



# Wetland Monitoring & Assessment

**“Water has a voice. It carries a message that tells those downstream who you are and how you care for land.”**

—Bernie McGurl,  
Lackawanna River  
Association

## Wetlands Provide Beneficial Services

Wetlands are the vital link between water and land. They are among the most biologically productive ecosystems in the world. Because of their strategic position within the landscape, wetlands can provide a wide variety of ecosystem services such as:

- Improving water quality by filtering sediment, nutrients, and pollutants.
- Reducing flood damage.
- Preventing bank and shoreline erosion.
- Recharging ground and surface water supplies.
- Providing vital fish and wildlife habitat.
- Offering opportunities for recreation, education, and research.
- Producing food, forest, and fuel products.



## Why Should We Monitor Wetlands?

Assessing wetland health through monitoring is vital to their protection. Because wetland resources support healthy environments, communities, and economies, effective watershed management should include conservation and restoration of wetlands and their functions. Knowledge gained from wetland monitoring allows water resource managers to:

- More effectively protect wetland and aquatic resources.
- Select and prioritize wetlands and watersheds for restoration.
- Better manage watershed impacts.
- Determine whether proposed projects will create water quality problems.
- Evaluate the effects of the placement of fill on a watershed.
- Aid in evaluating mitigation projects.
- Help assess methods to limit pollution sources to waterways.
- Encourage wiser watershed planning.
- Better understand how wetlands contribute to the functioning of the watershed as a whole.



Wetlands are among the most biologically diverse ecosystems in the world.



Because of their strategic position in the landscape, wetlands help attenuate flooding.

Polls around the country consistently demonstrate that the American public values water quality. For example, in a 1999 survey conducted by the City of Lenexa, Kansas, 1,169 citizens and 418 businesses listed the following top three concerns for city improvements (in order): (1) protect water quality, (2) limit damage to structures, and (3) minimize street flooding.

## Can Your Program Benefit From Wetland Monitoring?

The purpose of the Clean Water Act (CWA) is to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” We are all concerned about protecting the quality and quantity of water for ourselves and future generations. Wetland monitoring, as prescribed under CWA Section 305(b), can aid us in attaining that goal.

Many water programs can benefit from wetland monitoring. States and tribes can monitor wetland health to develop ecologically based programs. This provides the programmatic foundation for refining existing wetland water quality standards (CWA Section 303), monitoring and reporting the condition of wetlands (CWA Section 305 (b)), influencing permit decisions (CWA Sections 401 and 404), identifying impaired waters (CWA Section 303(d)), obtaining additional resources for monitoring wetlands (CWA Section 106), and evaluating the performance of nonpoint control measures (CWA Section 319). Other state and federal programs, such as stormwater (CWA Section 402) and source water protection (Safe Drinking Water Act (SDWA)), may also benefit from integrating wetland monitoring.

## Examples Of How Wetland Monitoring Supports Water-related Programs

### Water Quality Standards: CWA Section 303

Few states or tribes have specifically incorporated wetlands into their water quality standards.

Wetlands are often assigned the designated uses and criteria of adjacent rivers or lakes, which may be ecologically inappropriate for wetlands. Water quality standards include basic components of designated uses, narrative and numeric criteria, and an antidegradation policy. When specifically tailored to wetlands, they provide a consistent basis for the development of policies and technical procedures for managing activities that impact wetlands. Wetland-specific designated uses and criteria provide greater protection for a state’s or tribe’s wetlands by specifying the condition of the resource being protected. Bioassessments provide data on the aquatic life support uses of a particular wetland or wetland type and will provide data upon which to

derive biological criteria. A state or tribe can protect wetlands from activities that fall outside the jurisdiction of the federal 404 permit program by specifically identifying the impacting activity in its antidegradation policy.

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### Tracking and reporting conditions: CWA Section 305(b)

Under CWA Section 305(b), states and tribes are required to report on the quality of their waters, including wetlands. Through ambient water quality monitoring, states determine if a waterbody satisfies the criteria associated with each of its designated uses. Waterbodies that satisfy the criteria are deemed to attain water quality standards, while those that do not satisfy the criteria are deemed impaired. The reporting requirement, a legal mandate, also has the practical aspect of offering individuals and public officials an opportunity to better understand the implications of their activities on the condition of their resources.

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### Funding for wetland monitoring: CWA Section 106 and Section 104(b)3

CWA Section 106 provides funds to states and tribes to monitor waters, including wetlands. Monitoring wetlands using bioassessments is critical to adequately protecting these resources and, through the identification of impaired wetlands, can also increase the amount of funds available for monitoring state waters.

The Wetland Program Development Grants described in Section 104(b)3 provides states, tribes, and local governments (S/T/LGs) an opportunity to develop projects which build and refine comprehensive wetland programs. Since 1995 Congress has appropriated \$15 million annually to support the grant program. EPA encourages S/T/LGs to build effective comprehensive wetland programs in six areas, which includes monitoring and assessment (*Core Elements of a Comprehensive Wetland Program* available on the web at [www.epa.gov/owow/wetlands/initiative/fy02elements.html](http://www.epa.gov/owow/wetlands/initiative/fy02elements.html)).

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### Identifying impaired waters and TMDL implementation plans: CWA Section 303(d)

CWA Section 303(d) requires states and tribes to identify impaired waters and develop total maximum daily loads (TMDLs) for those waters. Wetland monitoring can provide information on whether wetlands need to be added to or removed from the list of impaired waters. In addition, wetland monitoring can support the development of TMDL implementation plans, which should always include



Monitoring wetlands helps to ensure quality habitat for wildlife like this little blue heron that depend on wetlands to survive.



hydrologically connected wetlands. Restoring and maintaining the health of wetlands can improve the recovery of impaired waters.

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**Influencing federal permits and licenses: CWA Section 401**

CWA Section 401 water quality certification gives states and tribes broad authority to certify, condition, or deny any federal permit or license that would violate their water quality standards. Affected permits and licenses include: dam relicensing, CWA Section 404 dredge and fill permits, and CWA Section 402 point source discharge permits in non-delegated states. A state's water quality certification program, however, is only as strong as the water quality standards upon which they are based.

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**Evaluating effectiveness of nonpoint source controls, restoration, and BMPs: CWA Section 319**

Many federal, state, and local programs attempt to restore wetlands and use BMPs to reduce the amount and impact of nonpoint source pollution. However, few programs evaluate how well the activities actually improve the overall ecological condition of wetlands. Monitoring can benefit wetland programs by evaluating the effectiveness of restoration and best management practices, such as buffer strips, designed to improve the condition of wetlands. In addition, [CWA Section 319](#) requires states to monitor the effectiveness of these methods used to reduce the amount and impact of nonpoint source pollution. Wetland monitoring can improve the investment of limited conservation resources.

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**Identifying priority watersheds and demonstrating recovery of watersheds**

At a watershed scale, monitoring can be used to demonstrate the value of wetlands at protecting or improving the condition of other waterbodies in a landscape and document the effectiveness of watershed recovery plans (e.g., TMDL implementation plans, Watershed Restoration Action Strategies, Comprehensive Conservation and Management Plans). Many surface streams and lakes are listed as impaired due to nutrient loading, sedimentation, and hydrologic modification. Scientific literature demonstrates wetlands' ability to decrease nutrient loading and sedimentation. An assessment of the condition of naturally occurring and restored wetlands is integral to deciding whether in-stream and lake resources are on a path toward recovery.

## Wetland Tidbits

- Recent research suggests that by restoring wetlands to 1 percent of the watershed, nitrate and herbicide runoff can be reduced by up to 50 percent (Robinson, 1995).
- “Apart from a wetland's own quality, because wetlands are good at filtering nonpoint source pollution, further loss of wetlands in impaired watersheds could increase total daily maximum loads (TMDLs) over time. Similarly, ongoing wetland destruction could push unimpaired watersheds over the line into TMDL territory” (McCallie, 2000).
- According to the U.S. Fish and Wildlife Service and other researchers, a single acre of wetland can store 1–1.5 million gallons of floodwater. The capacity for floodwater retention varies among wetland types, but prairie pothole wetlands have been shown to store the most. Regardless of wetland type, a network of small wetlands can store an enormous amount of water.

### References

- McCallie, Grady. 2000. Wetland Water Quality Standards—An Unfinished Foundation for TMDLs. *National Wetlands Newsletter*. [Environmental Law Institute](#). Vol. 22. No. 3. Page 9.
- Robinson, Ann. 1995. Small and seasonal does not mean insignificant: Why it's worth standing up for tiny and temporary wetlands. *Journal of Soil and Water Conservation*. November-December 1995, Pages 586-590.



Assessing the health of wetlands can help determine if they should be removed from a state's 303(d) list.



Dave Davis

Wetlands are often assigned the water quality criteria of nearby lakes or rivers, which are ecologically inappropriate for wetlands.

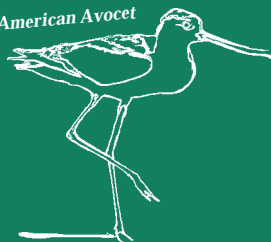
Great blue heron



***When we destroy wetlands,  
there can be enormous impacts.  
If we preserve the health of  
wetlands and restore wetland  
ecosystems, it simply follows  
that we generate associated  
environmental, social,  
and economic benefits.***

### *The Wetland Fact Sheet Series*

American Avocet



[Wetlands Overview](#)

[Types of Wetlands](#)

[Functions & Values of Wetlands](#)

[Threats to Wetlands](#)

[Wetland Restoration](#)

[Funding Wetland Projects](#)

[Wetland Monitoring & Assessment](#)

[Sustainable Communities](#)

[Volunteering for Wetlands](#)

[Teaching about Wetlands](#)

For more information, visit [www.epa.gov/owow/wetlands](http://www.epa.gov/owow/wetlands).

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### ***Related Fact Sheets***

[Wetland Monitoring and Assessment: A Technical Framework Fact Sheet](#), EPA 843-F-01-002h

[Funding Wetland Projects: Wetland Program Development Grants Fact Sheet](#), EPA 843-F-01-002i