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HOW WETLANDS DIFFER FROM TRADITIONAL WATERS; WHAT THIS MEANS TO WETLAND WATER QUALITY STANDARDS

By
Jon Kusler, Esq.
Association of State Wetland Managers

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HOW WETLANDS DIFFER FROM TRADITIONAL WATERS; WHAT THIS MEANS TO WETLAND WATER QUALITY STANDARDS[1]

By Jon Kusler, Esq.[2]

This paper has been prepared to stimulate discussion. It is one of several papers on the subject of wetlands and water quality standards prepared by the author for the Maryland Department of the Environment.[3] This paper has been updated. Recommendations are based, primarily, upon lessons learned from the fourteen states which have adopted explicit water quality standards for wetlands. More detailed recommendations concerning content of wetlands and water quality standards based upon the experience of other states are contained in a companion paper: Jon Kusler, Water Quality Standards for Wetlands.

This paper addresses three questions: How are wetlands similar to other waters? How are wetlands different from other "traditional" waters? What do these differences mean in terms of establishing water quality standards for wetlands?

Clean Water Act Requirements

The Clean Water Act establishes a federal/state/tribal partnership to restore and protect the chemical, physical, and biological integrity of the Nation's waters (See Section 101 of the Act). Section 303(C)(2)(A) requires states to adopt water quality standards for waters. Section 305(b) and 303(d) of Clean Water Act and regulations adopted by the U.S. Environmental Protection Agency (EPA) pursuant to these sections require states to list "impaired" waters. See Jon Kusler, Water Quality Standards for Wetlands. No distinctions are made in the Act between wetlands and other waters.

A water quality standard consists of four basic elements:[4]

1. designated uses of the waterbody (e.g., recreation, water supply, aquatic life, agriculture),
2. water quality criteria to protect designated uses (e.g., numeric pollutant concentrations and narrative requirements,
3. an antidegradation policy to maintain and protect existing uses and high quality waters, and
4. general policies addressing implementation issues (e.g. low flows, variances, mixing zones).

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[1]This discussion paper has been prepared with support from the Maryland Department of the Environment and the U.S. Environmental Protection Agency. Some of the material included in the paper has been extracted from EPA web sites.

[2]Association of State Wetland Managers. The ideas expressed in this paper are those of the author and not necessarily those of the Association or the State of Maryland.

[3]See Jon Kusler, Water Quality Standards for Wetlands; Jon Kusler, TMDLs and Wetlands. Jon Kusler, Implications And Management Options For Wetlands That Fail To Meet "Designated Use"

[4]See http://www.epa.gov/waterscience/standards/about/.

EPA in 1990 developed overall guidance for the states in developing water quality standards for wetlands. EPA guidance suggests that states in adopting water quality standards for wetlands:[5]

- "Include wetlands in the definition of "state waters."
- Designate uses for all wetlands.
- Adopt aesthetic narrative criteria (the free froms) and appropriate number criteria for wetlands.
- Adopt narrative biological criteria for wetlands.
- Apply the State's antidegradation policy and implementation methods to wetlands."

However, EPA guidelines are flexible and leave considerable discretion to the states.

Fourteen states have adopted water quality standards for wetlands including Wisconsin, Minnesota, Colorado, California, Nebraska, North Carolina, Ohio, Hawaii, Iowa, Florida, Wyoming, Maine, Massachusetts and Washington State. See more detailed discussion of these programs in the companion paper: Jon Kusler, State Water Quality Standards for Wetlands.

Efforts by states to develop and implement water quality standards for wetlands have proven difficult for a number of reasons discussed below although wetlands and more traditional waters also share important characteristics. How are wetlands similar to other waters?

Shared Characteristics Between Wetlands and Traditional Waters

Wetlands share many features with traditional waters (lakes, ponds, rivers, streams, estuarine and coastal waters). Both wetlands and other waters:

- Are saturated from precipitation, high ground water, or tides much of the time,
- Support a range of flora and fauna adapted to inundated or saturated conditions,
- Are characterized, in part, by saturated soils,
- Provide a broad range of services to society including but not limited to fisheries, habitat for rare and endangered species, water supply, recreation, aesthetics, etc.
- Are subject to a broad range of chemical, physical, and biological pollutants which threaten the flora and fauna and many of the services to society,
- Are, in most instances, considered "waters of the U.S." by the federal government and most states,
- Are subject to public trust and navigable servitude doctrines (in some instances), and
- Affect, through runoff and ground water flow, the quality and quantity of other waters.

[5] http://www.epa.gov/owow/wetlands/regs/quality.html

However, there are also important differences:

Differences Between Wetlands and More Traditional Waters

A. Wetlands Share Many Characteristics with "Lands" as Well as "Waters." Many wetlands (e.g., forested wetlands, wet meadows) are dry a portion of each year and may be dry for years at a time. Some wetlands have saturated soils but no or little standing water. When dry, they may be characterized by upland plant species and, in some instances, are not easily recognized as wetlands. During dry periods, wetlands may be farmed, used to grow trees, or used for other upland purposes. Unlike navigable lakes, streams, and the oceans, the beds of wetlands are often privately owned. Unlike lakes, streams, and the oceans, wetlands are typically subject to not only "water" policies and management programs but land use goals and doctrines and management techniques such as local land use planning, subdivision regulations, zoning, and building codes.

B. Wetlands Have a Unique Relationship to Other Waters. Wetlands not only have some "land" characteristics but also have a unique relationship to other waters. Wetlands, in some instances, intercept pollutants and act as buffers for other waters. They help reduce the sediment loadings and pollution from natural sources and the activities of man such agriculture, forestry, road building, and commercial, residential and industrial development. Increasingly, wetlands are constructed to provide "tertiary" treatment of liquid wastes by removing nitrogen and phosphorous. Wetlands are often restored or created to temporarily store and purify storm waters.

The dual role of wetlands as waters needing protection and waters which protect other waters creates a challenge for establishment of water quality and other regulatory standards including the application of an antidegradation policy. Are they, in a given instance, to be considered "lands" and used for protection of other waters from pollution, sediment, and other impacts? Or, are they to be considered "waters" and given a high degree of protection like other waters.

C. Differences in Functions/ Values/ Services. The functions/values of wetlands are similar in some respects and different in others to the functions/values of more traditional waters. For example, they are both habitat for many waterfowl and other birds, fish, reptiles, and amphibians. They are both important for water supply for agriculture, residential, commercial and industrial uses and for recreation. These are common "designated uses" for lake, stream, and estuary water quality standards.

However, most wetlands are not prime swimming areas. Many are not prime canoeing or boating waters. Many of the smaller and drier wetlands (e.g., vernal pools) are not fishing areas although they may provide food chain support for fisheries. But, wetlands also provide a broad range of other services which are not dependent upon water quality but depend more on water quantity, depth, and velocity. Examples include:

- Flood storage.
- Flood conveyance.
- Pollution control.

- Wave attenuation.
- Erosion control.
- Ground water recharge.

D. Differences in Sensitivity to Small Changes in Precipitation. Traditional waters (lakes, streams, coastal waters) typically continue to be recognizable as waters even when seasonal or longer term variations in precipitation and runoff occur. In contrast, a seasonal or long term change in hydrology of even one foot will often temporarily render a wetland dry. Such a change may also destroy a wetland if the change is permanent (e.g., drainage). Seasonal and year to year variability complicate establishment of water quality criteria for wetlands.

E. Differences in Threats. Both wetlands and traditional waters are threatened by pollutants (point and nonpoint source) such as toxic chemicals, bacteria, nutrients, and sediment. But, wetlands are also threatened by a broad range of additional activities which affect their ability to provide goods and services. These threats include filling and drainage for agriculture, forestry, subdivision, commercial development, flooding, vegetation removal, and road building. Sediment is also a problem, particularly for smaller isolated wetlands which act as sediment sinks. Water quality standards to "maintain and restore" wetlands must address these additional threats if they are to protect wetlands and the goods and services they provide.

F. Differences in Numbers of Water Bodies. Traditional water bodies such as lakes, streams, and coastal waters may number in thousands or even tens of thousands in a state. In contrast, wetlands may number in the millions. This greatly complicates and makes more expensive the development of wetland-specific water quality standards and TMDLs including the mapping, assessment, standard-setting, monitoring and other measures needed for individual bodies of water.

G. Differences in the Ability of Landowners and Others to Identify Wetlands. Traditional waters in lakes, ponds, rivers, streams and the ocean are often regulated without mapping because they can be described with relative certainty in regulations and their boundaries can be quite readily identified in the field by landowners and regulatory agencies through a combination of air photos, remote sensing, and field observations of water all or most of the year and (note, this is not true for ephemeral streams). Wetlands are more difficult to identify and delineate their boundaries, particularly isolated wetlands and other wetlands which are dry a portion of the year.

H. Differences in Reversibility of Impacts, Restoration Techniques, Cost of Restoration. Many impacts to traditional waters such as toxic pollution and nutrients may be, over time, partially or totally reversed when pollution is stopped. In contrast, the impacts of drainage or fills on wetlands are not ordinarily reversed when drainage or fill activities are stopped. Active restoration is needed. For drained wetlands, hydrology must be restored. For filled wetlands, fills need to be removed. Both may be expensive and time-consuming. This makes wetland water quality regulators reluctant to assign an "impaired" status to filled or drained wetlands if restoration is thereby required. In

addition, traditional impairments may reflect that a wetland is providing a service to other waters.

I. Differences in the Establishment of Indices of Biological Integrity. Due to fluctuating water levels, wetland plant and animal life are often quite variable from season to season and year to year. In addition there is often a broad range of plant and animal species within an individual wetland depending upon water depth, nutrients, and other factors at specific sites. This makes it difficult to establish and apply wetland water quality biocriteria. It is also difficult to characterize and document the animal or plant life of a wetland with only a single visit or small number of visits. This is particularly true for vernal pools, playas, forested wetlands and wet meadows which are dry a portion of the year. It is also difficult to establish "normal" levels for nutrients and dissolved oxygen.

J. Differences in Water and Land Use Law, the Taking Issue. Traditional waters (lakes, rivers, streams, the ocean) are often subject to state "public trust" and federal "navigable servitude" doctrines. This means that public access and access by regulatory staff is possible. This also reduces the likihood of successful "takings" challenges if permits are denied. Isolated and headwater wetlands are not, to the same extent, protected by public trust and navigable servitude doctrines. Access may be denied to private wetlands. The "taking" issue is, therefore, more of a potential problem although courts have given water quality protection strong support.

Recommendations for Establishing Wetland Water Quality Standards

What do these similarities and differences between wetlands and traditional waters mean to the establishment of wetland water quality standards? Some suggestions include:

- **If a state wishes to protect wetlands, it must regulate the full range of threats to wetlands such as drainage and not simply pollutants.** Differences in threats to wetlands and other waters need to be taken into account in establishing water quality standards for wetlands and in the processing of individual regulatory permits. For examples of water quality regulations which regulate not only pollutants but other threats to wetlands see Wisconsin, Minnesota, Ohio, and North Carolina regulations in Appendices A and B, Jon Kusler, Water Quality Standards for Wetlands.

- **Although water quality standards are not enough in themselves to protect wetlands, they can play an important role in wetland protection particularly if water quality problems related to water quantity is taken into account.** To comply with EPA requirements and better protect wetland systems, states should adopt wetland-specific water quality standards as well as enforce more general water quality standards as they may apply to wetlands. EPA regulations and

guidelines require states to adopt water quality standards for wetlands.[6] States should do so not only because it is required to do so but because such regulations could help protect and restore the unique features of wetlands, provide more specific guidance for landowners in 401 water quality certification, and help coordinate wetland-related permitting activities in the state. Most states could apparently adopt wetland-specific water quality regulations pursuant to existing pollution control statutes as has been done in Wisconsin, Minnesota, North Carolina and other states.

- **Water quality standards for wetlands need to reflect both the "land" as well as the "water" characteristics of wetlands.** Water quality standards need to reflect the dual roles of wetlands as waters in their own right as well as roles in protecting other waters from pollution. Watershed approaches to wetland protection and management are therefore desirable including integrated assessments, integrated goal setting, integrated regulations (wetland protection, flood loss reduction, stormwater management) and integrated mitigation requirements for impacts to wetlands. Designated uses and criteria for such uses need to reflect the dual roles for wetlands including the protection of other waters. However, dual roles also need to be approached with care because pollution and sediment control functions of wetlands to protect other waters may also result in destruction or impairment of wetlands.

- **Water quality designated uses and standards for wetlands need to reflect the full range of unique services and functions provided by wetlands.** For example, designated uses and regulatory standards need to protect not only pollution control, swimming and fishing but flood storage, flood conveyance, wave attenuation, erosion control and ground water recharge.[7] See, for example, the wetland and water quality standards of North Carolina, Wisconsin, Minnesota, and Ohio which list such broader services and functions as "designated uses" and establish protection standards for them.

- **Designated uses and standards for uses need to reflect the large number of individual wetlands often encountered in a state.** This favors adoption of narrative water quality criteria and procedures for wetlands as a whole or classes of wetlands rather than water quality standards for individual wetlands although there should be flexibility in procedures so that state water pollution control agencies can adopt wetland-specific water quality standards for particular wetlands when important wetland resources are threatened. Adoption of TMDLs may also be

[6] http://www.epa.gov/owow/wetlands/regs/quality.html. EPA provides in its National Guidelines: Water Quality Standards for Wetlands that "Water quality standards for wetlands are necessary to ensure that the provisions of the Clean Water Act (CWA) applied to other surface waters are also applied to wetlands."
[7] See EPA Wetlands and 401 Certification: Opportunities and Guidelines for States and Eligible Indian Tribes (1989) which provides, in part that "Clearly, the integrity of waters of the U.S. cannot be protected by an exclusive focus on wastewater effluents in open waters…A State's authority under Section 401 includes consideration of a broad range of chemical, physical, and biological impacts. The State's responsibility includes acting upon the recognition that wetlands are critical components of health, functioning aquatic systems."

appropriate in some cases for individual wetlands threatened by pollution or other activities. See discussion in the appendices of a companion paper: Jon Kusler, TMDLs and Wetlands.

- **A general wetland antidegradation policy is needed with careful review procedures for exceptions to the antidegradation standard.** A general antidegradation policy with implementing procedures makes sense for both traditional waters and wetlands to achieve the Clean Water Act goal to "restore and maintain." All of the states with wetland water quality standards have adopted antidegradation policies although the specifics differ. Limited and carefully proscribed exceptions in the application of this policy are also needed, particularly for activities involving some measure of pollution or impairment of wetlands (e.g., agriculture). This may degrade wetlands though the wetlands subject to such a designated use may serve to improve waters as a whole. At a minimum, destruction or serious impairment of a natural wetland should not be allowed.[8] States should require compensatory mitigation where some measure of degradation is allowed. See, for example, the wetland and water quality standards of Minnesota, Wisconsin, Ohio and North Carolina and the general wetland water quality guidance of Washington State. See Appendices A and B, Jon Kusler, Water Quality Standards for Wetlands.

- **Water quality designated uses and standards for wetlands need to reflect the sensitivity of wetlands to small changes in hydrology and the cumulative impact of land and water use activities upon wetlands.** This favors protection and management of wetlands within watershed planning and management contexts. Cumulative impacts should be explicitly addressed. See appendices of Jon Kusler, Wetlands and TMDL's.

- **The "outstanding resource waters" designation can be used as part of an antidegradation policy to protect rare wetland types or wetlands with special functions and values.** Such wetlands have to some extent already been identified in in state "Heritage" programs. For examples from states see Maryland, Wisconsin and Minnesota in Appendix B of Jon Kusler, State Wetland Water Quality Standards.

- **Water quality standards for wetlands need to reflect the relative biological condition of wetlands.** Measurement of wetland biological condition relative to undisturbed wetlands can help states develop and apply water quality standards to individual wetlands or classes of wetlands. Nevertheless, biological condition often only partially reflects wetland goods and services and broader factors need to be considered in determining beneficial uses and criteria for protecting beneficial uses. For example, the value of urban wetlands for pollution control, flood storage, flood conveyance, wave retardation and other goods and serves and not simply relative biological condition needs to be considered. See the regulations of Wisconsin,

[8]See 40 CFR 131.10 which provides, in part: "In no case shall a State adopt waste transport or waste assimilation as a designated use for any waters of the United States."

Minnesota, North Carolina, and Ohio which address a range of goods and services including "values."

- **A state may best combine adoption of wetland-specific water quality standards with improved inventories of wetland and related resources including updated wetland maps and (possibly) the preparation of more specific wetland maps indicating wetland areas with specific functions and values such as flood storage and conveyance, erosion control and pollution control.** These efforts would build upon existing efforts to map wetlands, to identify potential wetland restoration sites, to identify wetlands as waters of special importance, and to provide a general characterization of wetland functions of the sort undertaken by the U.S. Fish and Wildlife Service for the Nanticoke in Maryland.

- **States should develop cooperative wetland monitoring programs with the help of other state agencies, federal agencies, local governments and private organizations (e.g. the Nature Conservancy).** Such monitoring could help the state develop more specific water quality standards for wetlands, track regulatory permits, determine the effectives of mitigation, and help determine net losses and gains of wetland and related resources. Establishment of a system of state wetland reference sites like that developed in Pennsylvania should (desirably) be part of such a monitoring program. See Minnesota for an example of a state-wide monitoring program with many elements. See Appendices A and B, Jon Kusler, Water Quality Standards for Wetlands.

Selected Suggested Readings and Websites (See generally the following):

EPA, Environmental Indicators of Water Quality in the United States (1996)

W. Mitch and J. Gosslink, Wetlands (2d ed.) (1993)

R. Tiner, Wetland Indicators, A Guide to Wetland Identification, Delineation, Classification, and Mapping (1999).

J. Cronk & M. Fennessy, Wetland Plants, Biology and Ecology (2001)

EPA, Wetlands and 401 Certification: Opportunities and Guidelines for States and Eligible Indian Tribes (1989)
http://yosemite.epa.gov/water/owrcCatalog.nsf/065ca07e299b464685256ce50075c11a/cd15cd29df94e01d85256d83004fd959!OpenDocument

EPA, National Guidance Water Quality Standards for Wetlands (1990)
http://www.epa.gov/wetlands/regs/quality.html

ELI Study of State Wetland Programs, State Profiles
http://www.eli.org/Program_Areas/state_wetlands.cfm

ELI publication: State Wetland Protection, Status, Trends, Model Approaches
http://www.elistore.org/reports_detail.asp?ID=11279&topic=Wetlands

Association of State Wetland Manager Summary of State Wetland Programs
http://www.aswm.org/state-summaries