INTRODUCTION TO WATER QUALITY STANDARDS (WQS)

Office of Science and Technology
Office of Water
U.S. EPA

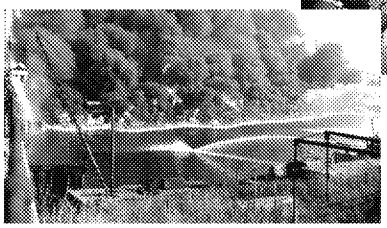
OVERVIEW

- History of the Clean Water Act
- Laws, Regulations and Guidance Related to Water Quality Standards (WQS)
- Water Quality Standards
  - Core components of WQS:
    - Designated Uses
    - Water Quality Criteria
    - Antidegradation
  - Additional Components of WQS
- Roles of States, Territories, Authorized Tribes, the Public and the EPA
- Implementing WQS

HISTORY OF THE CLEAN WATER ACT

HISTORY OF CWA AMENDMENTS

Cleveland Mayor Carl Stokes on the banks of the Cuyahoga, 1969



Cleveland's Cuyahoga river on fire

- 1948: Federal Water Pollution Control Act (FWPCA).
- **1972: Major set of amendments, as amended to "Clean Water Act" (CWA).**
- 1981: Streamlined construction grants.
- 1987: Phased out construction grants, replaced with Clean Water State Revolving Fund.
- 2000: The "BEACH Act" amendments established a grant program to support monitoring and advisory programs at coastal marine and Great Lakes beaches. Also required research and development of recreational criteria by EPA.
- Today: The "Modern" Clean Water Act.

Congressional statutes have mentioned water back as early as the 1800s. For example, the Rivers and Harbors Act, which focused on protecting navigation routes.

The Federal Water Pollution Control Act, which was enacted in 1948, is the root of the modern Clean Water Act, because it focused on protection for water quality, not only for navigation. In 1972, that Act was amended to add many of the key programs we are familiar with today, and we call the 1972 and subsequent versions of the statute the "Clean Water Act" or CWA for short.

The modern Clean Water Act includes some changes along the way. For example, the construction grants added in 1972 were replaced in 1987 by the Clean Water State Revolving Fund.

THE 1972 AMENDMENTS TO FWPCA: "CLEAN WATER ACT (CWA)"

- Established the basic structure for regulating pollutants discharged into the "waters of the US."
- Made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions.
- Funded the construction of sewage treatment plants under the construction grants program.
- Required each state and territory to adopt water quality standards for all intrastate waters and provided for EPA review and approval or disapproval.
- Provided opportunities for meaningful public engagement.

INTRODUCTION TO WQS 101

The 1972 amendments were critical to establishing the modern Clean Water Act because they provided a robust structure and some major requirements that enhanced the legal mechanisms for protecting clean water.

At a "50,000 foot level," some of the most major additions were that it:

-Established the basic structure for regulating pollutants discharged into the "waters of the US."
-Made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions.
-Funded the construction of sewage treatment plants under the construction grants program. (This has subsequently been replaced for states by the clean water state revolving fund – tribes and territories can still get grants)
-Required each state to adopt water quality standards for all intrastate waters and provided for EPA review and approval or disapproval. THIS IS THE ASPECT WE WILL BE TALKING MOST ABOUT TODAY.
and
- Provided opportunities for meaningful public engagement.

Overview

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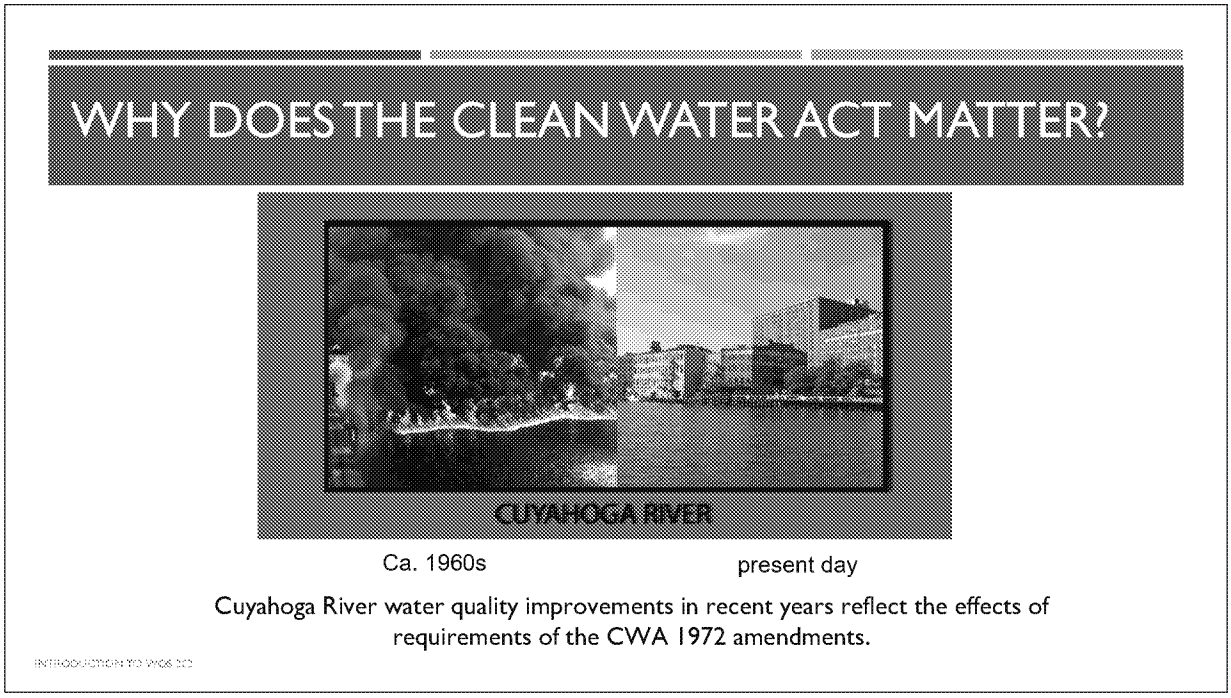

In less than 50 years, the CWA has had a big impact on improving and protecting our nation's water quality, but people may not be aware of how big its impact has been.

You may be familiar with the Cuyahoga River, "the river that caught fire", located in Northeast Ohio. At one time, the Cuyahoga River was one of the most polluted rivers in the United States, and the reach from Akron to Cleveland was completely devoid of fish.

At least 13 fires were reported on the Cuyahoga River, the first occurring in 1868, and the largest in 1952, which burned for three days and was reported to cause over 1.5 million dollars in damage. Then, in 1969, a river fire captured the attention of Time Magazine, which described the Cuyahoga as the river that "oozes rather than flows". The impairment of this river helped to spur the environmental movement in the late 1960s, and is one of the reasons why we have the CWA, which is intended to help prevent the impairment of our waters.

The picture on the right shows the Cuyahoga today. What happened between the days when the river was burning and oozing and now? Well, several things - the CWA and EPA regulations implementing the Act were put into place, the federal EPA and the Ohio EPA were created. All of these, along with public involvement, brought a lot more attention to the sources of pollution to the river, and work began to remedy the problems.

The river today still faces environmental challenges, but it has been restored in many respects, it flows again, doesn't catch fire, contains fish and other aquatic life, and attracts kayakers.

While this is an extreme case showing the benefits of the Clean Water Act, the Act and its implementing regulations can still have an effect in today's waters. For example, having state or tribal water quality standards as part of state or tribal laws gives greater control in determining how waters are protected and in defining the goals for restoration of degraded waters. Water quality standards also are important in overall efforts to prevent or minimize communities' exposure to pollutants and harmful substances. Because water quality standards set the foundation for what level of water quality must be met by other CWA programs, they provide particular opportunities for ensuring water quality protection in areas used by sensitive and environmentally overburdened populations.

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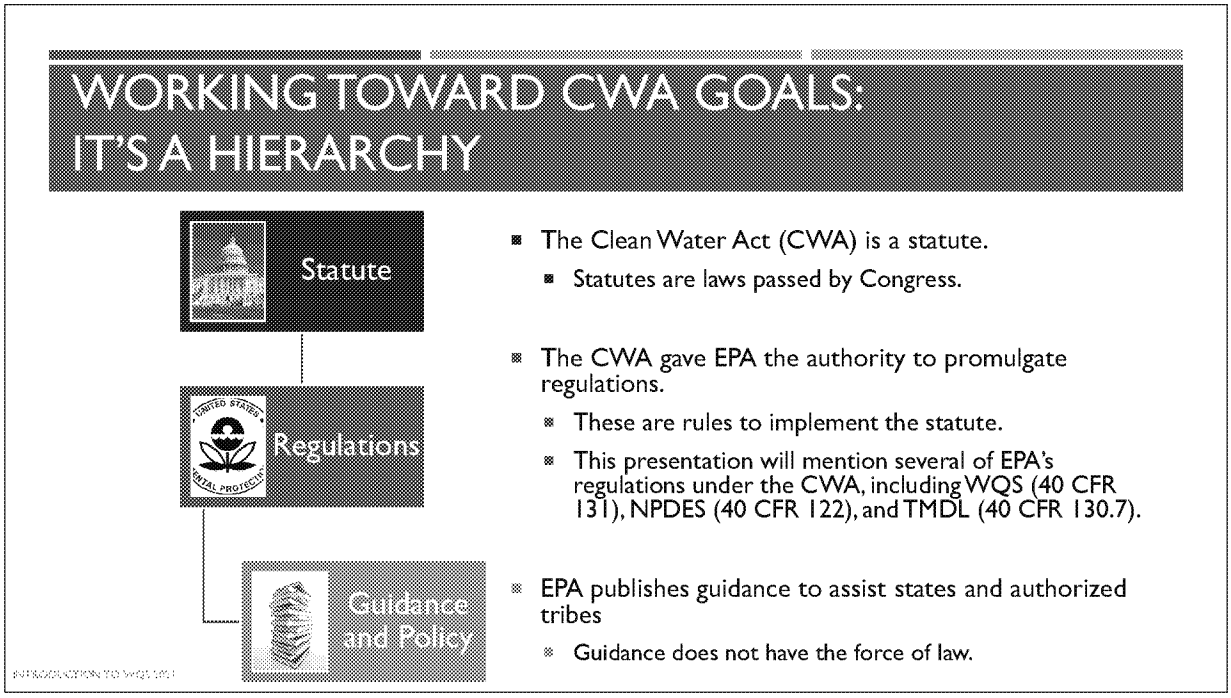
Overview

LAWS, REGULATIONS AND GUIDANCE RELATED TO WATER QUALITY STANDARDS



The Clean Water Act is a law, or a statute, passed by Congress, that imposes requirements. It is the umbrella – everything that EPA requires in its regulations under the Clean Water Act must derive from the Law.

A statute or Law is made by Congress (the legislative branch). Statutes are typically signed by the President, but in some cases (such as the Clean Water Act amendments of 1972), if the President vetoes a statute, Congress can get enough votes to override the veto for it to become a law.

Regulations under the Clean Water Act are made by EPA (an executive branch agency). Regulations implement the law. This presentation will go over many different regulations written and administered by EPA that are designed to implement the Clean Water Act. We will start by talking about Water Quality Standards (or WQS) and will also talk about National Pollutant Discharge Elimination System (or NPDES) permits and total maximum daily loads (TMDL) as well as other implementation programs.

Regulations provide detail on the Clean Water Act requirements, but often EPA also publishes guidance and policy documents that provide more detail that is meant to assist states and authorized tribes in implementation. Guidance and policy are EPA's recommendations on how to implement regulations. They do not, and should not, create a "binding norm," and cannot limit the Agency's action in a particular instance. Guidance and policy are not basis for disapproval of water quality standards. EPA can't use guidance as "proxy rulemaking." Examples of guidance and policy in water quality standards are in the Water Quality Standards Handbook.

Let's look more closely at each of these elements in the hierarchy, starting with the basics of the Clean Water Act.

LAW: CLEAN WATER ACT

- Objective: "restore and maintain the chemical, physical and biological integrity of the Nation's waters." (CWA 101(a))
- Interim goal: "wherever attainable…water quality which provides for the protection and propagation of fish, shellfish and wildlife and provides for recreation in and on the water." (CWA 101(a)(2))

In the Clean Water Act (CWA), Congress tells us that the objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. That's a great objective, and ultimately what water quality standards are all about, but it's a little hard to wrap a water quality management program around that broad-brush objective.

Fortunately, the CWA Section 101 (a) (2) provided some more nuance to that, and established that "it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983."

You will hear these phrases and these section numbers many times in your work in the WQS program, so if you haven't memorized them already, I promise you will eventually!

EPA's regulation on Water quality standards (WQS) provides further expansion on what the Clean Water Act interim goal means, and how states' and authorized tribes' WQS programs aim for the interim goal and ultimately to the main objective of restoration and maintenance of the integrity of the nation's waters.

We will get more into EPA's Water Quality Standards regulation shortly, as it is at the core of the implementing regulations for the Act.

Overview

WATERS UNDER CWA JURISDICTION

The EPA and Army are currently implementing their programs consistent with the pre-2015 regulatory regime defining "waters of the United States" (WOTUS), which includes:

- Traditional navigable waters
- Interstate waters
- All other waters…used in interstate commerce
- Impoundments of jurisdictional waters
- Tributaries of the above waters
- Territorial seas
- Adjacent wetlands

Under this regime, "waters of the United States" do not include prior converted cropland or waste treatment systems.

Note: Though litigation now prevents the agencies from implementing the 2020 definition (not shown), that definition remains "on the books" (*i.e.*, in the Code of Federal Regulations). The EPA and the U.S. Army Corps of Engineers are currently working on a proposed rule to revise the regulations defining "waters of the United States."

Before we get more into how the CWA and its implementation programs protect water quality, we need to know, what waters are we talking about when we talk about waters protected under the Clean Water Act? And beyond that what impacts on waters are we talking about?

The Clean Water Act applies to "navigable waters," which the Act further defines as "waters of the United States." This term has been defined in regulations since the early 1970s. A broad range of waters may meet the terms of the regulatory definition, including certain rivers, streams, lakes, natural ponds, wetlands, and marine waters. Marine waters include estuaries (such as bays), salt marshes, and lagoons and near-shore coastal waters.

Most recently, the EPA and the Army defined "waters of the United States" with the Clean Water Rule in 2015, a repeal rule in 2019 and the Navigable Waters Protection Rule in 2020.

Questions about what is included in the definition of WOTUS have been litigated numerous times, up to the Supreme Court.

The impact of the courts on the definition of WOTUS was illustrated in August and September of this year, when two U.S. District Courts issued orders vacating and remanding the Navigable Waters Protection Rule.

In light of this order, EPA and Army have halted implementation of the Navigable Waters Protection Rule and are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice. That pre-2015 definition is what is shown on this slide.

The agencies are continuing to develop the rulemakings announced in June—a first rule to solidify the foundational regulations that were in place until 2015, updated to be consistent with relevant Supreme Court decisions and a second rule to build upon that foundation. [note: the first rule is likely to be proposed in late November – so could add "The first rule was recently proposed for public comment."]

The definition of "waters of the United States" does not include ground water (and never has). Some states/tribes may have water quality standards for ground water, but such standards do not fall within the scope of the federally mandated water quality standards program. Therefore, if a state/tribe were to submit such standards, it is important to know that EPA does not have the CWA authority to approve or disapprove WQS for groundwater. The Safe Drinking Water Act provides protections for underground sources of drinking water.

Overview

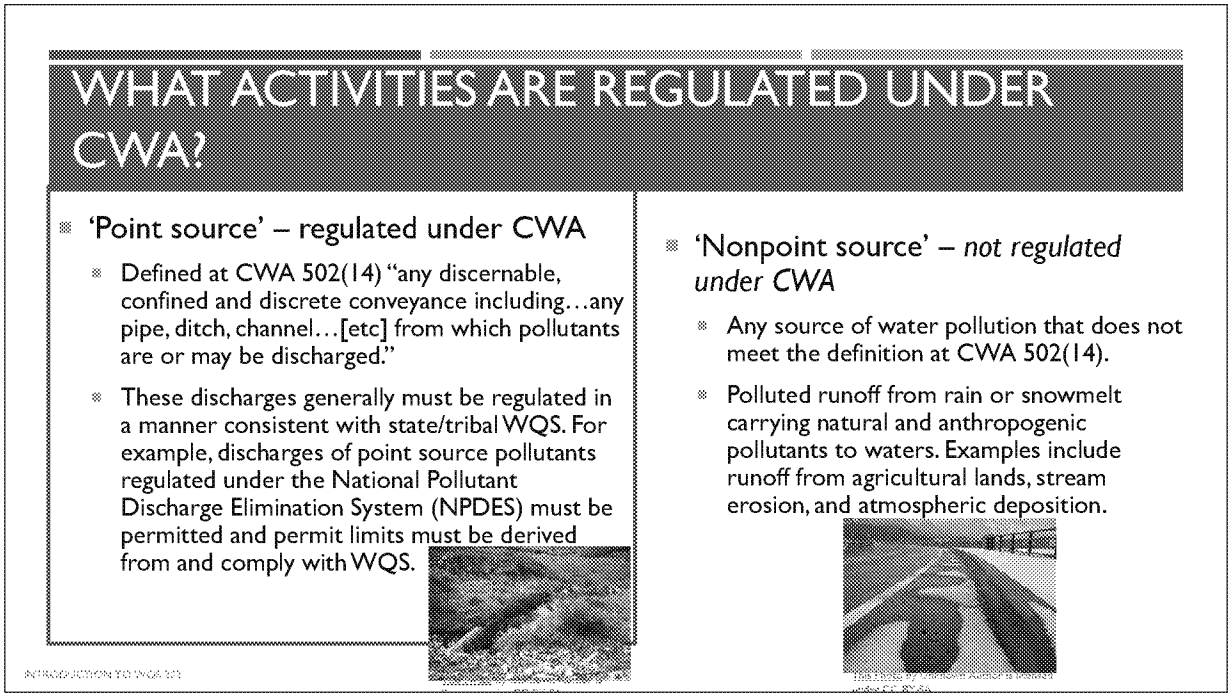
KEY CWA SECTIONS

The following are key sections that outline a portion of the major implementation programs. The first number of the section indicates the title of the Act in which that section is located.

- CWA 101 - Goals and Policy
- CWA 301 - Technology Based Effluent Limits
- CWA 302 - Water Quality Based Effluent Limits
- CWA 303 - Water Quality Standards and Implementation
- CWA 319 - Non-point Source Management
- CWA 401 - State/Tribal Certification
- CWA 402 - Point Source Permitting (NPDES)
- CWA 502 - Definitions: Navigable, Pollutant…
- CWA 510 - State/Tribal Authority
- CWA 518 - Indian Tribes

Here are some key sections of the CWA that outline some of (but not all) the major implementation programs. The first number of the section indicates the title of the Act in which that section is located, so "Section 303" is part of Title 3 of the Act.

Section 101 outlines the major goals as we saw a couple of slides ago.
Section 502 has definitions that apply throughout the Act.
Section 303 outlines the requirements for water quality standards, and provides the basis for EPA's WQS regulation at 40 CFR part 131
Section 402 outlines the requirements for point source permitting under National Pollutant Discharge Elimination System (NPDES), and 301 and 302 are related to developing effluent limits for such permits.
Section 319 talks about management for nonpoint source pollution, that is pollution not managed under Clean Water Act permits. It tasks states and authorized tribes to develop management plans and EPA to award grants for that management. The Clean Water Act does not provide direct regulatory authority over nonpoint sources of pollution.
Sections 401, 510 and 518 talk about roles of states and of tribes, which are somewhat different.



The Clean Water Act provides for direct regulation of activities related to "point source discharges." The Clean Water Act defines a point source as "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged."

One example of an activity where point source discharges can affect water quality, and where water quality standards can drive decisions are NPDES permits to discharge pollutants from a point source into Waters of the U.S. This type of discharge, and the permitting process for it, are discussed in Section 402 of the Clean Water Act. Remember, point source discharges include discharges from publicly owned treatment works, or "POTWs" for short, industrial wastewater, stormwater runoff through a storm sewer system, and concentrated animal feeding operations (or CAFOs). Another example is permits for operations that may result in discharge of dredged or fill material to Waters of the U.S., and the permitting process for it, which are discussed in Section 404 of the Clean Water Act. A final example is permits or licenses for Federal facilities that may result in discharge to Waters of the U.S. and the certification process for it which are discussed in Section 401 of the Clean Water Act.

Non-point source pollution is any source of water pollution that does not meet the legal definition of "point source" in Clean Water Act Section 402. Essentially, non-point source pollution is something that does not come out of a discrete conveyance like a pipe, channel, etc.

Non-point source pollution often cannot be tied to a single source. It occurs when rainfall, snowmelt, or irrigation runs over land or through the ground, picks up pollutants, and deposits them into rivers, lakes, or the ocean. It is well documented that these pollutants can have harmful effects on drinking water supplies, recreation, fisheries, and wildlife. Though the relative impact from a few non-point sources might be small, the cumulative impact from many non-point sources degrades water quality.

The Act does not regulate non-point sources of pollution. But to address non-point sources, the 1987 amendments to the Clean Water Act established the Section 319 Non-Point Source Management Program.

Overview

CWA'S TWO APPROACHES TO MAINTAIN AND PROTECT WATER QUALITY

Technology-based Approach

- **Goal:** Achieve a specific level of end-of-pipe performance.
- **Focuses on:** meeting limits derived from levels that EPA expects each type of industrial & municipal discharger to achieve for specific pollutants based on the performance of treatment and control technologies.
- Calculate technology-based effluent limits (TBELs) derived from federal effluent guidelines.
- CWA 301; 40 CFR 122.44(a) & (e); 40 CFR 125.3, 40 CFR 405-471

Water Quality-based Approach

- **Goal:** Meet water quality standards (WQS) in the receiving water.
- **Focuses on:** meeting limits based on what is needed to achieve water quality standards that apply to the ambient receiving water and are derived on a case by case basis.
- Calculate water quality-based effluent limits (WQBELs) derived from WQS which are applied to the water body.
- CWA 302; 40 CFR 122.44(d), 40 CFR 131-132

The CWA outlines 2 different but complementary types of protection, technology-based and water quality-based.

The technology-based approach focuses on what each type of discharger can achieve for specific pollutants based on the performance of treatment and control technologies and does not look at the impacts of those pollutants on receiving waters. Permit writers calculate "technology based effluent limits" (or "TBELS") for dischargers.

TBELs are derived from effluent guidelines that serve as national standards for wastewater discharges to surface waters and publicly owned treatment works (municipal sewage treatment plants). These federal effluent guidelines are for regulating different types of industries and provide the performance standards they must meet. To calculate the tech-based limits, you can look up those numbers in the CFR. You can think of TBELs as intended to level the playing field across the country, so that the same end of pipe limits are expected across the same industrial groups, and you won't end up with some states allowing less stringency and becoming de facto "pollution havens."

The water quality based approach focuses on meeting limits based on what is needed to achieve WQS that apply to the ambient receiving water and are derived on a case by case basis. Under the water quality approach, we calculate water quality based effluent limits, or WQBELs, for discharge permits. WQBELs are derived from WQS which are applied to the waterbody.

But the boiled down version for these two approaches is that for permitting discharges of pollutants to waters of the US, you need to meet the more stringent of the tech based or water quality based approach. Permit writers calculate what limits would be placed on a facility to meet each of these, ultimately the more stringent of the two ends up being the one that the permittee needs to meet (though they are both technically in the permit.)

For the rest of this presentation, we'll be focusing on the water quality based approach, but I wanted to make sure that you were aware that the CWA set up this two-approach system.

Overview

WATER QUALITY STANDARDS

CWA 303: BASIS FOR WATER QUALITY STANDARDS

- WQS define the water quality goals for a waterbody.
- WQS provide a regulatory basis for many actions, e.g.,
  - Reporting on water quality conditions and status.
  - Developing water quality-based effluent limits in National Pollutant Discharge Elimination System (NPDES) permits for point sources.
  - Setting targets for Total Maximum Daily Loads (TMDLs).
- An important function of WQS is to provide a regulatory basis for the water quality management activities authorized under the CWA.

The Clean Water Act sets out expectations for Water Quality Standards in Section 303. Water quality standards are the goals for a waterbody. They describe: "where we want to get to"; "what we are going to manage our programs to attain"; "what we want our water quality to be"; and the "level of protection" we want for a given waterbody.

Probably the most important function of water quality standards is to provide a regulatory basis for the many water quality management actions in the Clean Water Act, for example reporting on water quality conditions through assessment and listing, or developing water quality based effluent limits in NPDES permits. Water quality standards drive management action beyond just installing available pollution control technologies in facilities that discharge pollutants. That alone is not always good enough to meet the goals of the Clean Water Act.

REGULATION: WATER QUALITY STANDARDS

- Water quality standards (WQS) are the core of water quality management programs.
- States, territories and authorized tribes adopt WQS to protect public health or welfare, enhance the quality of the water, and serve the purposes of the Clean Water Act including sections101(a) and 101(a)(2).
- State/Territorial/Tribal WQS establish water quality goals for a water body and provide a regulatory basis for controls.
- The current federal regulation is in the Code of Federal Regulations (CFR) part 131, as well as part 132 for the Great Lakes area. The federal regulation contains procedures for developing, revising, and approving state and tribal-adopted WQS and for promulgation of state and tribal WQS by EPA.
- EPA-approved state and tribal WQS can be supplemented by other state or tribal programs.

The Water Quality Standards program is a joint effort between states or authorized tribes, and EPA. Water quality standards are the core of water quality management programs and establish the water quality goals for a water body. Water quality standards provide a regulatory basis for controls which may require effluent limits more stringent than the technology based effluent limits.

States, territories and authorized tribes adopt WQS to protect public health or welfare, enhance the quality of the water, and serve the purposes of the Clean Water Act including sections101(a) and 101(a)(2).

State/Territorial/Tribal water quality standards establish water quality goals for a water body and provide a regulatory basis for controls.

The current federal regulation implementing the water quality standards requirements became effective in October 2015, and it is codified in Title 40 of the Code of Federal Regulations (or CFR), Part 131. The Part 131 and 132 regulations contain the requirements and procedures for developing, revising, and approving state and tribal-adopted water quality standards and for promulgation of state and tribal standards by EPA.

For any who are curious about the history, the Water Quality Standards program was created by the Water Quality Act of 1965 and was expanded by the 1972 amendments to the Clean Water Act (or the 'modern' Clean Water Act). The first federal Water Quality Standards regulation was published in 1983. EPA most recently amended the regulation in 2015.

While states, tribes and territories are in the driver's seat as far as adopting their own WQS, EPA has an oversight function, because EPA has authority to approve or disapprove WQS. Note that since 2000, any new or revised water quality standards must be approved by EPA to be effective for Clean Water Act purposes.

States, authorized tribes, and territories have the discretion to go above and beyond the EPA regulatory requirements, and EPA-approved state and tribal water quality standards can be supplemented by other state or tribal programs.

Overview

COMPONENTS OF WQS

- WQS consist of 3 core components:
  - Designated uses (sometimes known as "beneficial uses"),
  - Criteria to protect those uses, and
  - Antidegradation requirements.
- Additional components: general policies (e.g., low flow provisions, mixing zone policies) (40 CFR 131.13), WQS variances (40 CFR 131.14), compliance schedule authorizing provisions (40 CFR 131.15).

Now that we know the regulatory framework for water quality standards, what do water quality standards look like?

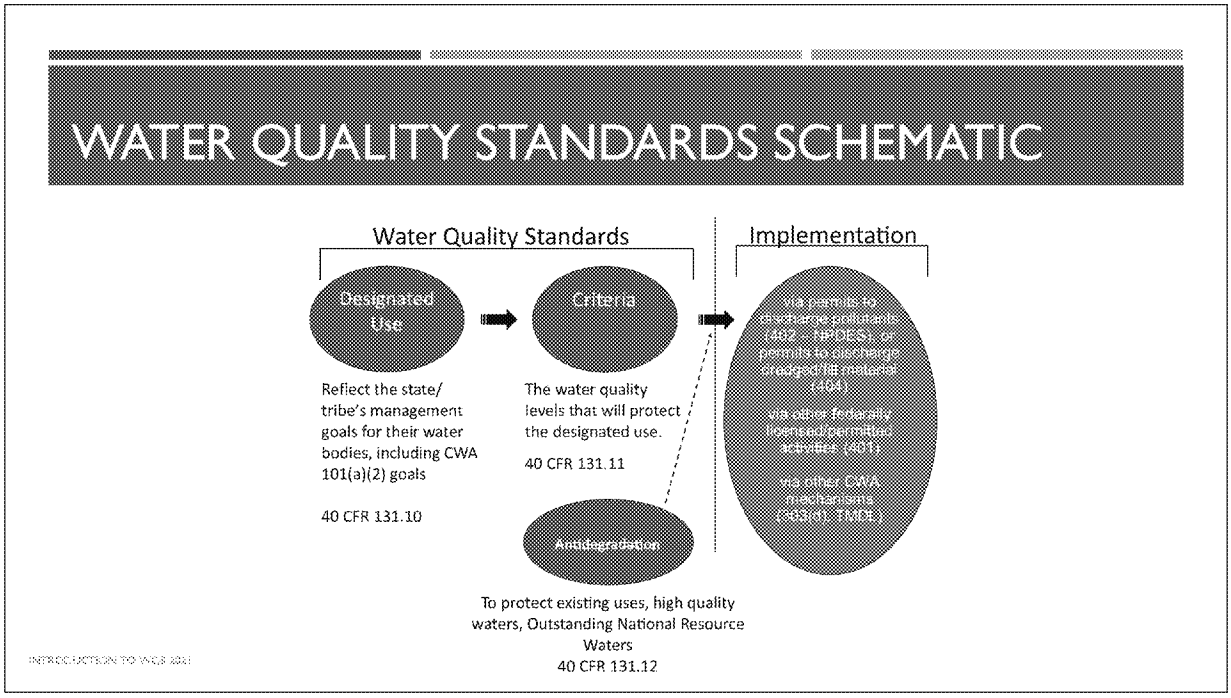
Water quality standards consist of 3 core components, which state and tribal WQS must contain..
These three components are created with the 101(a) and 101(a)(2) Clean Water Act goals in mind to:
-"restore and maintain the chemical, physical, and biological integrity of the Nation's waters," and;
-"wherever attainable, achieve a level of water quality that provide for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water".

First, we need to define the goals for the water body, otherwise we wouldn't know what levels of a pollutant would be protective. States and authorized tribes do this by designating uses.

Second, we need to define how to protect the designated uses by describing limits for pollutants that would prevent attainment of those uses. States and authorized tribes do this by assigning criteria to protect the designated uses.

Third, states and authorized tribes have structures for additional protections for existing water quality and high water quality, under the antidegradation requirements.

Every state and authorized tribe with water quality standards has these 3 required components. They may choose to include additional components as well. While these components are not required to be included in WQS, to the extent that they are included, EPA has authority to approve or disapprove just as for the core components.



Here is a schematic of the three main components of water quality standards and how they work together and then get implemented through other Clean Water Act programs.

Let's start on the left-hand side with water quality standards. A state or authorized tribe's water quality standards are made up of three basic components: designated uses, criteria, and antidegradation regulations, all of which will be discussed in detail in the next few slides.

After the vertical line we have Implementation of these standards, through on the ground programs.
A permit limit is a limitation on the pollutants that can be discharged into water body. It is set by the National Pollutant Discharge Elimination System (or NPDES) permitting authority.
Permit limits must derive from and comply with water quality standards.
Permit writers need to look at the criteria to ensure permit limits will comply with water quality standards.

Two other ways water quality standards come into play is through Section 401 certification of federally licensed/permitted activities., and through Total Maximum Daily Loads, or TMDLs.

State and authorized tribes may also have their own specific mechanisms to enforce water quality standards in addition to the NPDES and TMDL implementation tools.

That's the basic system of how water quality standards fit in with programs that implement them.

Overview

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DESIGNATED USES (40 CFR 131.10)

- Designated uses are those uses specified in [states' and authorized tribes'] water quality standards [regulations] for each water body or segment, whether or not they are being attained.
- They describe the water quality goals or desired condition for a specific water body, and the functions and/or activities that are supported by a level of water quality.
- They also serve as tools to communicate water quality goals to the public.

The first component of the Water Quality Standards program is designated uses. Designated uses describe the desired condition of a waterbody and can be aspirational. They don't need to be attained right now, they could be a goal for the future.

Note that designated uses should be considered a tool to help communicate a state's/tribe's water quality goals to the public. Designated uses are typically narrative and can be described in ways that people can easily visualize.

Overview

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WHAT DOES THE CWA SAY ABOUT USES?

- CWA 303 (c)(2)(a): water quality standards shall serve the purposes of the [Act] and "shall be established taking into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes, and…navigation."
- CWA 101(a)(2) sets a national goal that, "wherever attainable…water quality which provides for the protection and propagation of fish, shellfish and wildlife, and…recreation in and on the water…"
  - **"Uses specified in section 101(a)(2) of the Act" -**
    - Protection and propagation of fish, shellfish and wildlife
    - Recreation in and on the water
  - "**Non-101(a)(2) uses**": Any uses not related to the protection and propagation of fish, shellfish, wildlife or recreation in and on the water (40 CFR 131.3(q).
- The WQS regulations at 40 CFR Part 131 interpret the CWA to effectively establish a "rebuttable presumption" that CWA 101 (a)(2) uses are attainable and must be designated. If a state or tribe disagrees, they may demonstrate that such uses are not attainable through a Use Attainability Analysis (UAA)
- States and tribes are not required to designate non 101(a)(2) uses but their use and value must be considered.

INTRODUCTION TO WQS 2011

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WQSA: Module 3 - Designated Uses

Clean Water Act 303(c)(2)(A) says that states and authorized tribes must establish uses for their waters taking into consideration their use and value for:
-propagation of fish and wildlife, recreational purposes
- public drinking water supplies; and
-agricultural, industrial, cooling, and other purposes, including navigation.

Section 101(a)(2) of the Clean Water Act specifies – "it is a national goal" and "water quality provides for" "Protection and propagation of fish, shellfish, and wildlife...and recreation in and on the water". They are commonly expressed as the "fishable/swimmable" goals of the Clean Water Act, or the "uses specified in Section 101(a)(2) of the Act".

The phrase "protection and propagation of fish, shellfish, and wildlife" is often shorthanded to "aquatic life." This includes protection of aquatic life directly as well as protection of human health when consuming aquatic life (EPA has made this statement publicly in a variety of places, most recently in the preamble to the Part 131. revisions in 2015).

The phrase "recreation in and on the water" is often shorthanded to "primary contact recreation" because it includes activities that reflect recreation "in and on" the water – i.e., swimming, surfing, or other activities where immersion and ingestion are likely. Such activities are usually protected by a "primary contact recreation use"

Note that Congress put a higher bar for those uses specified in CWA section 101(a)(2) than any other uses mentioned in CWA 303(c) by "provided for" (i.e., designated) unless demonstrated to be unattainable, effectively creating a rebuttable presumption. Non 101(a)(2) uses, on the other hand, do not have to be designated but must at least be considered.

It is important to note here that use designations aren't automatic. The state or authorized tribe has to specifically designate their designated uses to express their goals; if they don't designate a use, there is no 'default'.

You cannot designate a water of the U.S. for waste transport or assimilation. That is specifically prohibited by Clean Water Act.

DESIGNATED USES-STATE/TRIBAL ROLES (40 CFR 131.10)

- States and authorized tribes must specifically identify designated uses to express their goals.
  - There are no federal "default" designated uses.
- States and authorized tribes have discretion in designating uses and how to articulate them as long as the system established allows protection of waters consistent with the CWA and regulations.
- States and authorized tribes can designate multiple uses for each water body.
- States and authorized tribes must take into account downstream protection when designating uses.

States must specifically identify designated uses to express their goals. There are no federal defaults to automatically apply if a state fails to do so.

States and authorized tribes have the discretion in designating uses. They do not need to be constrained by the wording or the use categories articulated in the Clean Water Act, but can come up with their own categories of uses. Not all states or authorized tribes have the same designated use categories. For example, some may say "recreation" or "water contact recreation" or "whole body contact recreation" while others may say "Class 1 waters" or "Class A waters".

States can and usually do designated multiple uses for each water.

Because waters are connected, EPA's Water Quality Standards regulations (and NPDES regulations) also require consideration of downstream protection.

Overview

EXAMPLES OF DESIGNATED USE APPROACHES

State A	State B
Specifically designates multiple uses to each water.	Designates a "class" that contains multiple different uses.
For example, one water body designated for: Warm water aquatic life use, Public water supply use, Agricultural use, and Primary contact recreation use	For example, designations may be: Class A(1): - Aquatic biota, wildlife and aquatic habitat use - Aesthetics use - Swimming and other primary contact recreation use - Boating, fishing and other recreation use Class A(2) - Includes Class A(1) + Public Water Supply Class B - Includes Class A(1), Class A(2), + irrigation of crops and other agricultural uses

Creation of a use designation system is the state or authorized tribe's choice. EPA has no specific recommended way of designating waters. The basic water uses mentioned in the Clean Water Act at 101(a)(2) should, however, be reflected in state and tribal use designation systems to allow states/tribes to designate waters consistent with the CWA and implementing regulations.

This slide shows a couple of examples of approaches a state or authorized tribe may take to designate uses. There are two ways that we have seen states and authorized tribes designate their waters; (1) they either use a designation system where they specifically designate multiple uses to each water (as in example State A on this slide; or they use a classification system where they designate a class but that class contains multiple different uses (as in example State B on this slide).

Overview

WQSA May 2016

REVISING DESIGNATED USES

- Sometimes the designated uses and criteria need to be adjusted to reflect that the underlying WQS is not attainable.
- Except in certain circumstances, designated uses can be revised to reflect:
  - **More specific** desired condition (e.g., aquatic life use to cold water- or warm water-aquatic life use).
  - Clearer articulation of the **attainable** use (e.g. primary vs secondary contact recreation use).
- Revising designated uses can lead to more effective criteria, permits, TMDLs.
- Evaluation of the use and value for that use is generally required by a state/tribe wishing to make a revision, but Congress intended more prescriptive requirements for revising uses related to CWA 101(a)(2) uses.
  - For CWA 101(a)(2) uses, revisions must be accompanied by a UAA (a "structured scientific assessment of the physical, chemical, biological and economic factors affecting attainment of the use.")

Sometimes the designated uses and criteria need to be adjusted to reflect that the underlying WQS is not attainable. While there are certain circumstances where a use cannot be removed, Clean Water Act Section 101(a)(2) allows for circumstances where a designated use may not be attainable in a water body, and therefore the use may be removed.

Designated uses can be revised to reflect:

A more specific desired condition (for example: revising a more general aquatic life use to a cold water- or warm water-aquatic life use),

Or a clearer articulation of the attainable use (for example: a primary versus secondary-contact recreation use).

Revising designated uses can lead to more effective criteria, permits, and TMDLs.

The rationale needed depends on the use a state or authorized tribe wishes to revise. Evaluation of the use and value for that use is generally required, but Congress intended more prescriptive requirements for revising uses related to 101(a)(2) uses (i.e., a Use Attainability Analysis or UAA). A UAA is a "structured scientific assessment of the physical, chemical, biological and economic factors affecting the attainment of the use."
We will talk about those requirements next.

REVISING DESIGNATED USES: USE ATTAINABILITY ANALYSIS (UAA)

- When revising uses specified in CWA 101(a)(2), revisions must be accompanied by a UAA, which is a "structured scientific assessment of the physical, chemical, biological and economic factors affecting attainment of the use.").
  - *EPA does not act on UAAs, but can and should work closely with states and authorized tribes prior to submission to provide input.*
  - A UAA must identify a factor precluding the attainment of the use. EPA specifies 6 factors that can be used to demonstrate that a use is not attainable- "131.10(g) factors."
  - After completing a required UAA a state/authorized tribe must adopt the highest attainable use (HAU) and the criteria to protect the HAU.
    - Highest attainable use (HAU) is the "modified aquatic life, wildlife, or recreation use that is both closest to the uses specified in section 101(a)(2) of the Act and attainable, based on the evaluation of the factor(s) in § 131.10(g) that preclude(s) attainment of the use and any other information or analyses that were used to evaluate attainability." (40 CFR 131.3(m))

INTRODUCTION TO CWA 101

For situations where a state or authorized tribe seeks to revise a Clean Water Act Section 101a2 use, they need to conduct a Use Attainability Analysis or UAA. A UAA is a "structured scientific assessment of the physical, chemical, biological and economic factors affecting the attainment of the use." UAAs provide the required rationale when adopting revised 101a2 uses. EPA does NOT act on UAAs, but rather acts on the use change itself. However, EPA can (and often does) work closely with states and authorized tribes prior to the state or authorized tribe's submission to provide preliminary input and advice on a UAA and use change.

When EPA considers approving a state or authorized tribe's designated use change, for a use specified in Section 101(a)(2) or a subcategory of such a use, it looks for a UAA connecting the need for a use change directly to one or more of the 6 factors mentioned in Section 131.10g of the Water Quality Standards regulation. These factors include natural and non-natural reasons why a designated use might not be attainable. We will go over the factors in a moment.

After completing a required UAA, a state or authorized tribe must adopt the highest attainable use, or HAU, and the criteria to protect the HAU. The HAU is the best level you can get to in the water body, the level that is still attainable. Removing the entire category of use (such as removing every aspect of the aquatic life use) when some level of use is still feasible to attain, or adopting a use that is less than the HAU, could result in the adoption of criteria that inappropriately lowers water quality and could adversely affect aquatic ecosystems and the health of the public recreating in and on such waters. This would be inconsistent with the CWA objective to strive towards restoring and maintaining the physical, chemical and biological integrity of the nation's waters.

HAU is defined in the WQS regulation as the "modified aquatic life, wildlife, or recreation use that is both closest to the uses specified in section 101(a)(2) of the Act and attainable, based on the evaluation of the factor(s) in § 131.10(g) that preclude(s) attainment of the use and any other information or analyses that were used to evaluate attainability." (40 CFR 131.3(m))

It is important to note that although a UAA is not required to remove a non-101a2 use, such as public water supply or irrigation, one certainly can be used to fulfill the required rationale to remove such a use. The state must provide a "use and value demonstration" at a minimum.
of use (such as removing every aspect of the aquatic life use) when some level of use is still feasible to attain, or adopting a use that is less than the HAU, could result in the adoption of criteria that inappropriately lowers water quality and could adversely affect aquatic ecosystems and the health of the public recreating in and on such waters. This would be inconsistent with the CWA objective to strive towards restoring and maintaining the physical, chemical and biological integrity of the nation's waters.

It is important to note that although a UAA is not required to remove a non-101a2 use, such as public water supply or irrigation, one certainly can be used to fulfill the required rationale to remove such a use. The state must provide a "use and value demonstration" at a minimum.

REVISING DESIGNATED USES: THE 131.10(G) FACTORS

1. **Naturally occurring** pollutant concentrations prevent the attainment of the use.
2. **Natural, ephemeral, intermittent or low flow conditions or water levels** prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met.
3. **Human caused conditions or sources of pollution** prevent the attainment of the use and **cannot be remedied or would cause more environmental damage to correct** than to leave in place.
4. Dams, diversions, or other types of **hydrologic modifications** preclude the attainment of the use and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use.
5. **Physical conditions related to the natural features** of the water body such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, **preclude attainment of aquatic life protection uses**.
6. Controls more stringent than those required by sections 301(b) and 306 of the Act would result in **substantial and widespread economic and social impact.**

At least 1 of these factors must be satisfied to justify removal of the 101a2 use.

Some factors address natural issues, some address non-natural issues, and some factors can be used for either or both.

REVISING DESIGNATED USES: USE ATTAINABILITY ANALYSIS (UAA) 131.10(J) AND 131.10(K)

- A UAA is required:
  - before removing CWA 101(a)(2) uses, and subcategories of such uses, and
  - when designating for the first time, uses that do NOT include CWA 101(a)(2) uses or when adopting subcategories of such uses with less stringent criteria.
- A UAA is not required:
  - when designating a CWA 101(a)(2) use for the first time,
  - when designating a subcategory of a CWA 101(a)(2) use that requires criteria at least as stringent as previously applicable, and
  - before removing or revising non-101(a)(2) uses. However, must justify how consideration of the use and value of such uses supports the action (i.e., "Use and Value" Demonstration).

The WQS regulations at 40 CFR 131.10(j) articulate that

A State must conduct a use attainability analysis whenever:

The State wishes to remove a designated use that is specified in section 101(a)(2) of the Act, to remove a sub-category of such a use, or to designate a sub-category of such a use that requires criteria less stringent than previously applicable.
or
The State designates for the first time, or has previously designated for a water body, uses that do not include the uses specified in section 101(a)(2) of the Act.

131.10k articulates that

A UAA is not required: -when Designating a use that is specified in CWA 101(a)(2) for the first time.
-when Designating a subcategory of a 101(a)(2) use that requires criteria at least as stringent as previously applicable.
-before removing or revising non 101(a)(2) uses. However, you must justify how consideration of the use and value of such uses supports the action (i.e., "Use and Value" Demonstration).

WATER QUALITY CRITERIA
40 CFR 131.11

- Criteria are the water quality levels that will protect the designated use.
- Definition (40 CFR 131.3(b)): "Elements of State water quality standards, expressed as constituent concentrations, levels or narrative statements, representing water quality that supports a particular designated use. When criteria are met, water quality will generally protect the designated use."

The second core component of the Water Quality Standards program is water quality criteria. Water quality criteria are limits on a particular pollutant or limits on a condition of a water body designed to protect and support a designated use. 40 CFR 131.3 says that when criteria are met, water quality will generally protect the designated use. So, when appropriate criteria are selected for a particular waterbody, and when water quality in that waterbody meets all the criteria, the designated use should be protected.

States and authorized tribes adopt water quality criteria as part of their water quality standards. They consider which criteria are needed to protect the designated use and then incorporate these criteria into their water quality standards.

Overview

CWA REQUIREMENTS FOR CRITERIA

- CWA 303(c)(1): "States/Tribes shall adopt criteria to protect designated uses into their WQS."
- CWA 303(c)(2)(b): "States/Tribes shall adopt criteria for "priority pollutants" (a list of "toxic pollutants" from a Congressional committee report referenced in *CWA 307(a)*).

The Clean Water Act requirements for criteria are in two different places.

Clean Water Act section 303(c)(1) requires states and authorized tribes to adopt criteria to protect designated uses into their water quality standards. That's the general requirement.

There's also a more specific requirement for a specific list of over 100 pollutants, that states and authorized tribes shall adopt criteria for those pollutants into their water quality standards. These are called 'priority pollutants" or "toxic pollutants," and the list was generated based on litigation that resulted in a list. The list is based on legal and policy decisions and contains many legacy pollutants, such as DDT.

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Intro to Criteria

WQS REGULATORY REQUIREMENTS FOR CRITERIA

- WQS regulation at 40 CFR 131.11: "States/Tribes must adopt those water quality criteria to that protect the designated use."
  - Criteria must be based on sound scientific rationale.
    - EPA produces national water quality criteria *recommendations* under CWA 304(a) (these are recommendations, not Federal rules).
    - Factors such as technological feasibility, social and economic costs, and the benefits of achieving criteria levels are not considered in criteria development.
    - Criteria may be revised as new scientific data or methodologies are developed.
  - Criteria must contain sufficient parameters or constituents to protect the designated use.
  - For waters with multiple use designations, the criteria shall support the most sensitive use.
    - EPA encourages states and tribes to reach out to the local communities to learn how they use particular water bodies. This information will help make more informed decisions on how to support the most sensitive use.

The Water Quality Standards regulation gives more details to implement the Clean Water Act requirements that pertain to criteria.

Criteria must be based on sound scientific rationale.

EPA produces national water quality criteria recommendations under Section 304(a) of the Act. These criteria recommendations are often used as the basis for state or tribal water quality standards. However, the regulation allows the states and authorized tribes to develop their own criteria or make site-specific modifications to EPA's recommendations. The 304(a) criteria are scientific recommendations and are not Federal rules.

States and authorized tribes may not consider other factors, such as technological feasibility, social and economic costs, and the benefits of achieving criteria levels in criteria development.

Criteria may be revised from time to time as new scientific data or methodologies are developed.

Criteria must contain sufficient parameters to protect the designated use. This means, make sure that the parameters relevant to the designated uses of the water are considered. For example, if the use is 'human recreation' but the only criteria are for nitrogen and phosphorus, you're missing something...you need bacteria criteria to help protect people recreating in the water from getting gastrointestinal illnesses.

For waters with multiple use designations, the criteria shall support the most sensitive use. Most waters have more than one use. Criteria for a parameter can depend on the use – for example, aquatic life are less sensitive to something like Dieldrin (a pesticide) than humans (if humans eat fish from the water and consume the water). So, if you have both aquatic life and shellfish harvesting uses, you want to implement the criterion which would protect both uses. It's not always that one particular use is the most sensitive. It could be that aquatic life is more sensitive to one pollutant while human health is more sensitive to another. EPA encourages states, territories and authorized tribes to reach out to the local communities and learn how they use the water body. This information will help you to make more informed decisions that support the most sensitive use. For example, learn if you have an immigrant or indigenous population that practices subsistence fishing.

TWO FORMS OF CRITERIA

- **Numeric** – 40 CFR 131.11(b) provides that states/tribes should establish numeric values based on:
  - EPA's 304(a) national recommended water quality criteria,
    - Recommendations developed by EPA based on the latest scientific knowledge, issued periodically as guidance to states/tribes for use in developing their own criteria.
    - NOTE: EPA typically uses these as basis for promulgation if necessary.
  - 304(a) recommendations modified to reflect site-specific conditions, or
  - Other scientifically defensible methods.
- **Narrative** – states/tribes should establish narrative criteria
  - Where numeric criteria cannot be established, or
  - To supplement numeric criteria.

❖ Both numeric and narrative forms of criteria provide a regulatory basis for implementation and management actions like NPDES permit limits.

EPA's WQS regulation allows for both numeric and narrative criteria. While states and authorized tribes will often use EPA's 304(a) criteria recommendations when adopting state/tribal WQS, it is important to recognize that the regulations provide multiple options for establishing criteria.

40 CFR 131.11(b) states that states and authorized tribes should establish numeric values based on:
EPA's 304(a) national recommended water quality criteria.
304 criteria are recommendations developed by EPA based on the latest scientific knowledge, issued periodically as guidance to states/tribes for use in developing their own criteria. Note that the number 304a indicates the section of the Clean Water Act that directed EPA to develop these recommendations.
NOTE: EPA will use these as basis for promulgation if necessary.
States and authorized tribes can also modify 304(a) recommendations modified to reflect site-specific conditions, or they can use other scientifically defensible methods.

The Water Quality Standards regulations allow for narrative criteria:
Where numeric criteria cannot be established, or
To supplement numeric criteria.

Both forms of criteria provide a regulatory basis for implementation and management actions like NPDES permit limits, water quality assessments and TMDL development.

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Overview

NARRATIVE CRITERIA

- Example:

"Surface waters *shall be free from* substances attributable to wastewater discharges or other pollutant sources that cause injury to, or are toxic to, or produce adverse physiological responses in humans, animals, or plants."

Note: For CWA 307(a) toxics, a state/tribe must provide a method of translating a narrative criterion into something numeric from which a permit writer can derive effluent limits (40 CFR 131.11(a)(2)).

Folks are generally familiar with numeric criteria, but let's look for a moment at an example of narrative criteria so you'll know what I'm referring to.

Narrative criteria exist in all states' WQS and often include the term "free from," like this example. Another common example is "no toxics in toxic amounts."

Narrative criteria provide a qualitative benchmark for assessing water quality. They are useful as indicators of water quality when a numeric criterion is either not available or cannot be applied; for example, when particular pollutants or water conditions cannot be precisely measured.

EPA's view is that effective State and Tribal water quality standards should include both numeric and narrative criteria. The use of both ensures that a water is fully protected for both chemical specific effects and the effects of mixtures of chemicals or other less measurable pollutants (e.g., floatable debris, objectionable deposits). AND when there are no numeric criteria or 304a recommendations for a particular pollutant that may be present.

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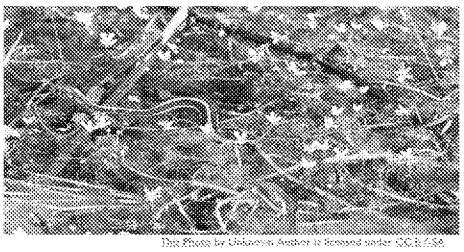
Intro to Criteria

TYPES OF CRITERIA

- Aquatic life
- Biological
- Human health
- Recreational
- Nutrient
- Other (e.g., hydrologic, sediment)



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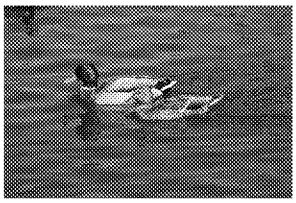

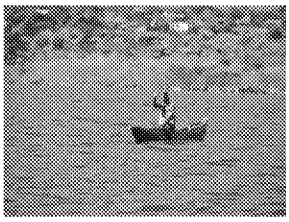

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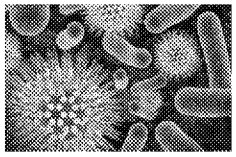

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EPA's water quality recommendations under Clean Water Act Section 304(a) include the various types of water quality criteria. Each type has a different protective focus:

Aquatic life criteria protect aquatic life from specific chemical pollutants in the water column. In addition to typical surface waters, EPA recommendations are largely applicable to wetlands, but some may need adjustments, for example, because of natural factors such as pH.
Biological criteria describe the desired biological condition of a water (using for example, a fish index, macroinvertebrate index or diatom index)
Human health criteria protect humans from specific chemical pollutants in both water and fish tissue.
Recreational criteria protect humans for uses like primary contact recreation or swimming
Nutrient criteria protect aquatic life and source water for public water supplies and/or recreation.
Other types of criteria may also be included in state WQS

TYPES OF CRITERIA

- Different types of water quality criteria are complementary. There is no one type of criteria that will guarantee protection of all designated uses.
- Ideally all types of water quality criteria are considered when setting standards and evaluating the condition of a waterbody.
- Different types of water quality criteria collectively provide a valuable tool for setting standards and making water quality management decisions that help protect the broad diversity of life affected by water pollutants.

Because of their different protective focuses, these different types of water quality criteria are complementary.

Since there is no single number that will guarantee protection of all forms of life, ideally all categories of water quality criteria are considered when setting standards and evaluating the condition of a waterbody. If any criterion is exceeded, there may be a potential risk to some portion of the intricate web of human, animal, and plant life connected with a waterbody.

The different types of water quality criteria collectively provide a valuable tool for setting standards and making water quality management decisions that help protect the broad diversity of life affected by water pollutants.

AQUATIC LIFE CRITERIA

- Aquatic life criteria protect aquatic life from specific pollutants in the water column.
- In addition to typical surface waters, EPA recommendations are largely applicable to wetlands, but some may need adjustments, for example because of natural factors such as pH.
- An aquatic life criterion typically contains three components:
  - **Magnitude** (or concentration) – how much of a parameter
  - **Duration** – period of time over which the instream concentration is averaged
  - **Frequency** – how often the magnitude can be exceeded

Example: "To protect the Aquatic Life Use from acute toxicity in saltwater, dissolved Zinc *shall not* exceed 90 micrograms per liter as a one hour average more than once every three years."

Let's take a look at aquatic life criteria. Aquatic life criteria are designed to protect all aquatic organisms, including both animals and plants.

In addition to typical surface waters, EPA recommendations are largely applicable to wetlands, but some may need adjustments, for example, because of natural factors such as pH.

Each aquatic life criterion refers to a particular concentration of a particular parameter in ambient water. An aquatic life criterion typically contains three components:

a concentration or magnitude (how much of the parameter),
a period of time (or duration) over which the instream concentration is averaged (for how long), and
a frequency indicating how often the average concentration can be exceeded (how often).

An example for Zinc in saltwater is included on this slide.

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Intro to Criteria

AQUATIC LIFE CRITERIA

- Aquatic life criteria usually include:
  - An acute value to protect against short exposure periods,
  - A chronic value to protect against long term exposure, and
  - Separate saltwater values and freshwater values to account for different effects depending on salinity.

Example: Dissolved Zinc Aquatic Life Criteria
For all of the below, concentrations shall not exceed the specified number as a 1 hour average (for acute) or a 4 day average (chronic) more than once every 3 years.
Saltwater acute: 90 ug/L as a 1-hour average
Saltwater chronic: 81 ug/L as a 4 day average
Freshwater acute: 120 ug/L as a 1-hour average
Freshwater chronic: 120 ug/L as a 4 day average

Haven Lake

An aquatic life criterion would contain something like a 4-day average, designed to protect against chronic (extended) exposure to lower concentrations, and a 1-hour average, designed to protect against acute (short) exposures to higher concentrations.

So, where data allow, there can in fact be four separate aquatic life criteria for a particular chemical: saltwater acute and chronic, and freshwater acute and chronic.

There are cases where we don't have one or the other (for example, a chemical that is highly bioaccumulative probably doesn't need an acute value as the chronic endpoint is far more sensitive

In some cases, the aquatic life criteria developed by EPA may actually be more stringent than necessary or not protective enough for any particular waterbody. This depends on such factors as whether the species at the site are more or less sensitive than those used to calculate the national criteria, and on whether the particular physical and chemical characteristics of the site alter the biological availability or toxicity of the chemical. In such cases, a site-specific criterion can be developed based on toxicity data for a more appropriate species water conditions at the site. That's another topic for another day!

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Intro to Criteria

BIOLOGICAL CRITERIA (OR 'BIOCRITERIA')

- Biological criteria protect aquatic life uses by describing the desired biological condition of surface waters for a specific aquatic life designated use.
- Examples:
  - Narrative: "Waters shall be free from substances in concentrations or combinations that would adversely alter the structure and function of aquatic communities, as defined by the reference condition."
  - Numeric: Class I: Cool Water Aquatic Life,
    - Taxa Richness: 5
    - EPT Index: 3

INTRODUCTION TO WQS 102

Biological criteria are based on the premise that the structure and function of an aquatic biological community within a specific type of waterbody provide critical information about the quality of surface waters.

Biological criteria are threshold levels or guidelines that describe the desired biological integrity of aquatic communities of surface waters.

For example, biological criteria may refer to relatively simple indices such as the number of different species present in a given area or the number of individuals of a given species, or to more complex properties, such as the complexity of food webs or the efficiency of nutrient cycling in the waterbody.

Biological criteria can help identify water quality degradation that cannot be identified by chemical or physical test procedures alone. Followed by a stressor identification evaluation, biological criteria can initiate the process to identify and address the cause(s) of water quality degradation.

Biological criteria are developed by the States to reflect local conditions and the designated use classification system of the State. The biological criteria must protect the designated use of the waterbody and the propagation of wildlife, fish, and shellfish. Different criteria are developed for different designated uses.

Biological criteria may be numeric or narrative expressions that describe the desired biological integrity of aquatic communities inhabiting waters of a given use category. Narrative biological criteria are general statements of attainable or attained conditions of biological integrity and water quality for a given use designation. Numeric criteria are specific quantitative indicators of that condition. You can see examples of both narrative and numeric criteria on the slide.

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Intro to Criteria

HUMAN HEALTH CRITERIA

- Human health criteria are developed to protect humans from specific pollutants in both water and fish tissue that humans might ingest.
- Calculated to protect from effects of pollutants from ingestion of aquatic organisms in the water ("org only") and for ingestion of water and organisms ("water + org").
- Expressed as a pollutant concentration based on:
  - Toxicological Assessment
  - Exposure Scenario

States and tribes also have "human health criteria" which focus on protecting humans over their lifetime from chronic exposure to pollutants. This is about protecting people not just from developing an acute immediate illness following swimming, but from things like developing cancer from lifetime exposure to a carcinogenic chemical in water. A human health criterion is the highest concentration of a pollutant in water that is not expected to pose a significant risk to human health. (Exceeding a criterion does not necessarily mean there is or will be an environmental effect - only that there is the potential for one.)

EPA publishes human health criteria recommendations for the effects of pollutants from ingestion of aquatic organisms ("org only") and for ingestion of water and the organisms ("water + org").
Human health criteria are designed to protect human health under average conditions of exposure and
do not take into account local water quality conditions, and
do not take into account potential reactions between the chemical of concern and other chemicals that could increase or reduce the toxicity of the chemical of concern.

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Intro to Criteria

RECREATIONAL CRITERIA

- Recreational criteria protect recreational designated uses (for activities including swimming, bathing, surfing, etc.).
- Designed to protect people from illnesses (including gastrointestinal, skin, eye, ear, etc. effects) due to exposure to fecal contamination in water, and kidney and liver damage due to exposure to certain cyanotoxins.
- For fecal contamination, EPA has published criteria recommendations based on epidemiological studies involving swimmers, looking at an association between water quality and illness.

States and tribes have recreational criteria to protect humans from illness or organ damage during recreational activities in water, such as swimming, surfing, kayaking.

Recreational criteria are designed to protect people from illnesses (including gastrointestinal, skin, eye, ear, etc. effects) due to exposure to fecal contamination in water, and kidney and liver damage due to exposure to certain cyanotoxins.

For fecal contamination, EPA has published criteria recommendations based on epidemiological studies involving swimmers, looking at an association between water quality and illness.

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Intro to Criteria

RECREATIONAL CRITERIA

Examples

- Fecal contamination:
  - Criteria expressed in terms of fecal indicator bacteria, for example: "A 30 day *geometric mean* of 30 colony forming units (cfu) enterococci /100 mL water, not to be exceeded, and a *statistical threshold value* of 110 cfu/100 mL for marine waters may not be exceeded in more than 10% of samples in a 30 day interval.
- Cyanotoxins:
  - Criteria expressed in terms of specific toxins, for example: "The concentration of total microcystins shall not exceed 8 µg/L in more than three ten-day periods per recreational season, for more than one recreational season, over a 5-year period."

Examples of two different types of recreational criteria are shown here. I won't read them for you, but you can see that much like aquatic life criteria, there are elements of magnitude or concentration, and time (duration and frequency)

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Intro to Criteria

NUTRIENT CRITERIA

- Nutrient criteria are numeric limits of total nitrogen and total phosphorus that protect designated uses (aquatic life, recreational, and public water supply) from the effects of eutrophication.
- Nutrient criteria are developed for different water body types using field data of nutrient concentrations (the *stressors*) and different ecological effects symptomatic of eutrophication (the *responses*).

Much of the water quality degradation around the country has been linked to nutrient over-enrichment. For example, hypoxia in the Gulf of Mexico, harmful algal blooms and fisheries degradation in the Chesapeake Bay.

States and tribes adopt nutrient criteria to protect both aquatic life and human uses of water. Nutrient criteria are numeric limits of total nitrogen and total phosphorus that protect designated uses (aquatic life, recreational, and public water supply) from the effects of eutrophication.

Nutrient criteria are developed for different water body types using field data of nutrient concentrations (the stressors) and different ecological effects symptomatic of eutrophication (the responses).

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Intro to Criteria

ANTIDEGRADATION
40 CFR 131.12

- **Policy:**
  - 40 CFR 131.12 (a): The State shall develop and adopt a statewide antidegradation policy.
  - Antidegradation adds additional protections for waters of the U.S. above and beyond designated uses and criteria. The antidegradation policy provides the goals and framework of protection.
- **Implementation Methods:**
  - 40 CFR 131.12(b): The State shall develop methods for implementing the antidegradation policy that are, at a minimum, consistent with the State's policy and with paragraph (a) of this section. The State shall provide an opportunity for public involvement during the development and any subsequent revisions of the implementation methods, and shall make the methods available to the public.
  - The antidegradation implementation method describes how the state/tribe will implement the policy.

Antidegradation is the third core element of WQS, and it's in section 131.12 of the regulation. The purpose of antidegradation is to provide a framework to implement the CWA requirements to "maintain" the chemical, physical and biological integrity of the nation's waters.

Section 131.12 describes that states and tribes shall develop and adopt an antidegradation policy that is legally binding. That policy provides additional protections for waters of the US beyond designated uses and criteria. The regulation also requires that they shall also develop antidegradation implementation methods. those may or may not be legally binding but must be available to the public and subject to public involvement.

The line between antidegradation policy and implementation methods isn't always clear. At a minimum, to be consistent with the Federal Regulation, the elements specified 40 CFR 131.12(a) must be addressed in legally binding language somewhere in state/tribal regulations.

Antidegradation

WQSA December 2016

ANTIDEGRADATION REQUIREMENTS 40 CFR 131.12 (A): POLICY

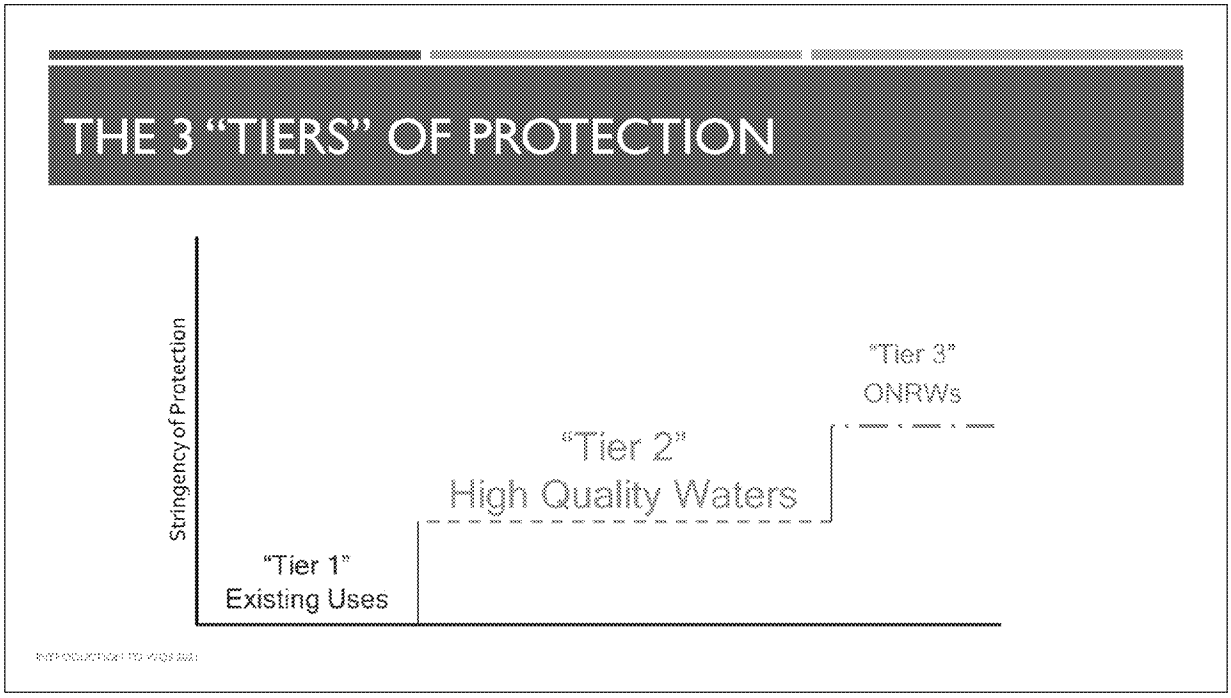
- States and authorized tribes must develop and adopt a statewide antidegradation policy that includes:
  - Protection for **existing uses** for all waters of the U.S.;
  - Protection for **high quality waters** (water quality that exceeds the levels necessary to support protection and propagation of fish, shellfish and wildlife and recreation in and on the waters);
    - Identification of High Quality Waters
    - Analysis of Alternatives
  - Protection for **Outstanding National Resource Waters** (ONRWs) identified by the state/tribe; and
  - Compliance with CWA 316 in regard to thermal discharges.

Let's talk about the policy first, and then after that we will talk about the implementation methods.

States and authorized tribes must develop and adopt a statewide antidegradation policy that includes 4 elements:
Protection for existing uses for all waters of the U.S.;
2. Protection for high quality waters (water quality that exceeds the levels necessary to support protection and propagation of fish, shellfish and wildlife and recreation in and on the waters);
Protection for Outstanding National Resource Waters (ONRWs) identified by the state/tribe; and
Compliance with CWA 316 in regard to thermal discharges.

Antidegradation

WQSA December 2016



People often refer to antidegradation as having three "tiers" of protection, like stairsteps. All waters have at least Tier 1 protection, while some waters have Tier 2 or Tier 3 protection as well. The higher the number, the more stringent the protection.

I will now explain what protection each of the 3 tiers includes.

Antidegradation

WQSA December 2016

"TIER 1" PROTECTION: EXISTING USES

- 40 CFR 131.12 (a)(1): "Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected."
- This protection applies to all waters of the U.S.

Introduction to WQSA

Tier 1 protection requires the maintenance and protection of existing uses

40 CFR 131.3(e) defines existing uses as: "those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards."

Tier 1 protection applies to all waters of the U.S. This means that waters receiving Tier 2 or 3 protection receive Tier 1 protection in addition to either Tier 2 or Tier 3 protection.

Antidegradation

WQSA December 2016

"TIER 2" PROTECTION: HIGH QUALITY WATERS

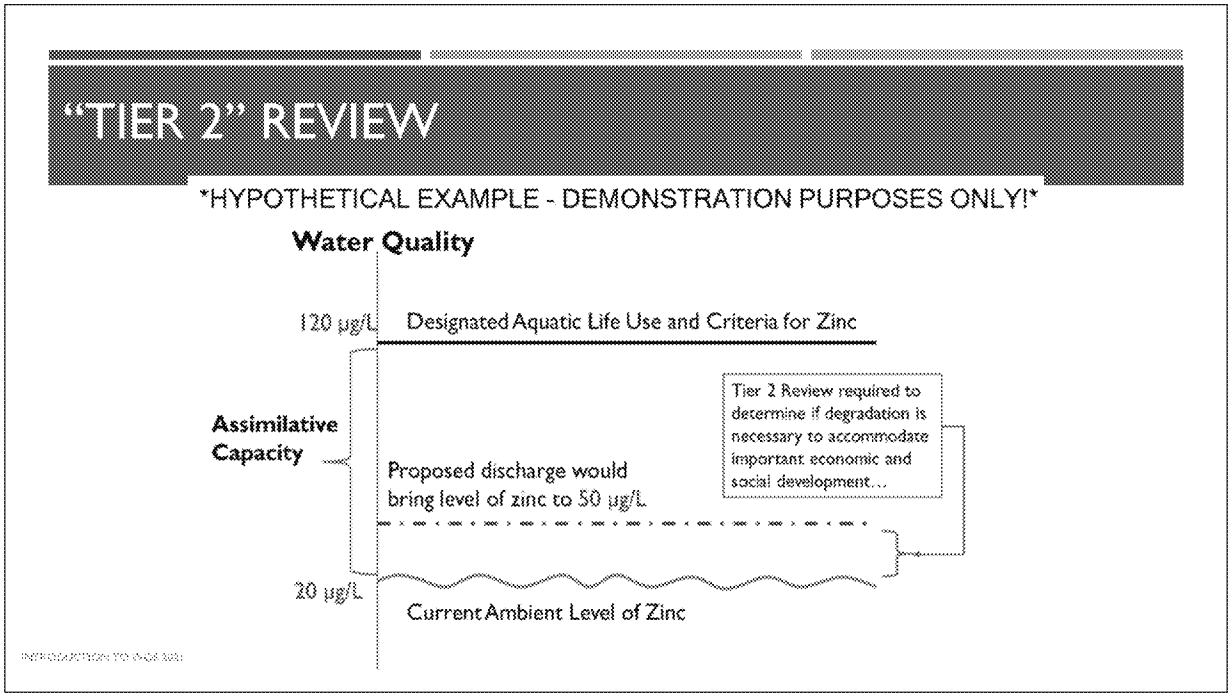
- What is Tier 2 Protection?
  - Maintenance and protection of high quality waters: waters where water quality is better than necessary to support CWA 101(a)(2) uses (protection and propagation of fish, shellfish and wildlife and recreation in and on the water.)
  - High water quality shall be maintained and protected UNLESS:
    - Use of the assimilative capacity is necessary to accommodate important economic or social development in the area in which the waters are located.
    - If this is the case, in order to allow that lowering there must be a Tier 2 Review, including analysis of alternatives, a socio-economic analysis, and public participation, to demonstrate these circumstances are met.

The regulation language for Tier 2 protection can be found at 40 CFR 131.12 (a)(2). As it is somewhat complex, the slide summarizes the main points here. Along with defining which waters will be protected and how, the regulation also lays out the requirements of a Tier 2 review.

Essentially, Tier 2 is a decision-making process for what to do with high water quality where it exists, that is, water quality better than necessary to support CWA 101a2 uses. The regulation says that high water quality shall be maintained and protected, UNLESS a finding is made that
Use of the assimilative capacity is necessary to accommodate important economic or social development in the area in which the waters are located. And,
If this is the case, in order to allow that lowering, there must be a Tier 2 Review, including public participation, to demonstrate these circumstances are met.

Antidegradation

WQSA December 2016



Tier 2 requires maintenance and protection of water quality that is better than necessary to support CWA section 101(a)(2) uses. In this hypothetical circumstance, a proposed activity would lower water quality in a high quality water because the ambient level of zinc is 20 ug/L, but the proposed activity would bring it up to 50 ug/L. This means some of the "assimilative capacity" of the water (or high water quality) would be used up.

a Tier 2 review would need to be performed before the lowering could be authorized.

WQSA December 2016

"TIER 2" REVIEW PROCESS

- Identify water bodies that will be afforded Tier 2 protection.
- Is degradation "necessary"?
  - Analysis of Alternatives
- Is the activity "important"?
  - Social/economic analysis
- Assure protection for existing uses.
  - Tier 1 protection
- Assure achievement of regulatory pollution control for point and nonpoint sources.
- Intergovernmental coordination and public participation.

Only after this process can state/tribe make a determination on whether to allow the lowering of water quality.

Let's talk about what the Tier 2 review process looks like.

First, you would need to identify water bodies that will be afforded Tier 2 protection. States have a variety of ways of doing this, and will describe it in their antidegradation policy or implementation methods.
After that, there are a couple of questions that must be asked. One question is, Is degradation "necessary"? This means, an Analysis of Alternatives to the degradation must be completed.
Another question is, Is the activity "important"? This means a Social or economic analysis must be performed.
There are other requirements as well, including that even if degradation is allowed, the water quality must still assure protection for existing uses. (that is, Tier 1 protection)
Also, you must assure achievement of regulatory pollution control for point and nonpoint sources – generally this would mean making sure that all dischargers of the relevant parameter on the receiving water are complying with their legal requirements.
And, there must be Intergovernmental coordination and public participation, because high water quality is a public good.
Only after this process can state/tribe make a determination on whether to allow the lowering of water quality.

WQSA December 2016

"TIER 3" PROTECTION: OUTSTANDING NATIONAL RESOURCE WATERS (ONRWS)

- 40 CFR 131.12 (a)(3) "Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected."
- A state/tribe can identify any water body as an ONRW.
- ONRWs typically include: waters that are viewed as pristine, highly valued waters (important to recreation or tourism), and/or waters of exceptional ecological significance (important, unique or sensitive ecologically).
- This is the most stringent protection. No degradation is allowed, except on a short term or temporary basis (weeks or months, not years).
- Some states have created a "Tier 2.5" category as a slightly less restrictive protection.

8 | INTRODUCTION TO WQS 2012

Tier 3 protection is for "outstanding national resource waters" or ONRWs. States and authorized tribes must ensure that the water quality of such waters is maintained and protected.
It's important to note that although the regulation provides some suggestions as to types of waters that could be considered for Tier 3 protection, it is up to the state or tribe to identify their Tier 3 waters themselves. EPA does not identify Tier 3 waters for states or tribes.
A state or tribe can classify any water body as an ONRW. These often include:
Waters that are viewed as pristine
Highly valued waters: important to recreation or tourism or
Water of exceptional ecological significance: important, unique, or sensitive ecologically
It is important to note that a waterbody does not have to be pristine or a high quality water in order for a state or tribe to identify the water as an ONRW. For example, a water could be of exceptional ecological significance but not yet be of sufficient water quality, thus warranting stringent protection to help maintain and restore the water body.

Tier 3 protection is the most protective of all three tiers of antidegradation protection because it does not allow any degradation. However, some states and tribes choose to allow an exception for temporary or short term degradation, to which EPA has established national policy that such temporary degradation can only be consistent with the regulations if it for weeks or months, not years. This could allow for activities such as restoration projects that will ultimately restore and/or protect water quality but will cause disruption in the short term.
Some states have created a "Tier 2.5" or "Tier 2 ½" category to provide more restrictive protection than Tier 2, without the "no degradation" restriction of Tier 3. This looks different in different states, and is at their discretion since it is not described in EPA's national regulation. When reviewing such provisions, EPA would act based on whether such provisions and decisions are consistent with Tier 2 requirements at 40 CFR 131.12(a)(2).

Antidegradation

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ANTIDEGRADATION REQUIREMENTS 40 CFR 131.12 (B): IMPLEMENTATION METHODS

- States/tribes must develop implementation methods that describe how the policy will be applied.
  - Must be consistent with and address all components of the state's/tribe's policy and EPA's regulation.
    - 3 Tiers of Protection, Components of Tier 2 review, CWA 316 Compliance
  - Must be publicly available.
  - State/tribe must provide an opportunity for public involvement during development and revisions of implementation methods.
- In addition:
  - May provide additional details that explain how the state's/tribe's policy will be implemented.
  - Can be adopted as WQS provisions (binding), incorporated by reference (binding), or written as guidance documents (non-binding).

We just talked about the basic elements that a state's policy must address. What about those implementation methods?

States and tribes must develop implementation methods that describe how the policy will be applied
The methods must be consistent with and address all components of the state's/tribes' policy and EPA's regulation
3 Tiers of Protection, the Components of Tier 2 review, and CWA §316 Compliance for thermal discharges
The methods must be publicly available
The State or tribe must provide an opportunity for public involvement during development and revisions of implementation methods. (Note that doesn't mean necessarily a public hearing, but there should be documentation of what the public involvement was)
In addition:
Methods may provide additional details that explain how the state's/tribes' policy will be implemented
The methods can be adopted as WQS provisions (binding), incorporated by reference (binding), or written as guidance documents (non-binding)

Antidegradation

WQSA December 2016

ADDITIONAL COMPONENTS OF WQS (40 CFR 131.13-131.15)

- States and authorized tribes may adopt additional policies affecting the application and implementation of water quality standards in addition to WQS such as:
  - Mixing zone policies (40 CFR 131.13)
  - Low flow policies (40 CFR 131.13)
  - WQS variance policies (includes WQS variance policies, procedures and authorizing provisions) (40 CFR 131.14)
  - WQS variances, More information on W4S variances can be found at: https://www.epa.gov/wqs-tech/water-quality-standards-variances (40 CFR 131.13)
  - Provisions authorizing use of compliance schedules for WQBELs in NPDES permits (40 CFR 131.15)
- If these additional policies are legally binding provisions, then they are considered new or revised WQS and are subject to EPA review and approval.

INTRODUCTION TO WQS 101

Sections 131.13-131.15 of the WQS regulation allow States to adopt additional policies affecting the application and implementation of WQS such as mixing zone policies, low flow policies ,WQS variance policies, WQS variances themselves, and provisions authorizing the use of compliance schedules for WQBELs in NPDES permits.

These policies are not required elements in state/authorized tribal WQS, but if they are included, they are subject to EPA review and approval as WQS.

Overview

WQSA May 2016

ROLE: STATES, TERRITORIES AND AUTHORIZED TRIBES

- States, territories and authorized tribes have the primary authority to adopt, review and revise WQS and implementation procedures (CWA 303(c)). They must:
  - submit their WQS to EPA for review and approval or disapproval after adoption into their state or tribe's regulations,
  - review their WQS triennially, and
  - conduct a public hearing to involve the public.
- They may adopt standards more stringent than recommended by EPA (CWA 510).
- Tribes may or may not assume responsibility for administering the program at their option. They may apply for "Treatment in a Similar Manner as a State" (TAS) for the purposes of administering EPA programs under CWA 518.

INTRODUCTION TO WQS 5-61

I'm now going to discuss the roles of different entities in water quality standards. First, I'll talk about "states, territories, and authorized tribes." You may have noticed that during the presentation I sometimes shorthand this as "states and tribes" but I mean all 3.

States, territories, and authorized Tribes do the "heavy lifting" in the WQS program: They determine the designated uses, adopt the protective criteria and the uses, adopt antidegradation and implementation procedures. When a State or Tribe adopts new or revised water quality standards, it is required under section 303(c) of the Clean Water Act to submit the standards to EPA for review, and then EPA either approves or disapproves. At least once every 3 years, they must hold public hearings for the purposes of reviewing applicable water quality standards, and modify and/or adopt new and/or revised standards, where appropriate. This is often called the triennial review.

The responsibility for water quality standards is given to the States by statute (CWA section 303(c)) and they have no option but to participate in the program. Indian Tribes, however, may or may not assume responsibility for administering the standards program at their option.

Overview

WQSA May 2016

STATE/TRIBAL WQS SUBMITTALS TO EPA FOR REVIEW UNDER CWA 303(c)

- Must include **the new or revised WQS provisions presented for review**
  - This could be designated uses, criteria, and/or antidegradation provisions/revisions applicable to all waters of the state at once, specific changes to specific water bodies, or provisions/revisions applicable to a specific basin in the state. It is helpful for EPA's review to either identify the specific state or tribal regulatory citations being added. If the WQS are being revised, providing a redline strikeout version can help expedite EPA's review.
- Must include **supporting information** regarding those provisions
  - For example, if a state or authorized tribe is revising a use specified in CWA 101(a)(2) to require less stringent criteria, the state or authorized tribe would need to submit a UAA.
- Must include **certification that the standards were duly adopted according to state or tribal law**
  - This certification must be provided either by the State Attorney General or appropriate legal authority within the state or authorized tribe. This is often called "Attorney General Certification" or "AG Cert".
- Must include evidence of a **public hearing**
  - EPA's regulation at 40 CFR 131.20(b) requires that states and authorized tribes must, at a minimum, conduct a public hearing on all new and revised water quality standards consistent with 40 CFR 25.5, regardless of whether the revisions are connected to a triennial review or not.

After being adopted into a state or tribe's regulations, a State or authorized Tribe will submit its standards to EPA for review under CWA 303(c).

A state or tribe's submittal must include:

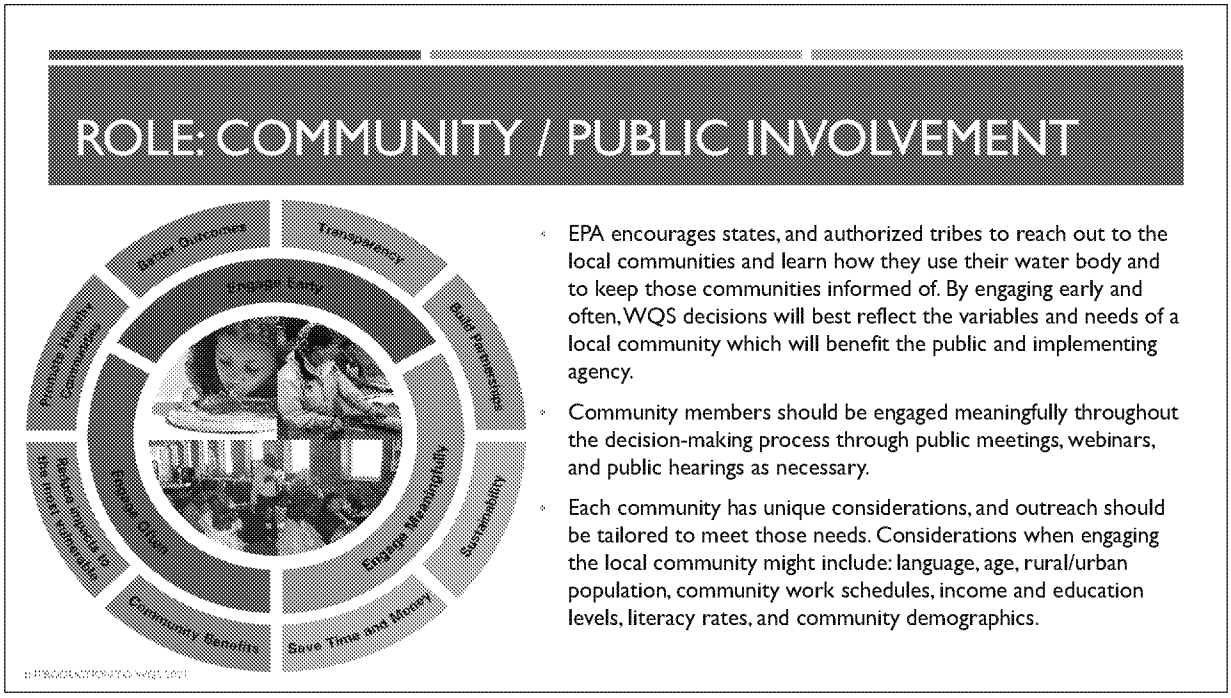
the new or revised WQS provisions presented for review – could be uses, criteria, and antidegradation for all waters of the state all at once, or just a few specific changes, or WQS for a specific basin in the state. Whatever it is, it should be clear what the new or revised WQS are – so you'd want to show state regulation numbers to reference, and if it's a revision, a redline strikeout version can help with comparison.

supporting information regarding those provisions – for example, if a designated use is being revised to something less than 101a2 use, you would need to submit a UAA. The UAA itself isn't something that the EPA would 'act on' to approve or disapprove, but the EPA would evaluate the UAA as it shows the basis for the use change that EPA does need to act on.

certification that the standards were duly adopted according to state or tribal law (often called "Attorney General Certification" or "AG Cert"

evidence of public hearing. EPA's regulation at 40 CFR 131.20(b), as revised in 2015, makes clear that states and authorized tribes must conduct a public hearing on all new and revised WQS consistent with 40 CFR 25.5, regardless of whether the revisions are connected to a triennial review or not.

Overview



Any revision or review of a WQS must be subject to a public hearing. But, it's not limited to that.

EPA encourages states, territories and authorized tribes to reach out to the local communities and learn how they use their water body and to keep those communities informed of any WQS issues that could impact that water body. By engaging early and often, WQS decisions will best reflect the variables and needs of a local community which will benefit the public and implementing agency alike (see outermost circle of figure).

Community members should be engaged meaningfully throughout the decision-making process through public meetings, webinars, and public hearings as necessary. Keep in mind that each community has unique considerations, and outreach should be tailored to meet those needs. Considerations to keep in mind when engaging the local community might include language, age, rural population vs. urban population, community work schedules (for purposes of planning public hearings, for example), income and education levels, illiteracy rates, and similar demographics.

WQSA May 2016

Overview

ROLE: EPA

- Facilitate development of regulations and policies that guide EPA's review of submitted WQS.
- Coordinate with and provide technical assistance to states and authorized tribes.
- Develop and publish CWA 304(a) criteria recommendations (based on latest science).
- Approve/disapprove WQS submitted by states and authorized tribes. CWA requires EPA to approve within 60 or disapprove within 90 days. (CWA 303(c)).
  - If EPA approves as consistent with the CWA and WQS regulation, the new/revised WQS becomes effective for CWA purposes.
  - If EPA disapproves, the state or tribe has the chance to revise. Consistent with the CWA, if the state or tribe does not adopt specified changes within 90 days, the EPA Administrator must promptly propose and promulgate replacement WQS.

7-14-09

WQSA Module 2: Overview

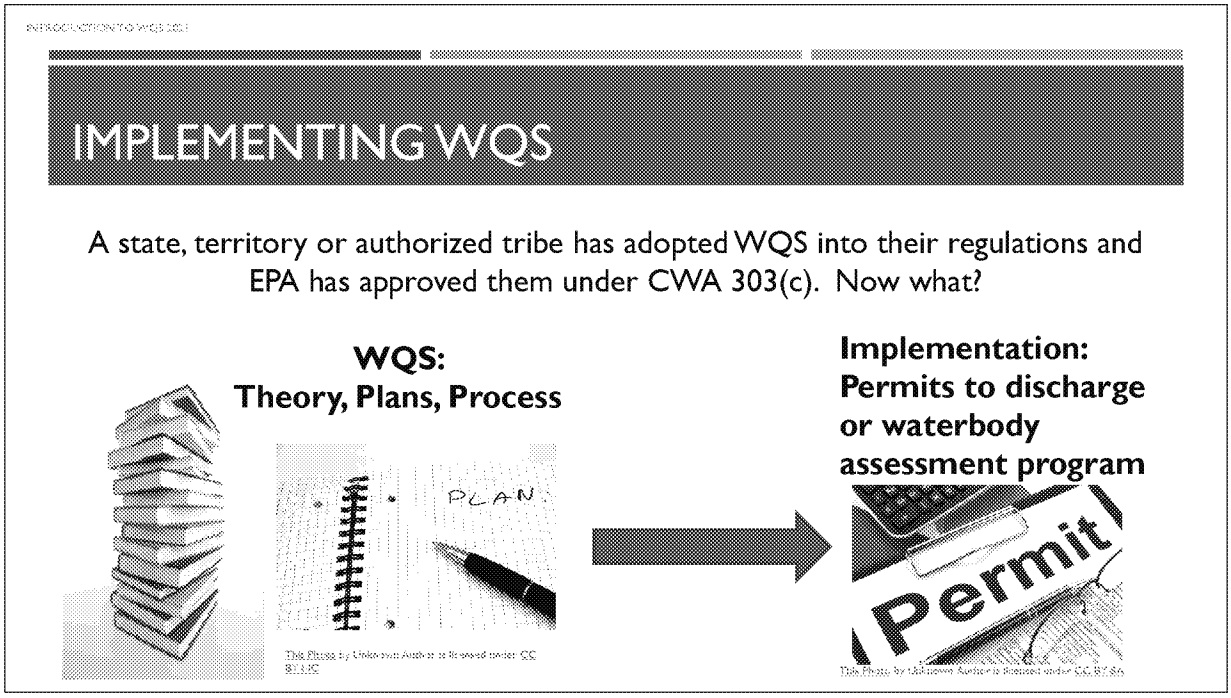
EPA serves several roles for water quality standards.

For one, it facilitates development of regulations and policies that guide EPA's review of submitted WQS
EPA also coordinates with and provide technical assistance to States and authorized Tribes
EPA develops and publishes national CWA 304(a) criteria recommendations (based on latest science)

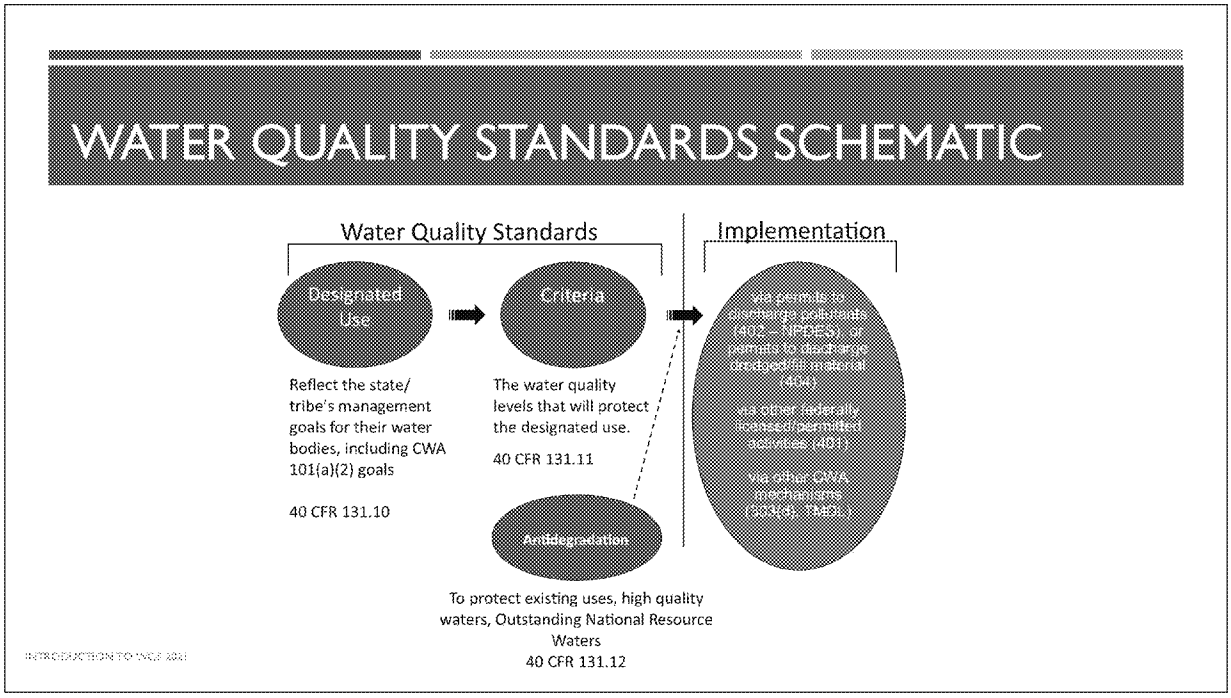
The EPA Administrator has delegated the authority to approve or disapprove state and tribal WQS under CWA 303(c) to the EPA Regional Administrator. The Act sets out a statutory timeframe for action: 60 days to approve or 90 days to disapprove. WQS do not become legally binding, or useable, for CWA purposes until EPA approves them. Once EPA approves, they become effective for CWA purposes.

EPA's basis for review and approval or disapproval is whether the submitted WQS are consistent with the CWA and/or federal WQS regulation. Note that while EPA reviews State/Tribal standards to ensure that they meet the minimum requirements and the intent of the Clean Water Act, EPA does not have the authority to disapprove a State's/Tribe's standards on the grounds that the standards are too stringent. Section 510 recognizes a State's authority to adopt standards that are more stringent than those required by the Act.

If EPA disapproves, EPA provides an opportunity for the states/tribes to revise their WQS. As specified in the CWA, If state or tribe does not adopt specified changes within 90 days, the EPA Administrator must promptly propose and promulgate replacement WQS.



One way to think about the difference between WQS and Implementation is that WQS are the theoretical basis for lots of implementation programs. Think of WQS as the theory, plans, process. Then implemented through permits to discharge (as the slide shows), or other programs like assessment and 303(d) listing of impaired waters. Implementation is where the rubber meets the road for water quality protection.



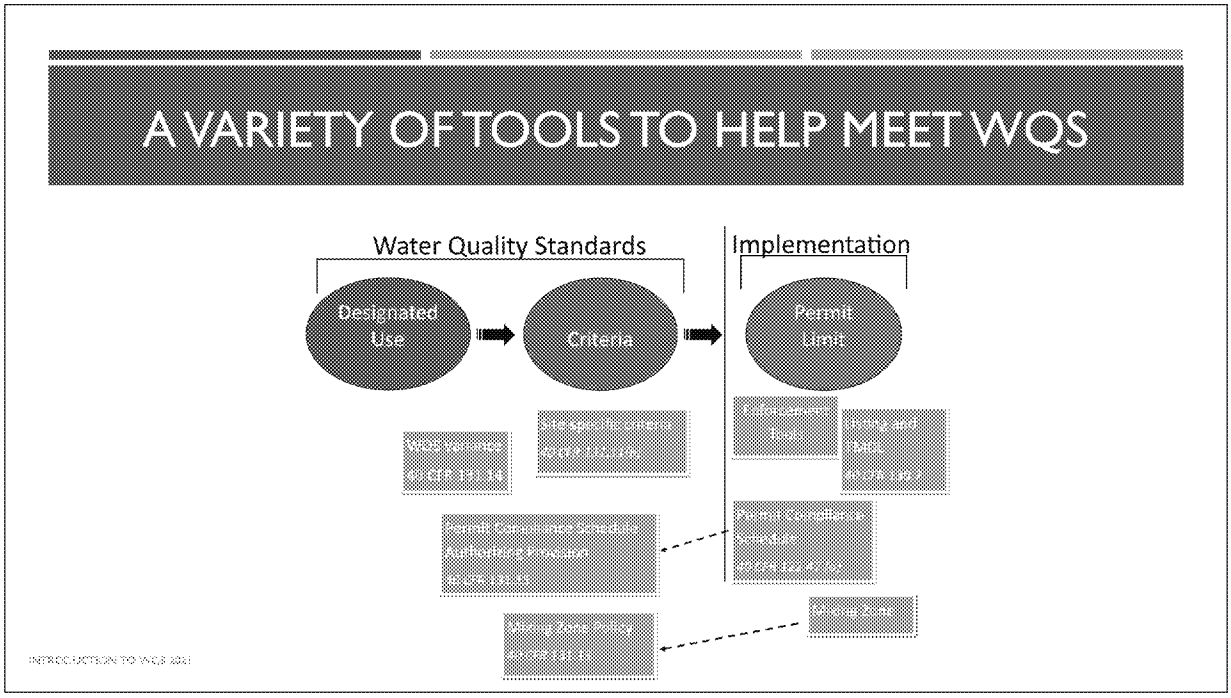
What that boils down to is, you set up your state or tribal WQS in order to provide the basis for your other CWA programs to work off of. Permits to discharge pollutants (via NPDES) or to discharge dredged or fill material (via section 404 permits) need to be structured in order to help attain WQS. And, when you assess whether a water is impaired or not attaining its WQS, you will assess the water based on your WQs. If you end up developing a TMDL as a means to help restore water quality, you will use the WQS to set the target of the TMDL.

Hopefully you have a sense now of why WQS are important as a base for all the other implementation programs.

Before we end I will mention a few "tools" that you may be familiar with or may be hearing about in your future, tools that can help to achieve WQS. We know that many waters are impaired or aren't attaining their WQS in the short term, but under the CWA framework, we need to work towards achieving the WQS, adjusting where needed and restoring where needed.

Overview

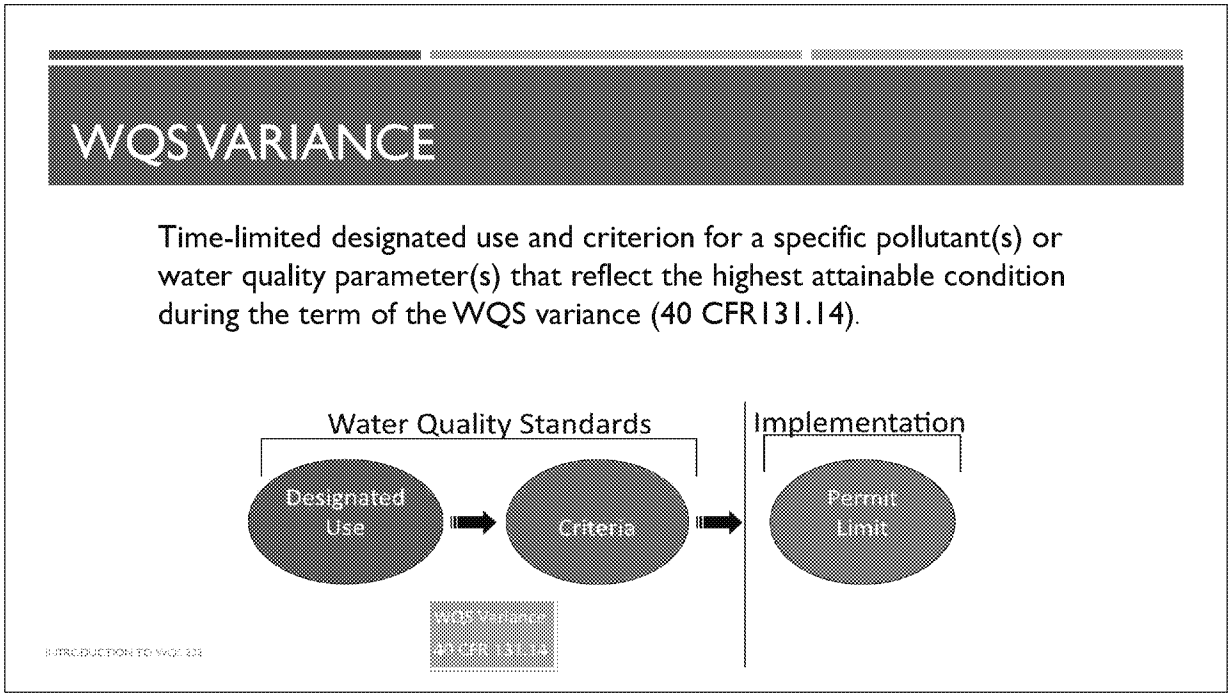
WQSA May 2016



Here are a variety of tools that you may encounter, some relating to the WQS themselves, and some relating to implementation programs (simplified in this diagram as 'permit limit')

In the realm of water quality standards, shown at left, we have variances and site-specific criteria, I'm going to tell you a little about these now.

WQSA December 2018



A WQS variance is a time-limited designated use and criterion for a specific pollutant(s) or water quality parameter(s) that reflects the highest attainable condition during the term of the WQS variance. Unlike use revisions, WQS variances do not change the underlying designated use, and they only apply for the dischargers, waterbodies, and pollutant or water quality parameter identified within the WQS variance and only for the length of time specified in the WQS variance.

WQS variances are a useful tool for when there is uncertainty around whether the standards can be attained, but you know you could make incremental improvements. They allow time to implement actions, assess the impact of those actions, and then adapt those actions in order to effectively improve water quality.

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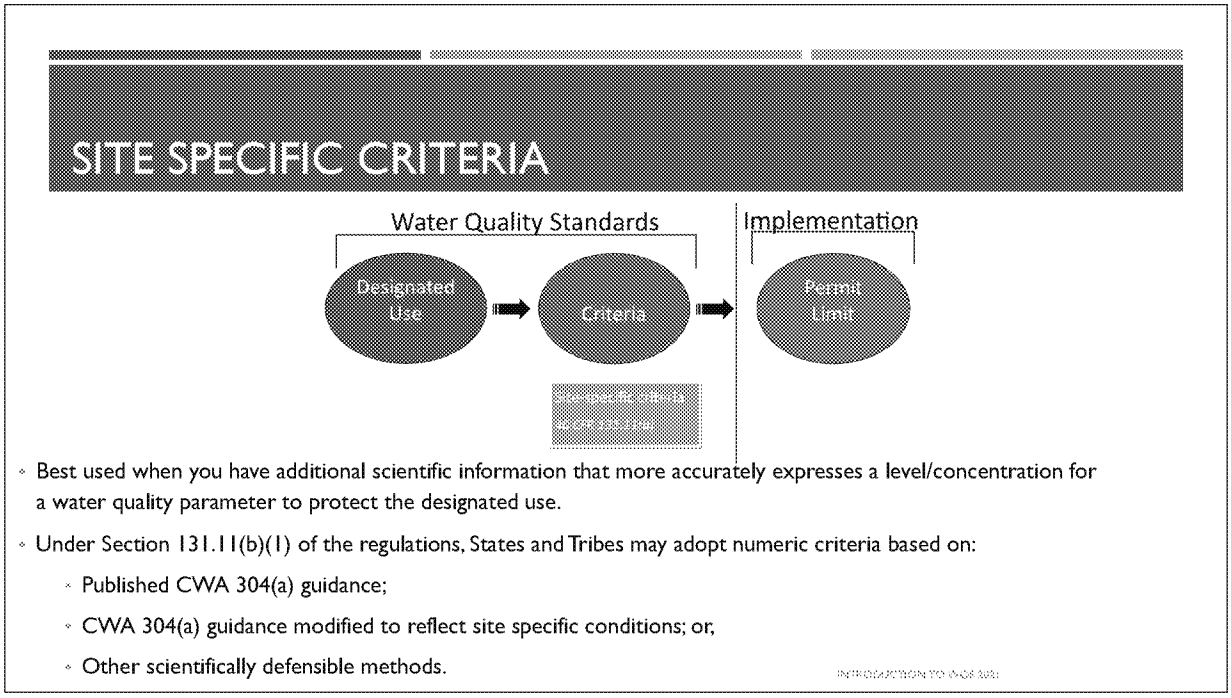


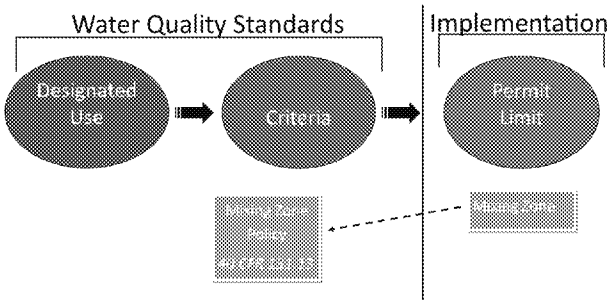
Site specific criteria are another tool for meeting WQS. If you are having trouble meeting the WQS in a water body, it is possible that you might not have the right criteria to protect the use. Site specific criteria are best used when you have additional scientific information that can more accurately express a level for a water quality parameter to protect the designated use based on the water body's specific physical, chemical, and biological characteristics.
Under Section 131.11(b)(1) of the regulations, States and Tribes may adopt numeric criteria based on:
Published CWA Section 304(a) guidance;
Section 304(a) guidance modified to reflect site specific conditions; or,
Other scientifically defensible methods

WQSA December 2018

MIXING ZONE

A tool that allows for dilution of a discharge before criteria must be met.

- A **mixing zone** is a limited area or volume of water where initial dilution of a discharge takes place and where certain numeric water quality criteria may be exceeded.
- **Rationale:** Sometimes organisms can be exposed to pollutant concentrations above a criterion magnitude for a short duration without interfering with the designated use of a waterbody as a whole.



Now I'll mention some tools for achieving standards that "live" in the realm of implementation programs.

An NPDES permit may in some circumstances include a "mixing zone," which is a provision allowing an initial zone of dilution around the outfall in which criteria can be exceeded, but the WQS of the water body as a whole will be met. The rationale for allowing this in some permits is that sometimes organisms can be exposed to pollutant concentrations above a criterion magnitude for a short duration without interfering with the designated use of the waterbody as a whole.

The "mixing zone" provision itself is contained in the actual NPDES permit, as you see on the right in the diagram, but the state or tribe's WQS would contain a policy about mixing zones, as you see on the left. That policy would outline details such as descriptions of circumstances under which mixing zones would or would not be allowed.

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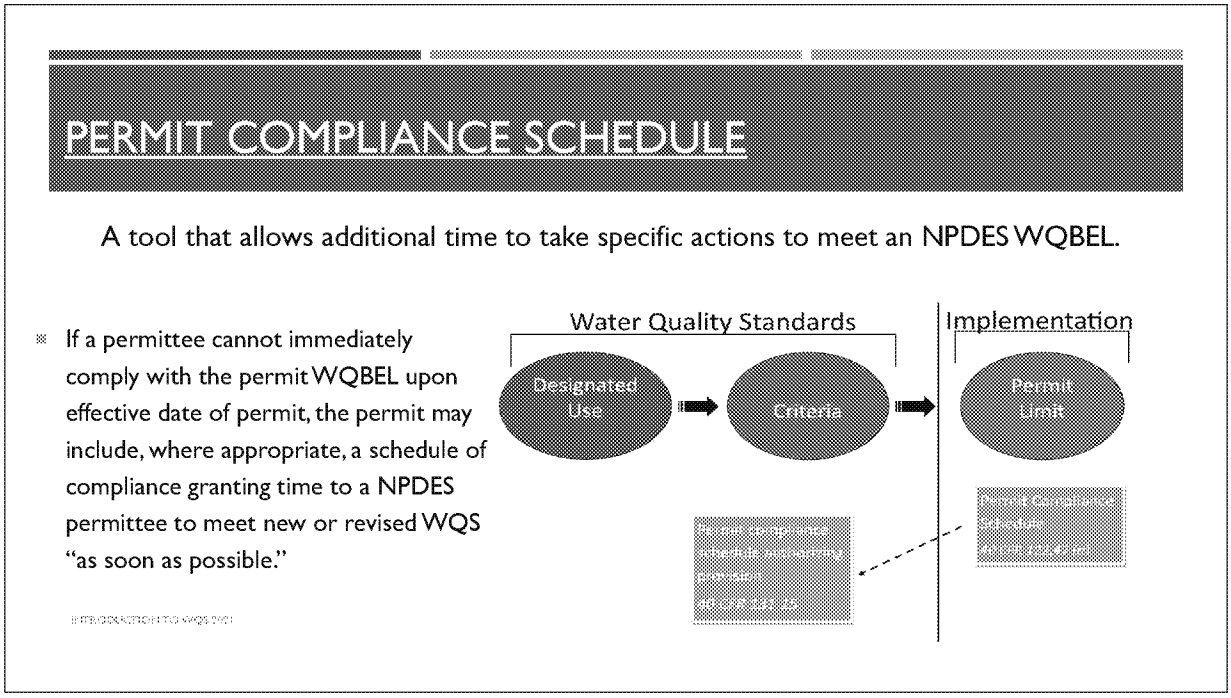

Another tool that "lives" in NPDES permits is NPDES permit compliance schedules.

If a state or tribe has authorized the use of NPDES permit compliance schedules in its WQS via an authorizing provision (see this indicated on the left in the diagram), NPDES permits discharging to waters in the state or tribe may include permit compliance schedules as needed. This would be when a permittee cannot immediately comply with the permit's water quality-based effluent limits upon the effective date of the permit. If that is the case, where appropriate, the permit can include a schedule of compliance that grants time to the permittee to take additional actions needed to meet the limits (such as adding treatment or expansion). The regulation requires that the water quality effluent limits be met "as soon as possible."

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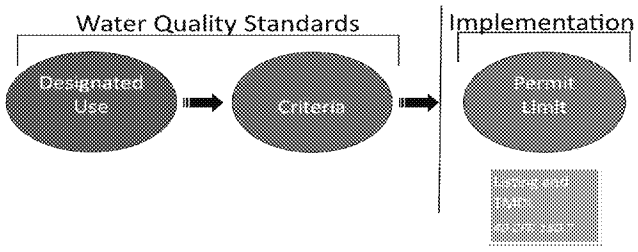
TOTAL MAXIMUM DAILY LOAD (TMDL)

A tool to calculate needed source reductions (point sources and nonpoint sources) to meet WQS.

- A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources (waste load allocations for point sources and load allocations for nonpoint sources).
  - Every 2 years states/tribes develop a list of waters that are not meeting applicable WQS and need a TMDL.



A Total Maximum Daily Load (TMDL) is another tool to help achieve WQS.

States are required to assess the quality of their waters every two years, and part of this assessment includes making a list of waters that are not meeting their water quality standards. This is called the "CWA 303(d) list." Waters that get put on this list are in queue to have a Total Maximum Daily Load, which is a plan for how to get the water to meet its WQS.

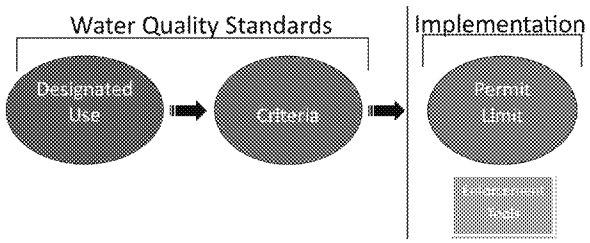
A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources (waste load allocations for point sources and load allocations for nonpoint sources). A TMDL would be developed for a water not meeting its standards, with the goal being that once actions are taken to reduce the relevant loads, the water would then meet its WQS.

WQSA December 2018

ENFORCEMENT TOOLS

Requirements outside of WQS to take specific actions.

- Enforcement tools support implementation of NPDES permit limits and the underlying WQS.
  - For example, administrative orders and civil judicial consent decrees contain enforceable corrective actions and deadlines to return to compliance.



Enforcement actions are established outside the permitting and WQS development framework to resolve violations and support implementation of permits. Enforcement actions are intended to return a facility to compliance with the permit limit, and consequently, the underlying WQS.

WQSA December 2018

As you can see by now, WQS provide the basis for many other CWA programs, and we can think of this as the ""Water Quality Based Approach."

The activities described in this slide (the pie slices) are a sampling of the implementation tools that rely on Water Quality Standards (WQS) to define the water quality goal that needs to be achieved. WQS is the base or "target" for the implementation programs, which is why it is at the center of the wheel.

The water quality-based approach emphasizes the overall quality of water within a water body and provides a mechanism through which the amount of pollution entering a water body is controlled based on the intrinsic conditions of that body and the standards set to protect it.

The Water Quality Based approach is a cyclic process which starts at the center with establishing water quality standards and then either goes to "conduct monitoring and assessment" or "write permits." For example, if you start with "write permits" at the 7pm wedge, which are written to comply with the underlying WQS, then the state or authorized tribe will monitor the effluent to see if it is meeting its permit limits and monitor the ambient water to track the water body's health. Based on how these assessments compare to the water quality standards (the water quality goal of the water body), a waterbody may be listed as impaired. If a water is listed as impaired, it is then slated to receive a Total Maximum Daily Load (or TMDL). That TMDL is implemented through integration into permits, and the cycle begins over again.

Beyond public involvement in the development of water quality standards, the implementation of water quality standards also provides opportunities for meaningful community engagement at the state, tribal and local levels. The arrows on the outside of the "pie slices" in the diagram refer to this. For instance, the community surrounding a water body can monitor the water quality and provide data and information to their state, they can review and comment on draft permits and TMDLs as well as the Section 303(d) impaired water listings.

I hope that you now have a good sense for what WQS are, how they are implemented, and the roles of various entities in WQS.

WQSA May 2016

Overview

THANK YOU!

- Questions?