach. There may be several reasons for this omission: First, most states involved in the review are in the early stages of the watershed approach and it is too soon to be able to demonstrate water quality benefits attributed to the approach; second, tying environmental results to specific management strategies can be time consuming and costly; and third, some states admitted that the primary goal of adopting the approach was not to demonstrate water quality results but merely to improve efficiency in the management of state resources.

### **C. State-Level Program Management Barriers**

States identified the following state-level program management barriers to implementing statewide watershed management approaches:

- **Program-specific requirements and fragmented management systems often conflict with state efforts to integrate water quality program activities on a watershed basis.** Many states acknowledged that a great deal of tension exist between programmatic requirements and statewide watershed management activities. Keeping managers from the traditional "stovepipe" Clean

Water Act programs (e.g., sections 305(b), 319, 303(d), 402, etc.) on board is an ongoing challenge since their programmatic obligations can frequently limit their involvement in watershed activities. As one interviewee said, “developing a big enough vision to transcend the programmatic hurdles has been a real challenge. The watershed approach alone is not enough to drive overall watershed activities.” It can be difficult for some programs to adjust to the approach especially if they are understaffed or pulled in different directions by annual program commitments (e.g., “beans”) and periodic deadlines. Several states argued that consolidating reporting requirements would improve coordination and information sharing.

Staff fear and resentment can sometimes be an issue when making the transition from a program-based water quality program to a watershed-based, matrix management approach. For example, in one state that recently adopted the approach many staff were pulled out of their areas of expertise and placed on watershed teams where they were required to interact and perform their work in different ways. Some staff feared having to learn new regulations and become experts in unfamiliar areas. Many staff felt pulled in too many directions and did not have the time to be completely involved in a watershed team. For some staff, time commitments (and priority) usually went first to the program and then to the more generalized goals of the watershed team.

- **Uneven workloads across state basins and shifting implementation priorities often conflict with basin plans and schedules.**

States that have point sources grouped unevenly around the state often find it difficult if not infeasible to synchronize the issuing of NPDES permits or conduct inspections at wastewater facilities according to an established 5 year basin-wide schedule. In addition, NPDES permits might need to be reissued outside of the basin cycle because a plant wants to expand or the state may need more time to address unusually complex permitting issues. Special monitoring efforts are sometimes needed to address citizen complaints or gather more data for TMDL development. Other programs (e.g., wetland permitting, groundwater permitting) require staff to respond to violations despite regular scheduled activities.

- **Many states claim that they lack adequate resources for key elements of statewide watershed management such as hiring basin coordinators, conducting basin-wide assessments, and providing targeted public outreach programs.**

Many states claim that their agency’s watershed management and basin planning units have about half the number of coordinators and planners that they need to cover adequately all the basins within a state. As a result, there is often not enough time to work on more than one basin at a time. Some states need more resources to develop basin assessment reports and create cumulative assessments on a watershed basis to supplement TMDL development. For example, one state manager highlighted the disparity in resources devoted to assessments by noting that there were 55 staff members across the state working on ambient monitoring and only 5 people working on conducting assessments. And finally, several

states lamented that there never seems to be enough resources for public outreach or adult education programs pertaining to water quality. Senior agency managers, they argue, consistently undervalue the importance and amount of work involved in providing public access to watershed planning and information.

On the other hand, some states have established discrete funding sources or state trust funds that can be used to support state-lead basin planning activities as well as locally-driven watershed projects. For example, the Massachusetts Watershed Initiative receives \$3.5 million in funding with most of the money allocated for state watershed projects and additional money for operational cost for the initiative.

- **State agency managers and staff feel vulnerable to changes in senior management commitment to the watershed approach.**

Despite the enormous investments some states have made in the watershed approach, changes in political leadership can affect senior level commitment to the approach. For example, the Massachusetts Watershed Initiative relies heavily on the Secretary's office for resources and staffing support. Although support for the Initiative has been strong up to now, state managers are concerned that it could diminish with a shift in leadership. Some states, however, have managed to institutionalize their watershed approaches through legislation or formal rule making (see Figure 3) in order to reduce the impact from changes in government leadership.

- **States have made little effort to document or evaluate their experience with the statewide watershed management approach.**

State managers identified several reasons for not evaluating or documenting lessons learned from their experiences with statewide watershed management: (1) states had neither the time nor the resources to devote to evaluating the effectiveness of their approach; (2) it would be too difficult to attribute gains in ambient water quality to any management efforts over the long term due to changes in sampling methodologies over time, different locations of sampling stations, and shifts in 303(d) stream assessment priorities; and, (3) some states are still in the early stage of their statewide watershed management approach and they did not have enough experience to make evaluation efforts worthwhile; and, (4) almost all states agreed that developing measures of success has been difficult. More initiative by states and help from EPA, however, is needed to develop effective metrics to measure trends over time.

#### **D. EPA Program Management Barriers**

All states identified a number of EPA policies and management approaches that create serious barriers to their efforts to implement a statewide watershed management approach. State managers frequently argued that EPA's policies and approach to oversight do not recognize the differences in states' water quality management approaches and build in flexibility accordingly. For example, one state manager

maintained that EPA guidance documents appear to be written as if the watershed approach does not exist and for watershed managers it is not clear how the various guidance documents fit into a watershed-based system. The following section includes descriptions of some of the most common EPA barriers.

- **EPA’s oversight of state programs is fragmented and output-oriented rather than integrated and driven by environmental results.**

States that have oriented their water quality management programs according to basin management areas or watersheds indicated that EPA-state relations are constrained by program-specific management approaches imposed by EPA’s headquarters and regional offices. Each federally-mandated program has its own administrative and program requirements (i.e., number of permits issued, TMDLs approved, etc.) that can overshadow information on actual environmental results at the basin/watershed level. Although EPA policies push for environmental “progress” and long-term management, states claim the agency’s regulations and approach to oversight stay focused on short-term priorities such as what is on or off the 303(d) list or what are the “correct” effluent limits for point sources. States maintain that statewide watershed management is not a program-centered approach, and EPA needs to reduce its emphasis on program-by-program management and establish a more holistic, results-driven approach to water quality management. Several states suggested that EPA should de-emphasize tracking specific program activities, and focus instead on results-based management activities (e.g., increased acres of waters restored) within the state and indicators (e.g., attaining water quality standards) within whole watersheds.

One state argued for an assessment-based watershed approach that identifies key stressors and develops science based management actions to address them as opposed to a program-based approach that focuses on programmatic goals and objectives. States would be encouraged to support the development of comprehensive watershed plans by using the combined resources of various programs rather than a stream reach-by-reach and pollutant parameter-by-parameter approach.

One example of an EPA policy that was frequently criticized by states as representing a serious barrier to statewide watershed approach was the agency’s policy on reducing the states’ backlog of expired NPDES permits. Some states thought that the goals and timelines for reducing the permit backlog needed to be revised or made more flexible to fit their resource constraints and basin cycles. EPA’s backlog reduction strategy, they argue, has diverted resources away from other areas of the watershed approach. One state manager suggested EPA should allow states that have adopted the rotating basin approach to deal with their permit backlog according to their five year schedule. Under this approach, expired permits would be reissued when program implementation (management step 4, year 4) is scheduled within each basin.

- **EPA’s TMDL policy and program oversight conflicts with state efforts to implement water quality programs on a basin or watershed basis.**

Some states are struggling to integrate TMDL development into their statewide watershed approach and still adhere to a 5 year basin schedule as well as meet the EPA-negotiated and/or court ordered timelines. Several states argued that EPA's TMDL policy and the TMDL development process is rigid and does not allow states to be innovative with watershed management. Some of the key problems cited include:

- (1) Tight schedule and limited resources for TMDL development. Although many TMDLs are fairly simple, some states maintain that the large numbers of TMDLs and short timeframes to develop them will require more resources than most states currently possess. Some TMDLs are complex and will require more time to complete than can be accommodated within the one-two year time frame of a basin cycle. Some states argued that efforts to meet EPA's 8-13 year TMDL schedule or a court ordered timeframe imposed under a consent decree will divert resources away from work on other projects - proactive modeling or assessment of cumulative impacts of a full array of stressors - that might achieve the best ecological results. Furthermore, TMDL-associated monitoring can be much more resource intensive than normal ambient monitoring and may divert resources away from efforts to achieve baseline monitoring on all waters in the state.

- (2) Limited scale and scope of TMDLs. Many states feel that the current TMDL process emphasizes individual stream reach and single parameter assessments over comprehensive multi-parameter watershed assessments. States would like to see EPA more actively promote listing of impaired waters and development of TMDLs by watershed or basins rather than by stream segments. EPA headquarters staff noted that EPA has encouraged states to "bundle" TMDLs for several waterbody/pollutant combinations within a watershed into one over-arching strategy, and submit this to the agency for review. They maintained that there are numerous examples of such bundled TMDLs having been approved by EPA. Some states, like Oregon and Washington, have begun to develop comprehensive watershed-based TMDLs where each watershed or sub-basin TMDL contains many parameters and stream reaches and there can be as many as 100 "TMDLs" in one document. This allows allocations that are not by segment so the TMDL makes more sense and addresses all segments within a basin.

Furthermore, some states would like EPA to adopt a TMDL oversight process that focused on the quality of TMDLs and not quantity. These states believe EPA should not measure states on the number of TMDLs completed but by the number of assessment miles of waterbodies returned to their designated uses. EPA headquarters staff argued that, unfortunately, this would be a hard sell at this point given states' "neglect" of the TMDL program in the past and the increasing number of court-ordered schedules across the country for developing TMDLs.

- (3) Too much focus on restoration over protection. Some states argued that the TMDL development process is driving the watershed process instead of serving as one possible solution to watershed issues. Many problems may require holistic watershed strategies and not TMDLs. The focus on TMDLs, they

argue, takes resources away from addressing what many states feel are the real problems within many watersheds (e.g., need to protect existing good water quality, deal with water flows, stream channel modification and other non-pollutant stressors). States maintain that TMDL requirements take resources from pro-active water quality protection strategies and re-focuses them on reactive model development that may not be worthwhile. For example, in Oregon, state funded watershed councils are often focused on restoration activities, such as development of TMDLs, rather than more preventative or protective measures, such as the improvement of local zoning ordinances that could prevent future damages. Some states would like EPA to give them the flexibility in pursuing options other than a TMDL if it is decided that an alternative solution is the best option. EPA responded to these arguments by stating that although the Clean Water Act requires states to develop TMDLs for all impaired waters, the agency has stated that it will accept watershed strategies or plans that go by names other than a TMDL as long as they meet the minimal analytical and information requirements for a TMDL.

- **Some EPA initiatives, like the Unified Watershed Assessment, result in numerous inefficiencies and redundancies for state watershed management programs.**

Many states claimed that EPA's "special initiatives" often distract staff, re-direct resources, and confuse watershed program partners, and generally have few benefits for the state. One example mentioned frequently by state managers was the Unified Watershed Assessment (UWA) initiative. As a key part of the 1998 Clean Water Action Plan, the purpose of the UWA was to encourage states, tribes, governments, organizations and the public to work together to conduct unified watershed assessments. This was intended to be a new cooperative, intergovernmental process for assessing watershed conditions, identifying watersheds where aquatic systems do not meet clean water and natural resource goals, and beginning a process of implementing action to restore watershed health. Many states maintained, however, that the initiative diverted resources from the basin-wide approach and resulted in a great deal of confusion, conflict, and duplication of effort. Selected experiences with this initiative include:

- North Carolina claimed the initiative had the effect of delaying basin plan development and creating a backlog in uncompleted plans. If the state had been able to use existing plans or divert UWA resources to developing basin plans, it would have improved the basin plans or made them easier to implement. In addition, the state had to engage in separate public involvement efforts and refocus resources from what was scheduled in the basin-wide plans.
- New Jersey was in the midst of the partnership development phase of their watershed approach and was holding stakeholder meetings in each watershed management area to establish community concerns. Unfortunately, the state was required to submit a report to EPA before it was ready "simply because EPA wanted a Watershed Restoration Action Strategy (WRAS) on file from every state."
- In Ohio, the UWA process came out at the same time that the state had announced its 1998 303(d) list. As a result, the state had two separate lists with watershed priorities and people

were confused about the differences. Eventually, the state stopped mentioning the UWA to avoid confusion and recommended that EPA consider re-evaluation of the timelines for the UWA process.

- **EPA needs to demonstrate more involvement and support for statewide watershed approaches.**

Several states thought that EPA could become more supportive and involved - at both the regional and headquarters levels - in states' watershed management approaches especially during basin/watershed planning processes. One state noted that other federal agencies (e.g., USFWS, NRCS, USGS) routinely participate in watershed/basin planning meetings but EPA has not been represented. More EPA staff presence on basin teams and involvement in their activities would enhance the watershed effort and allow EPA to better understand local and basin issues.

- **Clean Water Act schedule requirements sometimes conflict with states' five year basin cycles.**

The five-year planning and management cycle adopted by some states was envisioned as a catalyst for organizing and synchronizing state water quality programs, but schedule variations under the Clean Water Act mitigate against synchronizing program schedules and management actions. For example, NPDES permits are issued on a five year cycle, water quality standards reviews and revisions occur over a three-year cycle, and 305(b) reports are issued biennially. In addition, recent EPA guidance (Consolidated and Assessment Listing guidance, 2001) has revised the requirement for submitting states 303(d) list of impaired waters from every two years to four years. The multiple and staggered deadlines under the Act often make it difficult for states to effectively meet their statutory requirements and manage their water quality programs according to a regular schedule on a basin or watershed basis. As a result, program requirements go unmet or become meaningless. For example, NPDES permits will sometimes expire before a basin's implementation phase is reached which may temporarily result in a backlog; or, the state may submit water quality inventory or 305(b) reports to EPA that only include water quality data for a subset of a state's waters. EPA headquarters staff recognized the difficulty states face, but argued there was very little EPA could do about it since most of the deadlines are set by statute.

Finally, some states suggested that EPA needs to reduce the lag time between state submission of actions (WQS, TMDLs, 303(d)) and EPA approval. States argued for more predictability on turn-around times. EPA's delay in review times can wreck havoc on state's basin schedules. This can have spill over effects into other programs areas and cause serious delays in implementing other elements of the program (e.g., reissuing permits.). This is especially problematic following the Alaska rule since states are not able to adopt revised water quality standards until approved by EPA.

## **E. Coordination Across Programs and State Agencies**

Statewide watershed management requires more frequent interaction and communication among a number of state and federal governmental agencies with an array of water quality and water resource responsibilities (i.e., drinking water and supply, fish and wildlife, resource conservation, agriculture, and transportation). Agencies with these responsibilities have different mandates, priorities, and methods for dealing with water resources and interacting with local authorities and the public. As a result, coordinating and integrating program functions at the state and basin-wide levels can be a formidable challenge. Lack of coordination can sometimes lead to mis-communication and duplication of effort among state programs.

- **Most states felt that their statewide watershed management approach had improved interagency coordination but it was not as successful as it could be or needs to be.**

Nearly all states agreed that statewide watershed management has significantly improved the level of interagency coordination and cooperation at the state, basin, and watershed level. Consequently, state agencies are collectively applying their resources more effectively to watershed assessment, planning, and management.

Despite these improvements, state managers and staff admitted that there have been some problems along the way. First, most state water quality managers stated that there was some reluctance by many state agencies in stepping forward and embracing the watershed approach in the early years. There was some resistance from agency managers and an initial period of “chaos” and tension before everyone becomes accustomed to their roles. Managers and staff admitted that coordinating across programs and state agencies can be time-consuming and perhaps too much time had been spent on staff interaction and meetings regarding plans and strategies.

Second, some states still face organizational challenges to their statewide watershed approach. For example, state regional or district office territories rarely correspond to basin management units and district managers and staff can sometimes feel left out of basin planning efforts that are lead out of an agency’s central office. North Carolina’s experience has demonstrated the need for better coordination between state water quality central and regional offices in developing and implementing basin monitoring strategies and targeting and evaluating nonpoint source funds. In Oregon, duplication of monitoring efforts between watershed councils and the Department of Agriculture has been an issue. In Texas, the state environmental agency was recently reorganized along functional lines (e.g., permitting, assessment, enforcement) making it difficult to coordinate media or geographic-based efforts. This has caused a significant shift in how the state watershed program is structured and how it functions.

Third, in states where there are multiple state-sponsored watershed and environmental efforts (e.g., salmon recovery in Oregon and Washington), there is often a lack of coordinated funding and implementation at the watershed level. Local groups prefer coordinated funding but state agencies resist it for a variety of reasons. State managers maintain that grants help in the development of

relationships and if funding came from one source, individual agencies may lose their ties to local landowners, business, and municipalities. Locals complain, however, that the sheer number of state watershed initiatives can make it difficult for them to determine which ones serve what purpose. As a result, multiple agency programs and state-sponsored watershed approaches too often result in piecemeal rather than holistic approaches. The lack of coordination has led to duplication of efforts where local groups will unintentionally “reinvent” the watershed approach or state-sponsored and local groups - like watershed councils and conservation districts - will grapple with the same issues independently.

Finally, cooperative watershed management involves significant investments in up-front coordination, power-sharing, and ongoing communication among partners. In recent years, the TMDL issue has caused some states to develop a new focus on watershed management, but that interest may be limited to simply satisfying the legal requirements of the TMDL program. The challenge facing many state water programs is in convincing other agencies to not only participate in the watershed process, but to agree to common water quality goals and work to achieve them.

- **Firm commitment and clear direction from top agency managers is vital to building successful multi-agency watershed management programs.**

Building an integrated, cooperative watershed management program is difficult without a firm, clear mandate from top government officials. Several states suggested that commitment and accountability are greatly enhanced if the governor’s office and/or state regulations bind agencies and other stakeholders to watershed management programs. Endorsement of a watershed management framework by the governor, the legislature, or a coalition of top agency officials provides the impetus for senior staff from those entities to find ways to cooperate, coordinate actions, and communicate more effectively. For example, the redevelopment of the Texas watershed program through legislative and executive action prompted the water resource agency to execute a significant portion of its watershed program through existing river authorities, which include city governments, utilities, private interests, and other stakeholders. In Oregon, the Department of Agriculture is reviewing farm water quality plans to see how they can accommodate TMDL development while the Department of Transportation is moving to protect threatened and endangered species and enhance riparian vegetation due to the high priority placed on watershed management by the governor. All states agreed that commitment from top agency officials needs to occur early in the process in order to drive initial discussions regarding program organization and management.

- **Tightly focused organizational frameworks that include statewide steering committees, dedicated basin coordinators, multi-stakeholder basin teams, and comprehensive basin plans provide an efficient and effective model for watershed protection and restoration.**

Everyone understands that the watershed scale is the most effective way of protecting and restoring

aquatic ecosystems, but difficulties remain in translating this to on-the-ground workers. Many states have created watershed frameworks that include a coordinated management schedule (e.g., rotating phases by basin) based on a set of common goals and objectives (e.g., protecting a threatened resource) and a set of established institutional mechanisms or elements for coordinating decision-making and implementation across state agencies.

There are four basic coordination elements or mechanisms that have been adopted by states. First, many states initially established a formal cross-agency steering committee consisting of numerous state agency executives and non-governmental stakeholders to assist in the development of their statewide watershed management framework. In some states, these steering committees (or “roundtables”) have continued to operate and act as an advisory group to help guide senior state managers in setting priorities and making policy and resources recommendations (e.g., Kentucky, Massachusetts).

Second, other states have formed formal basin-wide committees or teams consisting of state agency representatives and basin stakeholders that are responsible for planning, setting priorities, and coordinating agency activities (e.g., monitoring, funding). Basin teams provide the means for day-to-day planning and implementation coordination, leveraging the information and resource expertise among partner agencies and organizations to get the work done. By investing staff and resources into basin teams, partners demonstrate commitment and remain engaged in the process. Basin team leaders provide the day-to-day organizational and communication skills to keep the basin teams moving according to a set schedule and keeping the steering committee informed of progress and policy and resource issues that need to be resolved.

Third, other states, however, have not established formal basin coordination groups but have designated a state official with the responsibility for coordinating basin planning, public involvement, and the implementation of state programs. This approach is effective for coordinating internal agency programs, but presents serious difficulties when integration of external entities or non-governmental groups is necessary. Since there is no formal partnership with other agencies outside of a statewide steering committee, the basin coordinator does not have a ready means to address policy and resource issues when other agencies are not cooperating. Indeed, why should they cooperate or be held accountable when it is perceived to be the responsibility of the basin coordinator’s home agency? Having one individual responsible for making sure that all agencies and stakeholders are integrated and involved can be an overwhelming task

Fourth, several states have adopted basin-wide plans as a means to coordinate across state agencies and communicate with the public (i.e., Kentucky, Massachusetts, North Carolina). Basin-wide plans have been useful in providing a tangible framework for prioritizing needs, targeting resources, and guiding implementation efforts. Basin-wide planning, however, does require a considerable amount of internal effort within water quality offices and states need to maintain an appropriate level of resources to support it.

- **Cooperative, integrated multi-stakeholder watershed management approaches help focus and coordinate activities but tend to dilute responsibility and obscure who is ultimately accountable for achieving management goals.**

The majority of states noted that accountability was a significant issue in effectively implementing their watershed approach. Regardless of whether states have basin coordinators, committees, or plans, many state program managers and staff are not held accountable for achieving stated goals. In states that develop basin plans, like North Carolina and Massachusetts, clear responsibilities and a mechanism for tracking commitments have not been institutionalized in the plans. As one state manager noted: “If a program manager doesn’t want to commit to an action item in a basin plan, it doesn’t get done.”

More clarity is needed for how different interests will commit to and support basin plans, divvy up resources, and delineate each agencies’ role for each basin cycle. In states like Oregon and Washington that have a myriad of state-sponsored watershed-related efforts, several state staff maintained that no one is ultimately accountable for environmental results. Currently agencies are only responsible for their respective pieces of the watershed approach which creates difficulties in assessing effectiveness.

#### **F. Public Involvement and State-Local Coordination**

A key element of the statewide watershed management approach is an established process for involving external stakeholders and the public in government planning and decision-making at the watershed level. The study attempted to determine how and to what extent the approach increased public involvement and improved coordination between state and local water quality efforts.

- **Statewide watershed management has greatly increased opportunities for public involvement in state water quality and resource management.**

Most state watershed programs have devoted a significant amount of resources to engaging and involving external stakeholders and private citizens in their activities. For example, water quality agencies in Ohio, Kentucky, Massachusetts, and New Jersey have provided staff and other resources to geographically-based management teams in large part to solicit and consider external input and recommendations. States are providing much of the staffing for basin coordinators and watershed team leaders and will often allocate resources when available for public outreach and education.

Most states reported significant increases in public input and involvement, to the extent that their water resource agencies are somewhat taxed in dealing with it. States report that public involvement takes time and money at both ends: soliciting the input and then dealing with it afterwards. In Oregon, state water resource agency staff are trying to keep up with the activities of more than 90 watershed councils and dozens of other local groups focused on mostly local issues. Staff from North Carolina, Kentucky, and other states reported that they were not prepared for the amount of time and resources needed to

effectively engage and respond to public concerns, advice, or information.

On the other hand, some states maintain that despite spending a fair amount of resources on public involvement and outreach, citizen participation has been relatively limited. Despite the benefits inherent in involving the public, enticing the public to attend basin-wide workshops, meetings, and participate in informal comment periods continues to be a challenge for many state program managers. It is possible that states that have had trouble getting the public to attend basin meetings are not considering human nature and social tendencies. When a government agency holds a special basin meeting or workshop and invites the public to attend, many in the public may perceive that the agency is simply going through the motions. For these states, a better approach for soliciting input and advice might be to adapt state outreach efforts according to the established participation processes of existing groups. For example, the core agencies involved in watershed management should solicit their primary contacts from existing social organizations (e.g., Association of Municipal Governments, Chambers of Commerce, Rotary, Sierra Club, Homebuilders Association, etc.). These contacts become information liaisons to the core agency, able to communicate basin management information out to their constituencies at meetings and through newsletters and to collect feedback from members and relay it back to the core agencies. This method can be highly effective and resource efficient, since the core agencies are tapping into organizations that already exist and have active members.

- **Public involvement efforts can create tension between state agencies and the public but it has mutual benefits for both.**

State agency personnel often must wear two hats when working with watershed associations: one as a regulator and the other as watershed team participator. This can be problematic when state agency decisions must go against a watershed association's point of view. Nevertheless, the dynamic tension created when state water quality agencies promote an approach heavily dependent on local input, involvement, and support can be both synergistic and productive if adequate resources are provided to the local groups. States often describe their most notable successes as occurring in watersheds with strong stakeholder groups supported by state and other resources. While it may be difficult in some cases for states to devolve agenda-setting and priority-establishing powers (and associated funding) to local entities, such an approach enhances the prospect for local buy-in, support, and action. The challenge for states has been to provide enough flexibility and support to local organizations to ensure their active engagement while maintaining the ability to focus watershed actions on attainment of state water quality standards.

The state-local partnership approach is of particular interest when states use their watershed programs as a venue to develop and implement TMDLs. In these situations, states build local partnerships and support in order to develop TMDLs that are realistic and implementable. Some state managers indicated, however, that many national environmental associations are suspicious of the state's watershed approach and fear that it is catering to the regulated community. In other cases, the public can become easily confused about what is a statutory requirement and what is a discretionary process

(e.g., 5 phases of the basin approach). Local stakeholders must acknowledge the position the state is in – faced with legal requirements to act – and support solutions that are efficient and workable. Getting to this point, however, can be extremely difficult due to the amount of effort required to characterize water resource conditions, identify likely problems, engage and educate stakeholders, and acquire resources to support implementation.

- **Despite greater opportunities for public involvement and input, few statewide watershed management programs have built significant linkages to local government planning, zoning, or land use authorities.**

Many state staff interviewed recognized the importance of linking water quality impacts with land use management practices, but admitted that local government engagement in state-sponsored watershed approaches has been absent or tenuous at best. States thought there were several reasons for this: First, water quality is one of many issues that local elected officials have to deal with and it can be hard to obtain and sustain their attention. Second, some state governments are careful to avoid interfering with local economic and political interest and prerogatives. States maintain that local elected officials are mostly interested in watershed management when the topics of water supply, permitting, funding for water or wastewater infrastructure, or local economic interests are under consideration.

In a few states, however, local governments are involved in watershed programs at varying levels. For example, in Washington a state statute mandates that water supply planning and flood control issues be addressed by planning groups sponsored by local governments. A possible downside of this approach is the creation of local planning commissions/authorities that are heavily weighted toward local economic or political interests and may not appropriately consider water quality or ecological concerns. A new approach being implemented in Georgia (a state not visited for this study) that requires tying water withdrawal and discharge permits to watershed plans might be a more effective approach for spurring the interest and involvement of local officials.

### **III. INDIVIDUAL PROGRAMS' EXPERIENCE WITH STATEWIDE WATERSHED MANAGEMENT**

One of the key objectives of the study was to determine how and to what extent states have integrated specific water program elements (i.e., water quality standards, monitoring, permits, TMDLs, wetlands, source water, and coastal protection) into their version of statewide watershed management. For those programs that have been integrated into the approach, the study attempted to capture the lessons learned from their experiences, especially what positive and/or negative impacts the approach has had on the implementation of their programs. For those programs not integrated into the statewide

watershed approach, we attempted to determine the key factors that prevented their involvement.

- **State monitoring and permitting programs are most involved and have received the greatest benefit from statewide watershed management approaches.**

The eight states under review differ in the level of involvement and integration of Clean Water Act and Safe Drinking Water Act programs in statewide watershed management approaches. Ambient monitoring and NPDES permitting programs were involved in each of the states' watershed approaches. Perhaps the most important reason for this is that in many states a statewide watershed management approach was established primarily as an effort to improve the linkage between these two critical program areas and enhance their efficiency and effectiveness. The prevailing belief among many state managers was that once these programs had adapted to the new approach - usually after an initial 5 year cycle - then more effort would be made to integrate other program elements into the system. In recent years, states have begun to integrate TMDL and 319 programs within the framework of the statewide watershed approach. The remaining CWA and SDWA programs - water quality standards, wetlands, coastal protection, drinking water (SDWA), State Revolving Fund (SRF), and enforcement - have been involved in the approach to a much lesser extent. Reasons for lack of involvement differ for each program area and are provided in the sections below.

Overall, state interviewees agreed that the monitoring and permitting programs have received the greatest benefit from their involvement in the watershed approach. This is primarily due to the fact that these programs have been involved the longest and, as a result, have had more time to assess and demonstrate the value of the approach to their programs. It also has to do with the fact, as mentioned previously, that adoption of the statewide watershed approach was in many states originally driven by state managers and staff in the NPDES permitting and monitoring programs. In recent years, other water programs, especially the TMDL and 319 programs, are beginning to observe benefits from their involvement in the approach.

#### **A. Ambient Monitoring and CWA Section 305(b) Assessment and Reporting**

- **All states reported that statewide watershed management has resulted in dramatic improvements in both the quantity and quality of data.**

All of the states include ambient monitoring and water quality assessment activities in their statewide watershed approaches. Most states cited significant improvements in the amount of water quality data collected, the quality of that data, and improved assessment capabilities as a result of their watershed initiatives. For example, Kentucky reported a ten-fold increase in the amount of good to excellent quality (i.e., screening level) data collected by volunteers organized to assist with the watershed approach and by staff from other state and federal agencies.

Despite significant gains in the amounts of data, many state basin-wide monitoring programs are still

struggling to provide adequate coverage for meeting assessment needs. Data gaps can occur during the “off years” (i.e., years when limited monitoring occurs) in the basin management cycle. Significant planning time is required to ensure that monitoring stations are appropriately spread throughout the state, and that no basin is over or under sampled. Despite an overall increase in data statewide, there is often not enough detail to develop TMDLs or assess smaller stream reaches. For example, Ohio has an extensive network of ambient chemical/physical monitoring sites and biological sites, but the state must still execute special studies outside the basin cycle to develop TMDLs. The state is attempting to develop clustered (i.e., watershed-based) TMDLs to improve the efficiency and utility of such special studies.

- **The lack of data compatibility and uniform quality standards impacts states’ ability to conduct comprehensive watershed or basin assessments.**

The watershed approach forces states to consider internal compatibility among water quality databases, which can magnify issues that were not significant in years prior to adopting the approach. Several states complained that federal and state data systems are often not compatible with each other and do not synthesize very well. These states thought that more work is needed to build and manage databases across agencies that have standardized protocols, metadata reports, and georeferencing capabilities for mapping and modeling. Data incompatibility can make it difficult to compile data at the basin and watershed level and, as a result, it can be difficult to obtain a complete picture of water quality problems and their sources.

Efforts to integrate monitoring efforts in some states have been hampered by the lack of consistent data quality standards and the large number of independent monitoring efforts (20-30) across the state. With so many state organizations involved in collecting water quality data, maintaining adequate uniform standards for data quality can be a challenge. States argued that there needs to be a set of common performance standards and implementation guidelines for determining data quality.

- **Some states are concerned about the quality and usefulness of state and volunteer monitoring data and the effect it has on public expectations .**

Most states with the basin approach have noted a significant increase in the number of volunteer monitoring groups and their involvement in state-sponsored watershed management.<sup>1</sup> Even though the quality of volunteer monitoring data has improved over the past decade it takes state resources to

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<sup>1</sup> It should be noted that the level of volunteer monitoring efforts has increased dramatically across the country, in general. The study did not attempt to compare the level of volunteer monitoring between those states that have adopted a statewide watershed approach and those that have not. As a result, the study does not provide any evidence indicating that states implementing a watershed approach have had greater increases in volunteer monitoring than those that have not.

review the data and determine whether it is sufficient. Unfortunately, many states don't have established protocols for handling volunteer derived data and are struggling to find ways to use it to support some objectives (e.g., public education, water quality screening) while maintaining some discretion on how it's used for other purposes. More training for partner groups and stakeholders on development of quality assurance program plans is needed. One state manager complained that EPA requirements for developing *Quality Assurance Program Plans (QAPP)* for volunteer watershed monitoring groups were too cumbersome (and expensive to implement) and restricts the ability of outside groups to participate in water quality monitoring.

Although many states have actively encouraged public collection of water quality data and have funded volunteer monitoring organizations, states do not want to set up unreasonable public expectations that volunteer monitoring data will necessarily always be used. Several state managers argued that volunteer monitoring data cannot substitute for state-collected data or be used as a basis for legal action. Public expectations are, however, of particular concern for state watershed programs since citizen involvement is such an important component of the approach.

In fact, the beneficial impact of statewide watershed approaches on state monitoring programs poses a something of a dilemma for state water quality programs. On the one hand, the statewide watershed approach has resulted in an improvement in the amount and quality of water quality data - as well as a greater focus on the problems and sources of impairment - at the basin and watershed level. On the other hand, better quality data has also raised expectations among the public for more prompt and effective state action to address water quality issues. As a result, state managers fear that since they do not have the resources to address all the water quality issues that the public has become aware of through the watershed approach they will increasingly become the target of public criticism.

- **The Clean Water Act's requirement to report on the quality of state waters every two years does not coincide with some states' five year basin management cycle.**

Section 305(b) of the Clean Water Act requires that states report to EPA on the quality of their waters every two years. Since many states that are on five-year management cycles monitor only a portion of their state basins every two years, this can result in 305(b) reports to EPA that include updated assessment data for only part of the state's waters. States argued that these reports do not represent an accurate assessment of their states' water quality and, therefore, are of limited usefulness. Some states expressed interest in a five-year reporting cycle for 305(b) or focusing on selected basins per year that could help synchronize required reporting. For example, Kentucky and North Carolina are considering a monitoring approach that would provide a high level of detail annually for a selected set of the total number of basin management units; the other units would be monitored and assessed less intensively until they come up in the five-year cycle. EPA headquarters staff maintain that there is nothing in EPA's 305(b) guidance that prevents states from doing this now. Furthermore, EPA has encouraged states to incorporate innovative approaches, such as probability monitoring, into their rotating basin frameworks. Probability monitoring involves choosing monitoring sites using statistical techniques that allow a state to infer the results for a specific waterbody type across an entire river

basin, ecoregion, or the state. Incorporating this approach into rotating basin frameworks, EPA maintains, can result in more comprehensive assessments and accurate water quality reporting without additional resources.

## **B. Water Quality Standards**

- **The water quality standards process is not significantly involved in any of the states' watershed management approaches.**

The development of water quality criteria are still developed on a statewide basis for all of the eight states involved in this review. The revision of standards and the reclassifications of waterbodies are generally not made on a basin-by-basin basis and are usually submitted to EPA for approval as part of a statewide package. States cited two primary reasons why the standards process has not been integrated into the watershed approach: (1) the requirement under the CWA that standards be reviewed, and if necessary, revised on a triennial basis conflicts with many states' five year basin cycle; and (2) in most states, the development of water quality standards is a formal rule making process with strict administrative and legal procedures whereas basin planning and assessment is usually an informal or ad hoc procedure.

It should be noted that EPA headquarters staff did not give much credence to the first reason and argued that there was nothing in the statutory 3-year triennial review requirement that should conflict with a 5 year basin cycle. Under EPA policy, states do not have to submit revised standards to EPA on a statewide basis and are free to make whatever revisions are necessary to only a portion of their states' waters or basins every three years. Furthermore, many states around the country, including some of the states that were included in this review, fail to meet the statutory 3-year requirement and often submit revised standards to EPA only once or twice every ten years. This should allow states on the 5 year basin cycle enough time to submit standards revisions to EPA for large portions of the state.

- **Many states are interested but cautious about using the basin management approach to develop basin or watershed-specific water quality standards.**

Many states managers and staff expressed an interest in using the basin approach to develop site-specific water quality standards and are beginning to find ways to integrate the program with the watershed approach. Standards development could be synchronized to a great extent with other tasks in the basin approach. Some states, like Kentucky, are already considering developing criteria and standards (e.g., narrative nutrient criteria) for ecoregions within the state. The development of site-or watershed-specific criteria could simply be the next step. One state (Washington) is considering adopting a systematic (i.e, rotating basin) assessment process to support the development of a class-based approach to water quality standards (e.g., standards to protect a given class of waterbody and the assignment of all waterbodies to classes). As more TMDLs are issued, it is likely that the need for more sub-basin or watershed-specific criteria will increase. The need for improved procedures for

site-specific standards appears to be a result of TMDL analysis that frequently turn up exceptions to the prevailing standards. Since state-wide standards are often formatted to accommodate watershed criteria, the reverse may be true - many “basin-specific” criteria could be applicable statewide.

Despite the potential benefits of developing water quality standards and/or criteria by basins or watersheds, many state managers fear that developing basin-specific standards would potentially require more state staff and resources to manage the process (i.e., more public meetings and outreach, increased number of standard submissions to EPA for review). In addition, states were concerned that EPA is unprepared to review and approve significantly more state standards submissions within the 60-90 day time frame as required under the recently issued Alaska rule.

- **In some states, the watershed approach has provided indirect benefits to the water quality standards program.**

Two states (e.g., Texas and North Carolina) indicated that despite the lack of integration of the standards program with the watershed approach, the approach has benefitted their standards development process in several ways. For example, one state found that the basin-wide planning process has improved the level of communication about the standards and classification process between the state, EPA, and the U.S. Fish and Wildlife Service. The basin planning process can bring issues to the forefront, lead to a greater understanding by the public of how standards are written and reclassifications are made, and help act as a trigger for the waterbody classification process. In another state, the improvement in water quality data that results from better coordinated basin-by-basin monitoring has enhanced the state’s ability to assess the need for revising standards.

### **C. Total Maximum Daily Load (TMDLs) Development**

- **The extent of TMDL integration into statewide watershed approaches varies across states.**

Most states acknowledge that TMDLs are beginning to drive their water programs’ mission, but some are ambivalent about fully incorporating TMDL requirements into their statewide watershed programs. A number of states (e.g., Ohio, Oregon, Washington, Massachusetts) have largely embraced TMDL requirements into their statewide watershed approaches. However, other states (e.g., Texas, North Carolina, Kentucky) have dealt with TMDLs separately for a variety of reasons. First, TMDL development and basin planning schedules are often seen as varying and asynchronous. Some states have found it difficult to complete the development of TMDLs within the implementation timeframe of basin management schedules. Second, TMDLs are perceived to be focused on narrow, smaller scales (e.g. stream reaches) whereas watershed management is viewed as broader and more landscape oriented. Third, some state managers thought that TMDLs forced states to focus narrowly on water quality standards violations whereas a watershed management approach looks at multiple stressors and sources.

Several states expressed frustration at the heightened sense of urgency and high priority accompanying TMDL issues over the past five years. TMDL requirements are seen by some states as a rigid, number-crunching exercise that has little to do with improving water resource conditions. Some state staff noted that there is no current requirement for actual implementation of TMDLs and no requirement for USEPA to review and approve implementation plans. As a result, they are uncertain if a significant investment of resources for TMDL development will ultimately produce clear environmental results. Other state staff noted some resentment among watershed stakeholders that TMDLs seem to be driving state water resource agencies and the deployment of watershed protection and restoration resources.

- **Elements of statewide watershed management - interagency collaboration, stakeholder involvement, intensive monitoring and assessment efforts - can provide benefits and set the stage for more effective TMDL programs.**

Most states noted that the lessons learned from their experiences with statewide watershed management have provided an excellent orientation for TMDL development and implementation. States that fully embrace TMDLs into their watershed programs view the approach as an efficient way to address multiple programmatic issues and responsibilities. For example, Ohio decided in 1998 that the watershed approach was such a good model for TMDL activities that it made TMDLs the focus of its rotating basin approach. Both Ohio and Oregon are proceeding with plans to develop clustered or whole watershed TMDLs that group impaired waterbodies and pollutants and sources in those catchments for TMDL modeling, analysis, and development. Both states are working with local stakeholders to ensure that TMDLs are realistic and that implementation plans are viable.

In states with multiple watershed-like initiatives operated by different entities (e.g., Oregon, Washington), strong regulatory requirements, like TMDL development, can provide a focus and structure for the many watershed-enhancing activities likely to be sponsored by discrete groups interested in protecting and restoring environmental resources. Such an effect is often seen when a highly valued, highly visible resource (e.g., salmon, the Chesapeake Bay, the Charles River, Huntington Beach) is threatened by single or multiple pollutants linked to one or more sources.

The perceived dichotomy between TMDLs “narrow” focus on individual pollutants and stream reaches and watershed management broader focus on multi-stressors and landscapes is being handled in some states by integrating 303(d) listed streams and their related water quality criteria deficiencies into broader watershed assessments and analysis. North Carolina and Kentucky, which have not fully integrated TMDLs into their watershed management programs, expressly include use-impaired status and other TMDL issues into their basin assessments, status reports, and plans. This approach lays the groundwork for eventual pollutant load allocation and TMDL implementation even though the TMDL analyses and development is handled separately during the initial part of the process. In addition, North Carolina is using the stakeholder and public meetings associated with its basin planning process to build awareness and educate stakeholders on TMDL issues. However, not all states have embraced the more robust stakeholder involvement processes associated with the watershed approach into their

TMDL programs.

The more intensive monitoring and basin assessments associated with a watershed approach and requirements under the TMDL program can provide synergies that are mutually beneficial. States that have been able to increase data collection and improve basin assessments through their watershed approach report benefits to their TMDL programs (e.g., information that aids in listing, de-listing, or modeling specific waterbodies). In addition, TMDL-based monitoring and assessment activities provide information to both the watershed and NPDES programs, improving their analytical potential.

#### **D. NPDES Permitting**

- **Almost all of the states under review have NPDES permitting programs that are involved in statewide watershed management.**

NPDES permitting or point source control programs have traditionally been the driver of the statewide watershed approach. Many states initiated their statewide watershed management approaches in an effort to make their NPDES permitting programs more efficient and better integrated with their monitoring programs. In fact, some states developed basin management boundaries partly based on the location, re-issuance cycles, and relative workload of point sources or NPDES permits within their states.

Seven of the eight states are issuing or plan to issue NPDES permits according to basin or watershed management areas (e.g., Oregon's program is driven by TMDL schedule only). Six states re-issue their NPDES permits according to a 5 year rotating basin schedule (e.g., New Jersey issues permits by basin area but not according to a rotating schedule). Four of the seven states are only in the first round of permitting according to the 5 year rotating basin cycle (i.e., Kentucky, Massachusetts, New Jersey, Texas). As a result, these states were able to provide only limited information about the experience, benefits, and challenges of basin-wide permitting. Washington is in the second round of permit issuance whereas North Carolina and Ohio are in their third round of the basin cycle. Massachusetts is the only state among the eight reviewed in the study that is not authorized by EPA to implement the NPDES program.

- **Basin-wide NPDES permitting can result in a more strategic and efficient permitting program, greater stakeholder involvement, and more effective and equitable permit limits.**

State permitting managers suggested that basin-wide permitting has had a number of positive impacts:

- (1) Basin-wide planning process provides an effective organizing function for all stakeholders to focus on a myriad of water quality issues. It provides communities within a basin with a process and a timeline to address water quality issues. For example, Ohio's effort to integrate basinwide planning

with the NPDES permit process has helped gain community support for implementation issues and it causes dischargers to consider the entire watershed.

- (2) Basin-wide public hearings for groups of permits enhances program efficiency and public participation. State permit managers maintain that it is more efficient to have one large, longer meeting for a subwatershed rather than numerous smaller hearings on individual permits. Public meetings for groups of permits helps focus the public and permitting groups' resources on addressing the most important water quality issues within the basin or watershed.

- (3) Basin-wide permitting encourages dischargers to work together to develop more effective and equitable permit limits. The basin planning process allows permittees to compare their permits with other dischargers in the same area and this helps set permit limits that are more equitable. For example, in North Carolina the process has facilitated the formation of NPDES discharger coalitions to determine the most equitable approach to reducing loadings. In several states, NPDES permits have been written so that dischargers must cooperate in finding the causes of impairment in a watershed.

- (4) Basin-wide permitting has made the permitting program more strategic and planning oriented. *First*, permit writers often work as part of a team and consult regularly with other water quality staff. By assigning permit writers coordination roles for basins, it has helped make them more knowledgeable and involved in all aspects within a basin (i.e., other dischargers and permit limits, monitoring data, sources of impairment, etc.) *Second*, the basin-wide monitoring and assessment process has resulted in better and more comprehensive wasteload models which results in better and more effective limits for permits. More stringent standards and limits can be put in place for basins that are deemed to be under severe stress. It has also helped to recognize the importance of other stressors, like non-point sources, in contributing to water quality problems. As a result, permits are being evaluated more holistically in terms of the watershed. Some state permit managers hope that this could lead to watershed-based permits in the future. *Third*, before the basin cycle approach, NPDES minors were more or less ignored in some states. In some basins, however, minors were suspected of having worse impact on water quality than major dischargers. Under the basin approach, several states are now able to monitor minor dischargers more often and there is a better knowledge of their condition.

- **Many states have struggled with issuing all NPDES permits within specific basins according to the 5 year rotating basin schedule.**

Basin-wide permitting has resulted to some extent in an increase in expired permits in some states as they attempted to adjust their permitting programs to the 5 year cycle. This is especially the case during the first 5 year or "transition" cycle of the approach. Key barriers and challenges that prevent states from implementing their NPDES permitting programs according to the 5 year cycle are:

- (1) Uneven permitting workload across basins. Dischargers are not distributed evenly across most states. Some basins have no point sources while other may have a large number.

- (2) Special federal initiatives and new programs divert resources from basin permitting cycle. For example, up until 1997, most of Ohio's permits were on the 5 year cycle. In 1998, the Great Lakes Initiative took time and money out of the normal permitting process and, as a result, some Ohio River and Lake Erie permits - representing about 10-20 percent of the total permits in the state - do not follow the 5 year schedule.
- (3) EPA and court-imposed TMDL schedules and review process. The TMDL process is causing some problems with issuing permits according to the 5 year basin schedule in some states (e.g., Ohio). States now have the additional task of recalculating permit limits to fit the TMDL process. Some states are finding that this often cannot be done within the 1-2 year time frame allowed for implementation within the basin cycle. For a state like Oregon where the watershed approach is TMDL driven, permit reissuance is based entirely on the TMDL schedule. It has been a year and a half since the schedule was developed but following it has been spotty. Some permits are up for renewal in watersheds where TMDLs will not be done any time soon. Since there are not many TMDLs done yet, this has resulted in a serious backlog in permit reissuance.
- (4) State laws limiting permit terms. Texas has a law that prohibits its NPDES permitting agency from issuing permits with terms less than two years. This makes it more difficult to bring permits into sync with the basin cycle because the state is restricted in using short-term (one year) permits as a means to coordinate permit re-issuance with the cycle..
- (5) Pressure from regulated community to address permitting issues when needed. In Texas, despite a state law that requires all permits within basins to be issued in each basin within the same year, some permittees have been unwilling to "wait their turn." State permitting staff find that major dischargers are unwilling to postpone facility expansions or alterations so that their permits will be in sync with other permits within the basin. Such requests are usually dealt with on an "as needed" basis. As a result, major dischargers, unlike minor industrial facilities and municipalities, are less likely to be on cycle as their applications are given priority for processing and they tend to expand more often than minors. State managers estimated that about 50-70 percent of permits have expiration dates that corresponds to the basin cycle plan.
- **State permitting managers have adopted a number of approaches to help their programs stay on the 5 year rotating schedule.**

Sometimes adjustments have to be made to basin and/or permitting schedules in order to meet the 5 year time frames. State efforts to address this problem have included primarily two approaches: *prioritizing permit issuance and/or adjusting permit terms as needed.* For example, North Carolina developed an expedited permit renewal prioritization process whereby permits within a basin were given a point value based on the complexity and average amount of time it would take to issue the permit. Other states have issued short term permits, as needed, to keep to the 5 year basin schedule. Some states have issued 3 or 4-year permits if permits were issued later than the schedule required

(e.g., development of new nutrient criteria), and let some permits expire when there was only one or two years left until the scheduled basin permitting date. Finally, a few states split up the NPDES cycle in some basins and make adjustments so that permits within the basin are not issued all together. When permits come up for reissuance before or after a cycle, a state will issue administrative approvals for off year permits with a public notice. *Almost all states agreed that the CWA and EPA rules should be amended to allow states the flexibility to issue permits for longer than five year terms (e.g., 7, 8, and 10 years permits were discussed).*

#### **E. Nonpoint Source Control and Management (CWA Section 319)**

- **Although state 319 nonpoint source programs are often used as a source for funding local watershed protection and restoration, they are often not fully integrated into statewide watershed management approaches.**

Clean Water Act 319 nonpoint source funds are an important source for water quality protection and restoration at the watershed level in all states, but most states have not completely folded their 319 programs into their basin planning processes. Most states have retained the programmatic ability to respond to and/or address nonpoint source pollution problems across the their states based on need or priority of specific project proposals or watersheds. Only three states admitted (e.g., Kentucky, Massachusetts, and New Jersey) giving “bonus points” or a higher priority to 319 project proposals that were included in a basin/watershed plan or strategy. These states have also attempted to coordinate funding 319 proposals with the implementation phase of a specific basin’s management cycle.

State managers suggested that there were several key reasons for the limited integration of the 319 programs into their statewide watershed approach. First, there still tends to be a “point source bias” to the statewide approach. Historically, many states developed their basin boundaries partly based on the number of NPDES permits in each basin and on the permit review workload. There was a heavy emphasis during the first round of the rotating basin approach on making sure that point source dischargers were dealt with first. In addition, one state manager thought that it was inherently easier to address point sources under a basin cycle than nonpoint sources. He argued that: “There is a fundamental difference in having a cyclic, basin-oriented, NPDES regulatory permitting program for a couple of thousand dischargers versus a mostly non-regulatory, noncyclic, decentralized approach to addressing hundreds of thousands of nonpoint sources.” Second, as mentioned earlier, most states admitted that there has been limited coordination between states-sponsored basin management and locally-driven watershed planning. Many of the latter planning efforts tend to focus more on non-point source issues and are lead by local government, non-profits, and/or agricultural authorities (e.g., Natural Resource Conservation Districts) which up until fairly recently have had limited involvement in state-sponsored water quality planning at the basin level.

- **State 319 programs are becoming increasingly drawn into the sphere of TMDL**

## **activities.**

States cite implementation of TMDLs – especially TMDLs that deal with nonpoint sources of pollution – as one of the most challenging aspects of the watershed approach. Even when state nonpoint source programs are closely tied to a statewide watershed approach they tend to be drawn into the sphere of TMDL activities where waterbodies are listed as impaired primarily to polluted runoff. The movement to funnel a significant portion of state 319 funds to use-impaired waters and TMDLs was almost universal across the states and reflects both the overwhelming need for cost-share and other funding to address nonpoint source-related TMDL issues and the lack of significant levels of such funding from other sources.

A number of states award priority points for 319 proposals addressing water quality issues in 303(d) listed waters. This may, however, present problems for states that have adopted a rotating basin approach. For example, some states are struggling with setting priorities and distributing funds according to their list of impaired waters and keeping to the five year basin schedule. Impaired (303(d) listed) waters are often disproportionately distributed among state-designated basin management units. As a result, it can become difficult for state managers to synchronize funding for non-point source projects and development of TMDLs according to a five year schedule.

- **Most states maintained that the structure of the section 319 program is not always amenable to state watershed planning and assessment activities.**

Although recent restructuring by EPA to make the 319 grant process more flexible was widely seen by states as an improvement, states would like further changes to 319 grant guidance that would allow them to target resources more effectively toward basin and watershed priorities. First, since states and watersheds vary widely in the type of activity that is needed, more flexibility is needed on how much can be spent on assessment and implementation (e.g., current guidelines require states to devote 20 percent for planning/development and 80 percent for implementation activities from 319 incremental funds). Some states thought that the current guidelines should be revised to focus more on capacity building within watersheds for nonpoint source pollution monitoring, preventative outreach, and developing options for best management practices. For example, Ohio staff noted that developing a TMDL for a waterbody impacted primarily by nonpoint sources would require only planning and development initially; implementation funding could wait until after the TMDL was calculated, developed, and approved. Some states thought a better 319 process might be to implement a case by case funding split for planning and implementation funds.

Second, some state managers thought that the 319 grant guidance focused too much on imminently threatened waters and already-impaired waters, as opposed to keeping high quality waters healthy. States thought that it was not only important to address threatened waters but also to build a strong prevention program to protect pristine watersheds. Finally, one state NPS manager argued that the requirement for a 40 percent match to federal 319 funds is often difficult for project partners at the

subwatershed level. Many states, however, are addressing this problem by making other state funds available to cover the 319 matching requirements (e.g., Massachusetts, New Jersey, Ohio, Washington).

## F. Safe Drinking Water Act Programs

- **State drinking water programs are only marginally involved in statewide watershed management programs.**

In nearly all of the states visited, state drinking water agency staff cited few examples of involvement with their state's watershed management program. States cited several administrative and programmatic reasons for the disconnect:

- Administrative barriers. U.S. EPA and state environmental agencies often place water resource and watershed management programs in a different division than their drinking water programs. In some states (e.g., Oregon, Washington) the state health department oversees drinking water programs. The historical separation of drinking water related public health issues from more ecologically based water resource management concerns persists to some extent even when the drinking water management unit is within the water resource agency (e.g., Texas, New Jersey, Ohio).

- Programmatic barriers. With the notable exception of the 1996 SDWA amendment requirements for source water assessments and protection plans, state personnel saw little overlap in the major SDWA and CWA programs. First, state staff noted that the SDWA focused on maximum contaminant levels in potable water, while the CWA focused on water quality standards for raw water – two completely different (though arguably related) approaches. Second, the two programs traditionally have not shared the same concerns for the same stressors (e.g., phosphorus, sediment, bacteria, hydromodification). Third, some states thought that integration of CWA and SDWA programs are becoming more difficult – especially since the CWA programs are becoming more driven by TMDLs. One state staffer argued that the SDWA programs were broad and more focused on protection, while TMDLs were very narrowly focused and stressed remediation.

Most drinking water agency staff noted that their programs were underfunded and facing new mandates annually from U.S. EPA, leaving little time for participating in watershed programs.

The watershed approach, however, is bringing the disconnect between the federal drinking water standards and ambient water quality standards to the forefront (e.g., appropriateness of criteria and how they are applied). Although states are trying to work the problem out at the state level, some say they lack the flexibility to make ambient water quality criteria under the CWA less stringent when it is necessary.

- **SDWA source water assessment requirements represent significant opportunities for integrating clean water and safe drinking water programs.**

Cooperation and collaboration among state drinking water and water resource agency programs under the source water assessment and protection requirements ranges from very strong to very weak among the states visited. For example, in Oregon, the Department of Environmental Quality and the Department of Health jointly assess surface waters and complete potential hazard inventories for whole watersheds (i.e., Oregon designates the entire watershed as the source water area, rather than just 10-15 miles upstream) as part of source water assessments. On the other hand, in Washington and North Carolina, state managers stated that there is little interaction between agencies responsible for watershed management and drinking water beyond ad hoc cooperation at the field or project level. State drinking water agencies often pass the requirement for source water assessment and protection plans along to regional or local water utilities, which sometimes approach basin coordinators or statewide watershed management programs for assistance.

Most state drinking water and water resource agency staff interviewed appeared cognizant of the logic in linking SDWA and CWA program requirements, especially in light of the 1996 SDWA amendments. Operationalizing the concept of collaboration has been difficult due to the historical and administrative issues noted above, but states are continuing to explore ways to do it. In North Carolina, for example, local government water utilities have become more involved in the basin planning process and have accessed and used information collected during the basin assessment phase for source water identification and assessment. More collaboration is expected, but the approach is still under development. In New Jersey, the Bureau of Safe Drinking Water is coordinating with the state water resource agency on broad water supply issues, but has not involved their sister agency in the source water assessment process. The Bureau, however, is becoming more involved with local watershed groups, uses the same watershed management areas and GIS mapping program for planning as the water resource program, and forwards issues to watershed teams for action.

#### IV. CONCLUSIONS

- **State managers and staff are overwhelmingly supportive of the statewide watershed management approach despite a number of programmatic and institutional barriers.**

Roughly 80% of state respondents said that their experience with state watershed approach has been positive to very positive. Furthermore, support for the approach was fairly consistent across all state participants including state directors, program managers, basin coordinators, and non-profit representatives. Most believe the approach resulted in significant improvements in program management (e.g., better data, improved capability for developing TMDLs, and more efficient and equitable NPDES permitting), interagency coordination, and enhanced public involvement. More important, despite all the constraints, barriers, and problems mentioned by state managers and staff during the course of the study, almost no one regretted adopting the approach or wished that they could return to their previous management approach.

The overwhelming support for the statewide watershed management approach by state managers and staff is a significant conclusion for the study and cannot be emphasized enough. This demonstrates the strong commitment these states have to the watershed approach and their willingness to work across state and federal agencies boundaries to make the approach more effective. Consequently, these states represent a tremendous resource for EPA headquarters and regional offices to draw on for making the necessary policy and organizational changes that are needed to institutionalize the watershed approach among its regulatory programs. For example, state facilitated basin/watershed planning processes represent significant opportunities for EPA efforts to integrate CWA and SDWA water quality program requirements. In addition, basin planning could serve as a solid foundation for reviving the 303(e) continuous planning process as a vehicle for fostering greater integration across water program elements.

- **The key to a successful statewide watershed programs appears to be one that recognizes the important value of inter-agency and state-local partnerships and is supported by an adequate coordination infrastructure.**

Statewide watershed management by definition cannot be conducted by a single agency. It requires partnership among agencies and a means for working together (i.e., an agreed upon framework and a steering committee to administer). Time and resource constraints are less of a problem when agencies and organizations are pooling their resources to accomplish the same goal. States need to make sure that their watershed frameworks include all the necessary elements (i.e., statewide committees, basin coordinators, basin teams, and basin plans) and partners (e.g., local, state and federal) for implementing the approach. State water quality agencies should not attempt to go it alone without sharing some of the authority and responsibilities for watershed or basin management. States which have formal basin coordinating committees or teams appear to be more effective in maintaining accountability and buy-in

from state agencies for water quality goals than states that rely only on basin coordinators or watershed team leaders.

Although the study found that most statewide watershed programs have been largely unsuccessful in integrating local government authorities and priorities into their basin planning process, some states are beginning to build partnerships with local leaders that support key water quality management goals and objectives. The latter states are moving from a top-down, programmatic watershed framework to a more bottom-up, locally driven approach. Some state agencies have been making this shift on their own (Massachusetts, New Jersey, North Carolina) while other states are being pushed by state legislation (Washington, Texas). This recent trend is not necessarily toward decentralization, however, but toward building strong and effective partnerships. In the past, the opportunity for leadership was frequently missing at the local level for management actions on the ground, and opportunities to leverage technical and funding resources with other state and federal agencies largely went untapped. States are now realizing the importance of local leadership and planning in achieving implementation of effective watershed management. Although statewide frameworks are very much needed to provide basin-scale assessments, comparison of risks to water quality protection across the state, and coordination and leveraging of state and federal programs, state agencies are reluctant to prescribe actions best taken at the local level (e.g., land use regulations and BMP implementation). Rather, the trend is to partner with local governments and associations such that the state and federal partners provide large-scale goals, technical assistance, and funding, while the local partners emphasize design and oversight of implementation strategies. States that start out with a basic framework for implementing their watershed management approaches and then adapt them as needed to respond to local concerns, resources, interests, seem to be more effective. On the other hand, states that pigeonhole the “watershed approach” into a strict five step/five year bureaucratic exercise are restricting their management options. In sum, statewide and local frameworks are both needed for an effective watershed management approach.

- **The rotating basin approach to statewide watershed management should be viewed as a framework for focusing resources and coordinating activities and not an end in itself.**

Many states that have adopted the most common form of statewide watershed management - the 5-year, 5-step rotating basin approach - complained that they often had difficulty completing their core water program activities within the time frames of basin management schedules. For example, managers of TMDL and NPDES permitting programs said that in many cases they could not develop all their TMDLs or issue all their permits within a one-two year time frame in some of their state’s basins due to the large number of impaired waters or dischargers. As a result, they could not keep up with the 5 year cycle and implementation in some basins fell behind. Other programs, such as ambient monitoring, indicated that although they generally were able to conduct extensive monitoring within basins according to the prescribed time frame, they sometimes found it politically difficult and environmentally imprudent to “ignore” some basins for up to 4-5 years until the beginning of the next cycle. Furthermore, states often blamed EPA or statutory schedules and reporting requirements - such

as the 5 year time frame for reissuing NPDES permits - as a major factor in hampering their efforts to abide by the rotating cycle.

EPA and states have basically three choices in addressing the basin scheduling problem. First, states could abandon attempts at establishing management schedules within basins and instead conduct program activities according to each program's priorities. States argued against this idea, however, and asserted that experience shows that the lack of a schedule turns the management process into a "black box" where participants no longer know when a focus of activities will be occurring. This results in inefficient use of resources, lack of coordination, and disengagement by stakeholders from the management process. The advantage of the five year planning cycle is that it allows all participants to know far in advance when certain activities will be occurring and identifies opportunities for leveraging and sharing of resources.

A second approach would be to amend the Clean Water Act to synchronize all programmatic and reporting schedules on a 5 year cycle. EPA headquarters staff argued that it would not be feasible at this time nor even desirable to open up the CWA re-authorization process for a wholesale revision. In addition, some program activities (triennial review for standards, biennial reporting on state water quality) are best done within a shorter time frame to keep up with technological and environmental changes. On the other hand, EPA and states should work together to streamline program and reporting requirements wherever appropriate to synchronize them with basin schedules.

The third and more practical approach to resolving the perceived conflict between the basin cycle and programmatic requirements would be for states to recognize the limits of the 5 year rotating basin cycle and its relative importance to the watershed approach. Many states appear to be taking the cycle more seriously than was originally intended. *It is not an end in itself nor should it be viewed as the most important criterion for a state's adherence to the watershed approach. The rotating basin approach should be viewed as merely one possible means or tool for focusing state resources and organizing collective and coordinated efforts where it makes sense to do so across state agencies at the basin or watershed level.* It should be viewed as a dynamic and ongoing process that when used wisely is adaptable to changes in resource demands and environmental events. For example, states that complain that they cannot complete implementation or other management activities within the 1-2 year time frame of a five year cycle need to recognize that activities need only be initiated within these time frames and not completed. Implementation is ongoing and should be periodically reshaped and adapted as needed when basin plans are updated or modified. In fact, states should consider their implementation of the rotating basin approach successful if they are able to focus up to 70% to 80% of their resources and activities according to the basin cycle. States need to identify and find appropriate ways to manage those water program activities - such as nonpoint source controls - that may not fit the five-year cycle approach.

- **EPA needs to focus more resources and attention on improving federal-state oversight and building state watershed management capacity as part of its strategy to support**

## **the watershed approach.**

Over the past ten years, EPA has devoted a considerable amount of resources to promoting the watershed approach. There are numerous efforts at EPA headquarters and regional offices that provide grants, assistance, and training to local organizations to help them develop the tools they need to effectively adopt the watershed approach. The Watershed Academy provides an array of publications and training opportunities for state and local representatives on watershed tools and practices. Furthermore, EPA headquarters offices have provided over a million dollars worth of training to states over the past decade on developing statewide watershed management frameworks.

Unfortunately, many states feel that EPA has not demonstrated enough support or sensitivity to state watershed management in its rules, policies, and oversight. First, some states argue that EPA has largely failed to address impediments to the watershed approach by continuing to focus on program-specific initiatives. For example, states feel that EPA too often becomes fixated on a particular initiative or program element from time to time. It could be the permit backlog one year, or the Clean Water Action Plan the next, or TMDLs at the current time. As a result, EPA appears myopic and fragmented rather than consistent and integrated in its policy and implementation decisions. States maintain that this makes it difficult to sustain an integrated, watershed-based approach to managing water quality programs over the long-term. Second, several states noted that EPA headquarters has significantly cut back its support in recent years for facilitation training on developing statewide watershed management frameworks. This may have had a negative impact on expanding the statewide watershed approach beyond the roughly twenty states that have adopted the approach so far. Finally, some states staff thought that EPA's watershed approach is directed mainly at watershed-specific projects and not at statewide programs. In many instances, they maintained, federal guidance and support is directed at local watershed communities based on the assumption that no statewide watershed program exists.

In promoting the watershed approach, it appears that EPA's regulatory framework and oversight of state programs has not kept up with its non-regulatory support for local watershed efforts. While support and information-sharing on local watershed efforts has gradually increased in recent years (e.g., Watershed Assistance Grants, National Watershed Forum and Regional roundtables, Watershed Initiative), efforts to build states' capacity for adopting and supporting the watershed approach has declined. Although more EPA support for statewide watershed facilitation training is needed, EPA should go beyond simply providing training to states and should identify and eliminate the constraints that its rules, policies, organizational structures, and oversight practices pose to state watershed efforts. Watershed training and technical assistance will result in only modest gains as long as the programmatic environment states have to work in continues to be guided by a fragmented and inconsistent approach to federal oversight.

- **EPA and states need to begin documenting the resource and environmental gains attributed to the statewide watershed management approach.**

One of the most important questions to ask about any government management effort is: Has it been successful in achieving its objectives or fulfilling the claims of its advocates? In other words, does it work? Despite all the efforts EPA and the states have put into adopting and implementing statewide watershed management over the past ten years, there have been few attempts to evaluate and document the approach's impact on agencies' resource savings or states' water quality (for description of states reasons, refer back to page 16). Too much of the literature on statewide watershed approach is based on anecdotal information or the perceptions of state managers and staff responsible for carrying out the approach. None of the eight states involved in this review had attempted to undertake efforts to evaluate the effectiveness of their approaches.

One of the most consistent arguments for adopting the statewide watershed approach during its early days was that it was viewed as a more efficient way for state agencies to manage their resources. While there have been a several claims made in some states that the watershed approach has enabled a program to undertake more tasks with the same or fewer resources (i.e., 25% increase in monitoring), these claims tend to be anecdotal or unsupported by any systematic analysis. During the course of this review, many states complained that they lacked the necessary resources to effectively implement the approach. If the original intent of the approach was to make state water programs more efficient, where are the resource gains that have occurred due to the approach? Unfortunately, none of the states have done a recent cost effectiveness assessment to document any gains in resource or workload efficiency.<sup>2</sup>

Furthermore, state have been unable to provide data that directly links the statewide approach to waters quality gains. Although many states can demonstrate that water quality within their states has improved over the past ten years, it is unclear that this can be attributed to the watershed approach. Too many states' watershed approaches appear to have neglected the final step in the 5 step basin cycle: adaptive management. It is not clear if states have developed the necessary indicators to measure change by basins or watersheds and relate the change back to management actions. More work needs to be done to incorporate water quality indicators into basin plans, track and monitor them over time, and make management changes in response to success and failures. Until this is done, the overall efficiency and effectiveness of the statewide watershed approach will still remain uncertain.

Finally, the lack of efforts to develop and track measure of success for the watershed approach is troubling especially considering the concern many state managers expressed regarding the level of support from state political leaders for the watershed approach. Without clear, hard evidence that the

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<sup>2</sup> It is possible that the watershed approach has allowed states to do more work with the same resources but the approach has identified more problems, created additional work, brought more stakeholders and partners into the process, raised more public awareness and expectations and demands on states agencies. States that have not adopted the approach may have less information and fewer problems identified.

statewide watershed approach is producing short-term and long-term results, state managers may be unable to effectively obtain management and public support for the approach and the necessary resources associated with that support. States that are in the early phases of their approach should be developing management and water quality indicators now so that they will be able to demonstrate trends and make adjustments over time to improve their management approaches.

## V. RECOMMENDATIONS

### A. Recommendations for EPA

EPA should work with states to adopt and implement the following recommendations:

- **Promote key elements of statewide watershed management approaches by senior EPA management.**

Support for statewide watershed management needs to start at the top. Every opportunity should be made by the Agency senior management to communicate support for the approach during state program review/oversight meetings, development of Performance Partnership Agreements, and EPA and state national water program meetings. EPA should encourage states to adopt key elements of statewide watershed management that would help integrate the implementation of their water program activities around the basin and/or watershed level. This would include actively promoting monitoring, water quality assessment and criteria development, planning, and implementation of point and non-point source controls at the basinwide or watershed level. In addition, EPA should reduce disincentives for states in adopting innovative approaches that support and/or build on watershed management such as: watershed-based TMDLs, NPDES permits, and effluent trading.

- **Provide information, training, and incentives to assist states in adopting statewide watershed management approaches.**

Information. (1) EPA should provide information on potential solutions to problems that states are having in implementing their watershed approaches. Formats could include website access to outreach and technical assistance. Proposed solutions should address a myriad of issues including information management, balancing permitting workloads, and incorporating historically neglected programs. (2) EPA should revise and reissue its 1995 guidance on statewide watershed management (*Watershed Protection: A Statewide Approach*, EPA 841-R-95-004) based on state experiences captured in this study. The document should include a set of case studies on how states are managing their watershed programs. In addition, the document should publicize examples of successful integration of CWA programs at the watershed level. Among these should be one's reflecting states' integration of TMDLs and watershed strategies.

Training. (3) EPA should continue to provide more funding for statewide watershed management facilitation workshops. The agency should explore ways to significantly expand training programs for EPA and state agency personnel. This expansion should encompass not only a widening of the topics covered by available training, but also greatly enlarged delivery capacity for live training.

Incentives. (4) EPA should provide incentives and flexibility for states who haven't already adopted statewide watershed management approaches to initiate institution building and experimentation. Incentives could include more flexibility in oversight of program requirements, more resources for watershed/basin planning and management, and more technical assistance for framework development and trouble shooting.

- **Work with states to investigate and develop solutions to barriers to statewide watershed management.**

State experiences show that even those states that have adopted the approach many years ago continue to struggle with it. Some of the barriers are state-related while others may be due to EPA program policies and oversight practices. EPA needs to demonstrate that it plans to address some of the barriers to state watershed management. Options include:

(1) Holding workshops or other discussion forums with state agency officials to share information on watershed approaches, evaluate and discuss problems and issues, and develop solutions. Face-to-face workshops would help ensure that states' perceptions of EPA's positions on various issues are consistent with EPA's own understanding, and to identify actual, rather than perceived EPA barriers;

(2) EPA should develop a strategy that would assess the existing list of perceived barriers, address priorities on the list, follow through on the strategy until solutions are adopted, and communicate the changes to the states.

(3) EPA should establish a position in its headquarters office for a full-time statewide watershed coordinator/liaison/evaluator. Key functions for this position would include: liaison with EPA regions/states/state associations/other water programs on statewide watershed management approaches; advocate for the approach at national meetings; and, performing outreach by developing and distributing materials on statewide watershed approaches. The position would also be responsible for analyzing and evaluating problems and solutions, and developing and overseeing funding proposals for training on framework facilitation.

(4) Once barriers to statewide watershed management are identified, EPA should make a concerted effort to revise its programs, rules, and policies to make them more consistent and supportive of watershed management approaches (i.e., TMDL rule, CALM, SRF, 319 guidance).

In addition, the agency should assess options for revising core water program schedules and reporting requirements to be more consistent with 5 year rotating basin cycle.

(5) Develop and implement a concerted communications strategy, aimed primarily at state water agency management and staff, to clarify that EPA does not believe that adhering strictly to any particular management schedule, be it the 5 year/5 step version or another, is a critical factor in statewide approaches to watershed management.

- **Become more actively involved in state watershed planning and implementation.**

A number of state managers and staff complained that EPA is not as involved in statewide watershed management as much as they should be. EPA's involvement, states argued, would provide the necessary political, policy, management, and technical support that states need at the basin or watershed level. By participating in basin planning discussions and activities, EPA will demonstrate its support for the watershed approach, better understand the issues and challenges facing states and its partners, and can help build trust at the state and local levels. To facilitate its involvement, EPA should revise the ceiling on travel expenditures so EPA staff--especially in the regions--can become much more involved in local watershed partnerships. EPA headquarters should provide the appropriate travel resources for Regions to effectively participate in statewide watershed coordination meetings and specific basin planning key events.

- **Review and revise resource allocations to states to promote integrated watershed management.**

EPA should investigate constraints imposed by its funding mechanisms on state watershed approaches and develop options that allow states more flexibility to implement their regulatory programs and target resources on a basin and watershed level. EPA should use funding programs under the authority of the Clean Water Act (i.e., sections 104(b)(3), 106, 319) to support state efforts to experiment with tools that improve program integration and create holistic watershed strategies, of which TMDLs for impaired waters are only one element.

- **Develop a management infrastructure at the headquarters and regional levels that supports greater integration and coordination of CWA and SDWA programs at the basin/watershed level.**

A key finding from the study was that EPA needs a more flexible, integrated, results-driven approach to its oversight of state water quality programs. EPA can achieve this goal by considering the following options:

(1) The national water program should promote and support a management infrastructure that consist of three levels: locally-driven watershed management frameworks to lead management action design and implementation; statewide frameworks to support basin assessment and planning; and a federal framework to develop national policy and address interstate and international coordination. The lynchpin for the three levels should be the state-sponsored basin or watershed planning process. EPA should provide whatever support it can to integrate water quality program standard development, planning, assessment, implementation, and reporting functions and requirements within watershed and/or basin planning processes. Specifically, EPA and states should promote greater collaboration and coordination of watershed and/or basin management and source water assessment and protection plans as best opportunities for integration of SDWA and CWA authorities.

(2) EPA regional water program officers should consider developing organizational options that

support greater integration in its oversight of state water programs that have adopted a statewide watershed approach. Some examples might be the establishment of cross-program committees or state-based teams with representatives from each of the core water program areas (e.g., 319, 305b, TMDL, NPDES, etc). Key functions of the team or committees would be to establish strategies that coordinate program requirements, initiatives, and state oversight on a basin/watershed level and participate in statewide watershed activities to better understand the issues and activities at the basin/watershed level. The teams could be useful in demonstrating EPA's support for the watershed approach, and building working relationships with state personnel in the watershed approach context. Ideally, each state team would be chaired by someone with enough experience to understand the big picture regarding how each of the programs fit within the context of a watershed approach and have sufficient authority to make policy and implementation decisions.

(3) EPA headquarters and regional offices should develop protocols for assessing proposed rules and guidance to determine potentially adverse impacts on statewide watershed management. In addition, EPA should identify and eliminate, if feasible, barriers to state watershed management within current Agency rules and guidance.

(4) EPA and states should work together to develop performance measures under the Government Performance and Results Act that promote integration and linkages among CWA and SDWA programs. In performance partnership agreements and guidance on the use of various EPA funds, the agency should place more emphasis on environmental results, and less on programmatic outputs and measures.

## **B. Recommendations for States**

States should consider adopting several key actions to improve their watershed approaches:

- Evaluate whether their watershed management frameworks have the necessary components that facilitate resource leveraging, program integration, and accountability. Some states are having problems getting other state agencies and stakeholders to actively participate in the implementation steps of their statewide watershed activities. In some cases, this is due to the lack of key elements in their watershed frameworks. States need to revise their frameworks to include on-going institutional structures - such as basin teams or statewide steering committees - that facilitate resource and power sharing and accountability.

- Build greater support for the watershed approach at the senior management level (e.g., state commissioners) and with state legislatures. States should consider developing regulations and/or introducing legislation (with the appropriate resources) that codifies existing basin /watershed planning processes. This may help protect state water managers from unpredictable political changes and build public support for the approach.

- Improve the integration of more state programs into statewide watershed approaches. States vary widely in the number of state programs that are incorporated into state-sponsored watershed

approaches. Of the eight states reviewed, water quality standards, the State Revolving Fund, coastal and wetlands protection, and in some cases, non-point source programs were often not active players in the statewide watershed approach. These are all vital programs for water quality protection and restoration and each should be sufficiently involved. State water quality agencies need to include other partners from other agencies to make sure that non-point source issues are included in the watershed approach. In addition, states should find ways to integrate their water quality standards development process (administrative rulemaking procedures, public hearings, commission/legislative review requirements) with the planning and assessment elements of their watershed approaches (statewide coordinating committees, basin planning and assessment public meetings/workshops).

- Link state-sponsored basin planning with local planning and zoning efforts more effectively. Many states need to make a greater effort to integrate local government authorities and plans into their state/basinwide approaches.

- States that are considering adopting a statewide watershed approach should be flexible, patient, and committed. States should be flexible in designing statewide frameworks that are consistent with their state's legal, organizational, and environmental circumstances. States should be patient in implementing their approaches especially during the early stages. Learning will be an iterative process and it could take anywhere from 5-10 years for a state to complete its reorientation toward the watershed approach. And finally, state leaders need to be committed to providing the resources necessary to support the approach over the long term. In particular, states must maintain an adequate level of staffing support for statewide steering committees, local basin teams, and basin/watershed coordinators.

- EPA and states need some key indicators to track progress under the watershed approach. Too often the watershed approach can become an open-ended and expanding process that includes a growing number of state and local programs and activities. EPA and states need to work together to develop basin/watershed-specific and resource-based indicators (e.g., acres of waters, shellfish beds, submerged aquatic vegetation) to measure their progress in protecting and restoring water quality over the long-term. These measurement efforts need to be linked back to basin planning efforts so effectiveness of program actions can be evaluated and strategies can be revised, when necessary.

## **APPENDIX 1: STATE SUMMARIES**

## KENTUCKY

Kentucky has a combined natural resources and environmental protection agency at the cabinet level. Public health, agriculture, and the state fish and wildlife agency are all located in different cabinets. The Cabinet for Natural Resources and Environmental Protection contains nearly a dozen departments, commissions, and offices, including the Department for Natural Resources (DNR) and the Department for Environmental Protection (DEP). The DEP houses separate divisions for water, waste management, environmental services, and air quality. The divisions for conservation, forestry, and energy are located in the DNR.

The Kentucky Watershed Management Framework was developed in 1997 as a “way of coordinating existing programs and building new partnerships that will result in more effective and efficient management of the state’s land and water resources.” The framework established five basin management units and a statewide basin management schedule that cycles each basin through five management steps (scoping/data gathering, assessment, prioritization/targeting, plan development, implementation) on a staggered schedule. The Kentucky River basin kicked off the first cycle in 1997, partly because the physical operations of the Division of Water’s (DOW) central office are located within the basin. This first basin cycle is scheduled to begin the implementation phase in 2002.

The state’s watershed framework approach is guided by a steering committee composed of various internal/external stakeholders. River basin teams coordinate activities within the five management units, and local watershed task forces sprinkled throughout the basins work on issues at the subwatershed (i.e., 11-digit HUC) level. The Kentucky DOW has provided a full time watershed coordinator to manage the overall framework. Each basin management unit has a full-time coordinator hired by DOW or other agency to assist the basin teams and manage the five-step process. Basin teams sponsored by both the DOW and a nongovernmental organization have been meeting to identify key problem areas and develop outreach and remediation strategies for each basin.

Involvement in implementing the watershed framework varies across state agencies. Although there still exist some branches in the Division of Water that are not yet incorporated into the watershed approach, the key water programs (e.g., KPDES, 305b, 303d, NPS) have been folded in. External partners (e.g., fish and wildlife, agriculture, conservation, USFWS, USFS, TVA, NRCS) have mostly been involved in the scoping and data gathering process and basin team meetings. Although Regional office territories do not correspond to basin management units state managers did not view this as a problem and there are no plans to reorganize.

For more information about Kentucky’s watershed approach contact: Kentucky Division of Water. Phone 502-564-3410. Email: colten@mail,nr.state.ky.us

## MASSACHUSETTS

The Massachusetts Watershed Initiative is a partnership of local communities with state and federal environmental agencies, formed to more effectively solve today's environmental problems. The Initiative was established in 1993 as an effort to integrate the activities of the state environmental programs with each other and with the activities of federal and local governments, non-governmental organizations, business and other watershed partners. The goal of the Initiative is to facilitate locally based problem identification and problem solving and coordinate implementation activities among all parties. The structure and process of the Massachusetts Watershed Initiative has been in place for approximately five years.

A key feature of the Initiative has been the creation of multi-discipline watershed teams in each of the state's 27 major watersheds and the assignment of 20 full-time team leaders to coordinate activities of the teams. Each team includes representatives from local, state, and federal groups and is funded through various sources, including a state Watershed Roundtable that allocates state resources to priority projects identified by the team. By sharing resources, these teams find efficient regional solutions to problems facing their communities.

The watershed teams focus on an innovative five year management process that is designed to collect and share resources and information, target present and potential impacts to natural resources, assess impacts to natural resources, and develop and implement activities to protect and improve the Commonwealth's natural resources. Each year builds on the work of the previous year. Annual Work Plans are developed with active team involvement and serve as a guide for coordinating team efforts. Plans are the building blocks of the more comprehensive Five Year Watershed Action Plan. Action Plans influence state and federal grants and loans, regulatory decision-making, and educational/technical assistance programs to solve the most important environmental problems affecting communities. The teams are equally accountable to the Secretary of the Office of Environmental Affairs, a cabinet level secretariat reporting directly to the Governor, and to the community for the plans and deliverables identified in the plan.

For more information about the Massachusetts Watershed Initiative contact: Phone (617) 626-1000  
Web site: [www.state.ma.us/envir/](http://www.state.ma.us/envir/)

## NEW JERSEY

The New Jersey Department of Environmental Protection (NJDEP) adopted a watershed-based approach to water resources protection in 1997 when it published the *"Draft Statewide Watershed Management Framework Document for the State of New Jersey"* (January 1997). The statewide framework was based in large part on the lessons learned from New Jersey's watershed pilot project, the Whippany River Watershed Management Project, which was initiated in October 1993, and incorporated many of the elements from EPA's 1991 publication on the watershed-based approach. In November of 1998, the Division of Watershed Management was created within the NJDEP. The Statewide Watershed Management Program is administered by NJDEP's Division of Watershed Management as a coordinating framework for comprehensive watershed planning and management.

The New Jersey Statewide Watershed Management Program emphasizes that the primary objective of water quality and watershed management planning is, wherever attainable, to restore, maintain, and enhance water quality, water quantity, and ecosystem health. It serves as a coordinating framework for integrating surface and ground water quality standards and assessments, antidegradation, TMDLs, and water quality maintenance in wastewater and watershed management planning. The Statewide Watershed Management Program conducts regional water resources planning at the watershed management area scale and integrates water resource protection measures and land use development scenarios on a watershed basis in order to achieve water resource objectives. The Watershed Management Program promotes a collaborative planning process where the watershed community participates in the development of effective strategies to address water quality, water quantity and ecosystem health issues and achieve the desired results for a specific watershed management area. Through the Statewide Watershed Management Program, watershed management area plans are being developed as dynamic and flexible planning tools, consisting of certain minimum elements and also incorporating watershed-specific components. Watershed management supports the integration and coordination of planning efforts across all planning levels (State, regional, county and municipal) and across Department programs (wastewater, water supply, and land use).

The state's watershed boundaries are delineated into a nested layer of watersheds, watershed management areas and water regions. The State's efforts focus mainly on the 20 watershed management areas (WMAs) which are nested within 5 water regional offices or bureaus. The water regions correlate roughly with USGS 8-digit hydrologic unit codes. Each region consists of between 3 and 5 watershed management areas. Each watershed management area consists of between 1 and 4 HUC 11 watersheds. Population densities were also factored into the watershed delineations. The state's initial plan was to complete a comprehensive characterization report, identify problem areas, and then begin to address the problem areas in each WMA. However, the approach was recently re-oriented instead around a results-based management concept that evaluates progress based on environmental measures and results rather than documents or penalties collected.

Water quality and resource protection and restoration efforts are implemented within each of the 20 watershed management areas according to a sequence of watershed management steps. These are: (1) initial planning and stakeholder involvement; (2) visioning and goal-setting; (3) identification and funding of projects to address known problems with known solutions; (4) targeted monitoring and data collection to fill in data gaps and identify root causes (and as needed for TMDL development); (5) strategy development (including TMDLs, open space acquisition, zoning changes and land use ordinances, nonpoint source BMPs, "track down and clean up", etc.); (6) watershed management plan and proposal development; (7) watershed management plan adoption and implementation; and (8) evaluation (including monitoring) and refinement.

The state is managing the development of WMA plans under contracts with lead entities in each of the WMAs. The lead entities serve as agents of the Department while the Division of Watershed Management oversees the planning process through the Statewide Watershed Management Program. Each state bureau has a team of contractors and staff that are responsible for the WMA. One person from the team is assigned as the education and outreach coordinator for the WMA. It is his or her responsibility, along with the contract entity, to encourage the formation of citizen committees so that work is coordinated with the public. The contract deadlines require WMA plans to be developed for all 20 WMAs by 2005. In 2001, NJDEP executed grant agreements with 16 lead entities to administer the watershed planning process and develop watershed management area plans for all 20 of New Jersey's Watershed Management Areas.

For more information about New Jersey's watershed approach contact: NJ Department of Environmental Protection, Division of Water Quality, 609-292-4543.

Web address: <http://www.state.nj.us/dep/dwq/>

## NORTH CAROLINA

North Carolina was the one of the first states in the country to initiate a statewide watershed management approach. The idea was conceived in the late 1980's by managers within the state Water Quality Section as a way to streamline its NPDES permitting program and integrate permit reissuance more effectively with water quality modeling at a watershed level. After several years of planning and preparation, in 1991, the Water Quality Section in the Water Quality Division of the Department of Environment and Natural Resources (DENR) developed a framework document that identified the process, roles, and responsibilities for implementing the state water quality program on a basin-by-basin basis. North Carolina divided the state into 17 river basins and tested out its watershed management approach first in several basins between 1991 and 1992. In 1993, the state began implementation of the approach for the remaining basins within the state. The first cycle of plans for all 17 basins was completed in 1998 and the state is now on track to complete the second cycle by 2003.

North Carolina's statewide watershed management approach is based on a five-year, rotating cycle of activities that culminates in a basinwide water quality plan. Basinwide water quality plans are prepared in the fourth year of the basin cycle by the NC Division of Water Quality (DWQ) for each of the seventeen major river basins in the state. Preparation of a basinwide water quality plan is a five-year process, which is broken down into three phases. The state uses the five year management cycle to coordinate the following activities: monitoring, modeling/assessment, 303(d) listing, TMDL development, water quality standards and classifications, nonpoint source planning (targeting of grants), national estuarine program coordination, development of NPDES wasteload allocations and permit limitations, and basin plan documentation. The state has attempted to slowly integrate these internal programs over the past 10 years as it learns the issues that arise in each round of the rotating basin approach. New information is learned with each successive plan and state managers maintain that it takes time to understand the sources of water quality problems and integrate and manage state and local resources to address them.

The basinwide planning process is coordinated out of the Planning Branch within the Water Quality Section of the Water Quality Division. The state Division of Water Quality has four planners responsible for coordinating the development of seventeen basin plans. Planners must follow an internal review process that includes developing a time line and map, pulling together sampling data for the assessment report, developing general and specific recommendations, and identifying a matrix of staff in each water quality unit as basin leads for overseeing plan recommendations. The plan is revised based on feedback from the state regional offices that have program responsibilities within the basin before it is sent out for public comment. While basinwide plans are prepared by the DWQ, their implementation and the protection of water quality entails the coordinated efforts of many agencies, local governments and stakeholder groups in the state. The DENR, however, does not have any formal cross-office or cross-media to coordinate governmental planning and action across basins. The state

also does not have formal basin teams or steering committees consisting of multiple stakeholders to direct planning and decision-making efforts within basins. The DWQ uses ad hoc forums to present findings of the draft plan and solicit input from citizens and other local stakeholders. Public involvement in the planning process occurs during the following events:

- Local workshops: (Prior to the preparation of draft basinwide plans.) DWQ staff present information about basinwide planning and the basin's water quality. Participants can ask questions, share concerns, and discuss potential solutions to water quality issues in the basin.
- Public meetings: (After the draft plan is prepared.) DWQ staff discuss the draft plan and its major recommendations, seeking public comments and questions.
- Public Comment Period: (After the draft plan is prepared). The comment period is at least thirty days in length. Draft plans are made available on-line or by request.

The State Cooperative Extension Service helps organize public workshops and meetings in different locations in the basin. In a few basins, DWQ has established nonpoint source teams to try to coordinate activities of different agencies. On a "as requested" basis, the basin coordinators speak with interest groups such as professional organizations, local watershed associations, etc. After the public review process is complete, the plan goes to the Water Quality Committee of the Environment Management Commission for its approval. The Division of Water Quality is beginning to conduct workshops for the third round of the basin plans.

For more information about North Carolina's statewide watershed approach, contact: Division of Water Quality, (919) 733-5083.

Web site address: <http://h2o.enr.state.nc.us/basinwide/index.html>

## OHIO

Ohio's statewide watershed management approach evolved over a ten year period. Prior to 1990, much of the state's ambient monitoring program had been organized around a 5 year watershed management schedule. This allowed the state to sample smaller streams that had few or no permitted point sources and had never been sampled before. In addition, the Construction Grants Program in the 1980's placed a significant emphasis on basinwide plans. The grants program required states to demonstrate that there were water quality problems within basins and states needed to recommend a solution in order to get the funding. The comprehensive basin-wide water quality reports and resulting wastewater permits were a good way to satisfy that requirement. In Ohio, new development is usually concentrated around one of several major metropolitan areas. This resulted in a few basins being monitored intensely for some periods during the 1980s.

In 1990, the State of Ohio officially adopted a 5 year rotating basin approach that is similar to the North Carolina model. The state was divided up into 5 basins to reflect the 5 district offices across the state. The approach was initially started to support the monitoring and permitting programs. Ambient water quality monitoring and permitting are conducted out of the 5 district offices. State managers in the Office of Surface Water (OSW) realized the benefit of having monitoring data and comprehensive water quality reports available for streams with permits coming due and they set their permitting schedules to match when those reports were scheduled. In the early 1990s, permitting became part of the 5-year rotating basin plan. Permitting was originally based on priority, but it is now based on the 5-year plan. Some Ohio River and Lake Erie permits, however, do not follow the 5 year schedule. These account for 10 to 20 percent of the total permits in Ohio. The state has completed two 5 year cycles of the basin approach. The state has established 21 watershed coordinators throughout Ohio to guide watershed management efforts. They are jointly sponsored by Ohio Department of Natural Resources and Ohio Environmental Protection Agency mostly through 319 funds. The rotating basin plan is not written into any legislation.

Recently, the TMDL program has become the focus for basin planning. In 1999, The Division of Surface Water published a TMDL Team Report that represents their effort to reorient their statewide watershed management approach around the TMDL program. Their statewide watershed management strategy has been revised to reflect the increasing importance of the TMDL program. The state is attempting to develop TMDLs for all listed segments in each watershed at the same time. The state has had some problems, however, coordinating the priorities of the 303(d) listed impaired waters and the development of TMDLs within the basin cycles. One of the biggest barriers is that there are no local stakeholder groups available in some watersheds to coordinate efforts.

For more information on Ohio's statewide watershed approach, contact: Ohio Division of Water, 614-644-2001. Web site address: [www.epa.state/oh/dsw](http://www.epa.state/oh/dsw)

## OREGON

Oregon employs a multi-layered, multi-agency watershed approach utilizing a combination of voluntary and regulatory methods aimed first and foremost at one resource - salmon. Watershed activities in Oregon are supported by two state-sponsored efforts: the Oregon Plan for Salmon and Watersheds and the Governor's Watershed Enhancement Board.

The overall principles for watershed management are contained in the "Oregon Plan for Salmon and Watersheds" adopted in March 1997 by the state legislature. The Oregon Plan, formulated by the Governor, acts as the key strategic driver of watershed activities within the state and serves as an umbrella for the various agencies and citizen-led efforts to support natural resources management on a watershed basis. Each agency, including the Department of Environmental Quality (DEQ), works with individual watershed councils to implement the principles and objectives of the Plan. There have been several iterations of the Oregon Plan, but fundamentally it is a series of documents of which the primary elements are: 1) state agency measures that specify activities that go above and beyond business as usual; 2) a commitment to enforcing existing environmental laws; 3) a commitment to monitor the implementation and effectiveness of all activities needed for restoration. Implementation of the Plan is viewed as a means to comply with the Clean Water Act and Endangered Species Act (ESA). For more information on the Oregon Plan, see [www.oregon-plan.org](http://www.oregon-plan.org).

The Oregon Governor's Office has taken the lead on promoting and tracking the many concurrent state efforts to address watershed management. The Office created the Governor's Watershed Enhancement Board (GWEB), which serves as a forum for the discussion of natural resource issues across jurisdictional lines. GWEB was created to facilitate discussion among agencies and as a forum to talk about issues on a watershed scale. Today OWEB has two primary functions: to 1) provide infrastructure, support, and funding for 93 watershed councils and projects that will improve watershed conditions, and 2) provide guidance through technical assistance such as watershed assessment methodology, and monitoring protocols. First and foremost, OWEB is a grant-making agency with about \$21 million in funds per year. OWEB works cooperatively to fill natural resource data gaps not covered by other agencies or efforts. Current efforts include completing stream networks at 1:24,000 statewide and identifying anadromous fish distribution data at that scale.

In Oregon, most agencies including OWEB, DEQ, and the Oregon Department of Agriculture (ODA) operate as equals with similar powers bestowed by the Oregon legislature. Thus, long standing agencies are compelled to work with OWEB to implement their programs and support the Oregon Plan. In 1997, the formal passage of the Oregon Plan not only enhanced the credibility and prominence of local watershed councils, it also increased the expectation of accountability for agencies whose programs protect and restore salmon and watersheds. Many councils now work directly with local governments on issues such as land use and park planning as well as with Oregon state agencies to implement their programs (e.g., TMDLs).

OWEB is attempting to use the Oregon Plan (and thus the CWA and ESA) as drivers to spur citizen action. OWEB has adopted a strategy of developing watershed plans from watershed assessments completed at a local level. The councils themselves do not have any regulatory or taxing authority, so their activities are based on voluntary participation of members. However, some of the participating agencies do have regulatory authority and use the council as a forum for their programs (e.g., TMDLs). For more information on OWEB see: [www.oweb.state.or.us](http://www.oweb.state.or.us)

Funding sources for statewide and local watershed efforts are widespread and include the Department of Fish and Wildlife, National Marine Fisheries Service (NMFS), Bonneville Power, Oregon Watershed Enhancement Board (OWEB), DEQ (through 319 and SRF) and the Oregon Department of Agriculture (ODA). Individual landowners and local governments play a large role in implementation with local councils (sponsored and funded through OWEB) setting the priorities and employing voluntary resources. Each individual council seeks their own funding; there is little coordination of funding allocations at the OWEB level.

Although many agencies in Oregon, including DEQ and ODA, have formally adopted “watershed approaches,” each has its own view of how to manage such approaches. For example, ODA does not use actual watershed boundaries, but they rely heavily on the themes of the “watershed approach” in working directly with landowners. Although state agencies still have different jurisdictional areas and differing mandates, the information sharing and consensus building aspects of watershed approaches are helping people to see the differences and similarities between their jurisdictions, roles and responsibilities.

In DEQ, TMDLs are driving efforts to align programs around watersheds primarily due to the authority inherent in the watershed council plans and EPA’s approach to TMDL policy and funding. DEQ’s TMDL program includes ODA’s SB 1010 program (to implement NPS control measures for agriculture) and is beginning to link to other action-oriented programs such as those within the Oregon Department of Forestry. TMDLs are serving as the means to integrate other programs in watersheds, but permits, 319 funding, monitoring, and others are not fully integrated at this time. The DEQ regions are decentralized so it has taken time to work through the “buy in” to the watershed approach among some DEQ programs (e.g., permitting).

The efforts of DEQ, ODA and other state agencies coupled together with local watershed council input are the start of a well coordinated state/local/citizen water quality program for addressing watershed protection and restoration. One source of conflict, however, has been that different agencies, NGOs, and local stakeholders work at different watershed levels. TMDLs, for example, are generally being completed at the sub-basin or 8 digit HUC level, while watershed councils typically operate on somewhat smaller scales ranging from the sub-basin level down to the 11 or 14 digit HUC scale. To further complicate matters, other efforts such as the Northwest Forest Plan and National Estuary Plans encompass multiple watershed units.

For more information about Oregon's watershed approach, contact: 503-229-5279.

## TEXAS

The watershed approach in Texas is based on set of existing structures and programs involved in water resource assessment, planning, and management. These include:

**Texas Natural Resource Conservation Commission.** The Texas Natural Resource Conservation Commission (TNRCC), a state agency directed by three governor-appointed commissioners with 3,000 employees, 16 regional offices, and a \$410.9 million annual budget (FY 2000). The TNRCC handles USEPA delegated environmental programs in the state, including all relevant Clean Water Act programs. In 1998, the state reorganized the TNRCC along functional rather than media or statutory lines. Calls from the regulated community for “one-stop shopping” regarding environmental permits were a key factor in the reorganization. The new functional management structure has resulted in some scattering of Clean Water Act programs across the organizational spectrum, but state water program staff have continued to meet regularly on an ad hoc basis to continue various watershed initiatives and water program projects (e.g., 319 projects, assessments, NPDES permit coordination, SDWA projects, TMDL development).

**River Authorities.** In 1929, the Texas legislature established 16 river basin authorities or commissions throughout the state. The river authorities own and manage water and wastewater utilities, river reservoirs, and operate a variety of watershed assessment, planning, management, and flood control projects. The functional reorganization of TNRCC has resulted in a greater focus on activities and coordination within the river authorities and their staff, resources, and stakeholders. TNRCC control over the river authorities is limited to a portion of their funding. Some river authorities have ad-hoc teams focused on specific monitoring programs, TMDLs, water quality projects, or other activities.

**The Texas Clean Rivers Program.** The Clean Rivers Program was established by the legislature in 1991 to provide an initial framework for water resource management statewide. The program supports a number of water monitoring, stakeholder involvement, and program/project coordination activities across the states, often in close partnership with TNRCC and the river authorities. The Texas Clean Rivers Act was a key milestone in the attempt to shift from a statewide approach that focused primarily on reducing point sources loadings through technology-based performance standards to a greater focus on a geographically-centered, water quality-based approach. The emphasis of the Act was on assessment and monitoring. The existing River Basin Authorities, which previously had focused on water resources development were called upon to play a key role in implementing the Act.

**Permit-By-Basin Rule.** In response to action by the state legislature, in January 1995, TNRCC issued a Permit-by-Basin Rule. This regulation called for NPDES and other water-related permit programs administered by TNRCC to be carried out on a 5 year rotating basin cycle. The rule also included a prohibition on issuance of a permit with less than a 2 year life span.

**Statewide Watershed Management Framework.** In 1996, the TNRCC's Office of Water Resource Management (OWRM) published *The Statewide Watershed Management Approach for Texas: A Guidance Manual for TNRCC's Office of Water Resources Management*. This document laid out the roles and responsibilities within TNRCC for advancing the watershed approach. The framework was built upon the structure of the 16 river basin authorities and the work they and others do under the state Clean Rivers Program, as well as TNRCC's activities associated with implementation of the CWA. The draft Framework strongly embraced the concept of the 5 year rotating basin approach that included a schedule for moving each of the major river basins in the state through 5 management steps over a 5 year period. It called for creating, over time, Watershed Action Plans for each of the state's major basins. These Plans would emerge from extensive stakeholder involvement at the grassroots level within each of the basins, with the river basin commissions playing a lead role. It also called for creation of basin coordinators positions within the OWRM/TNRCC. These persons would promote and facilitate needed coordination between OWRM programs and stakeholders at the basin level. Finally, it called for expansion of the role of the existing basin steering committees, which provide advice to the river basin commissions.

Some features of the 1996 Framework, however, have not been implemented. Basin coordinator staff positions were never created in TNRCC and instead coordination occurs on a basin-by-basin basis through the work of staff-level teams. In recent years, much of the work of the teams has been focused on development of TMDLs. Watershed Action Plans of the type envisioned in the Framework are not being developed; rather, TMDLs and the associated implementation plans serve as watershed plans. Such plans are often less comprehensive than what was originally envisioned in the Framework, though TNRCC is now trying to add other elements to the TMDLs – such as prevention strategies and non-pollutant stressors.

Despite the difficulties Texas has had with implementing the five-step watershed approach in the late 1990s and the challenges posed by agency reorganization, TNRCC is proceeding with a hybridized watershed management program that incorporates most elements of the watershed approach, partly by funneling resources and promoting program goals to the river authorities. NPDES permits, for example, (under state management since 1998) are being coordinated within river basins where possible – some river authorities operate drinking water and wastewater plants. The agency is also working very closely with the river authorities on monitoring, assessment, permit issuance, identification and targeting of problems, development of selected management practices, and enforcement. The various Clean Water Act programs (e.g., TMDLs, 319, NPDES, etc.) have continued to address their particular responsibilities while participating actively in a loose watershed management coalition driven by the river authorities, state Clean Rivers Act programs, and federally delegated water program requirements. The creation of a cross-cutting TNRCC Water Quality Coordinating Team has also helped promote integrated, geographic-based approaches to water quality problems.

For more information on Texas' watershed approach, contact: Water Quality Division; 512-239-4671

## WASHINGTON

Currently there are two primary watershed approaches in use in Washington State: (1) the Basin Management Approach managed by the Water Quality Program in the Department of Ecology and (2) the Watershed Planning Act implemented by county and local governments. These frameworks are described in detail below.

**The Basin Management Approach.** The Water Quality Program's initial statewide watershed framework was developed partly due to the recommendations of a Washington State legislature "efficiency commission" and partly as a result of a settlement to one of the state's initial TMDL lawsuits. Based on the efficiency commission findings, the Department of Ecology (Ecology) began to lay the groundwork for a basin approach to better coordinate their activities and manage their workload. The settlement agreement called for consideration of a basin approach similar to the framework developed by North Carolina. The final strategy, described in the Water Quality Program's Basin Approach framework document (1993), focused primarily on the monitoring and permitting programs and included a phased expansion to include voluntary inclusion of other parts of Ecology's water quality program.

The Basin Management Approach Framework divided the state into twenty-three Water Quality Management Areas (WQMA). The WQMAs were formed by combining sixty-two existing hydrologic units or Water Resource Inventory Areas (WRIAs). The criteria for combining the WRIAs into the smaller number of WQMAs included ecological similarity and common water quality management problems. The lower number of WQMAs allowed for fewer geographic management units, smaller staff assignments, and reduced complexity in scheduling the WQMAs for a 5 step, 5 year rotating basin management process. The process consists of sequencing sets of WQMAs through a 5-year watershed management cycle (e.g., scoping, data collection/analysis, technical report development, implementation). Under the Framework, WQMAs were assigned to Regional Offices who were to work in collaboration with Ecology headquarters staff and be responsible for attending to the milestones identified in the management cycle. The Framework allowed the Water Quality Program to assign staff people to each WQMA and to focus their resources on a geographic basis. The cycle has been modified over time, but significant elements of the Framework remain intact and have wide application in many components of Ecology's current water quality programs. For example, the NPDES program still organizes their operations (e.g., permit renewals) using the Basin Approach.

Over the past few years, the Water Quality Program has used the Basin Approach to implement their Total Maximum Daily Load (TMDL) program. Ecology works with communities to develop TMDLs through a cooperative state-local planning effort. Due to the TMDL program and settlement requirements, however, Ecology has had to abbreviate the Basin Management schedule and process as several "priority TMDLs" interfered with the basin schedule.

**The Watershed Planning Act (County and Local Governments).** Before all parts of Ecology's

programs were able to adopt the Basin Approach statewide watershed framework, the legislature passed legislation in 1998 that mandated a local voluntary approach for watershed planning. This approach, authorized under the Watershed Planning Act (RCW 90.82 / ESHB 2514), is the most widely practiced watershed planning in the state and is often called the “2514” process after its bill number (HB2514). The Act requires that county or regional governmental authorities act as leads for water resource planning and river flow management (i.e., water supply and flood management). The Act provides guidance and funding for building local capacity to establish watershed committees and develop plans primarily to address water quantity, but the planning entities may choose to include water quality and habitat issues. The local watershed planning groups may include representatives from local water interests, local governments, tribes, and, upon invitation, state agencies. The local watershed planning committees can also be used as a forum for public education and discussion on water resource and quality issues.

Ecology has assigned 15 Water Resources Program staff positions across the state to coordinate with the locally led “2514” watershed planning organizations. Although not every “2514” effort has exercised the water quality option, Ecology staff has provided technical assistance on water quality to many of the local forums. The staff provides technical assistance on monitoring and assessment, coordinates resource support, and has helped local groups develop watershed specific rules. In addition, Ecology staff provide guidance on coordination and funding for development of “2514” plans.

As of August 2000, there were planning committees established in 40 of the 62 watersheds (WRIAs) throughout the state. The planning process has several phases and none of the committees have progressed through all the phases to produce a comprehensive watershed plan. Twenty-eight of the 35 active watersheds have received funding for assessments of water quantity issues. Twenty-nine of the 35 watersheds are doing water quality planning in addition to water quantity planning. Recently there has been an increased level of discussion and interest among the local watershed planning groups regarding water quality related issues (e.g., TMDLs, stormwater).

Although the Water Quality Program continues to rely on the Basin Management Approach for certain core program areas (e.g., NPDES permitting), there have been some changes to the approach over the past few years. The Water Quality Program no longer produces Technical Reports for each WQMA as part of their Basin Approach management cycle. TMDLs are the closest approximation to Technical Reports being produced. Due to some confusion among local authorities and citizens regarding the different watershed approaches within the state, Ecology has begun to build stronger links to the local watershed planning groups established as part of the 2514 Watershed Planning Act. The state is looking for ways to integrate the Basin Management and the 2514 planning approaches and with other watershed approaches in the state (e.g., Puget Sound Water Quality Management Program). For more information on Washington’s watershed approaches, contact web address: <http://www.ecy.wa.gov/programs/wq/wqhome.html>