TRANSCRIPT

Water Quality Standards Virtual Academy
Water Quality Standards 101

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Janita Aguirre
Welcome to today's presentation titled **"Water Quality Standards 101."** This presentation is sponsored by the Office of Water of the United States Environmental Protection Agency, also known as the EPA.

I am Janita Aguirre with the EPA's Office of Water, Headquarters Office in Washington, DC. Thank you *all* for joining us today. Before we get started, we are going to go through some logistics.

The easiest way to participate in today's web presentation is through the audio broadcast. If you have computer speakers or headphones, then select "Yes" when prompted to "Join This Integrated Voice Conference." Volume Control Settings will then appear. Make sure that your speaker volume is turned on. Then, click "OK." If you do not have speakers or headphones, you can also connect by phone. If you are connecting by phone, please dial 650-479-3208. Once prompted, enter in the code 668 640 610 and then hit the pound key.

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Because of the high number of participants here with us today, we will not be able to answer all questions posted during this presentation. We will, however, stop at various points in the presentation and answer common questions or questions that were submitted during the registration process. Also, if we are getting a lot of people asking the same or similar question, we will try our best to answer those. In addition, the questions you send us during the presentation will help us to enhance future web presentations.

Throughout the presentation, we will be taking time for short polls. These polls will pop up on the right hand side of your screen. You will be able to select your answer by clicking on the answer choices. We will demonstrate this a little later.

The objectives of this presentation are to provide a basic introduction to the water quality standards Program, and describe how different audiences, such as states, tribes, and non-governmental organizations, can use water quality standards to protect human health and water quality. If you have a specific question about a local water issue, please contact your state, tribe, or the EPA Regional Office.

In this presentation, we will provide introductory information that is relevant to those who want a broad overview of water quality standards. The materials presented in this presentation will also provide a refresher for people already familiar with water quality standards.

As we move through today's presentation, we will describe more specifically how water quality standards can be used by states, authorized tribes, and other stakeholders to protect people and their water quality. Throughout the discussion, there will be specific examples of how water quality standards are being used. We will also work on brief activities where you will have the ability to apply what you have learned.

This presentation is meant to be informational only, this presentation does not impose any binding requirements; determine the obligations of the regulated community; change or substitute for any statutory provision or regulation; represent, change, or substitute for any Agency policy or guidance; and lastly, it does not control in any case of conflict between this discussion and statute, regulation, policy or guidance.

As we begin, let me introduce today's presenters. I am Janita Aguirre. I am an Environmental Scientist with the EPA's Office of Water. Since joining the EPA in 2005, I have worked in the water quality standards program on issues related to water quality standards, criteria implementation, and the Endangered Species Act. I am currently the Tribal Water Quality Standards Liaison for my office.

Our next speaker is Tom Gardner. Tom has been with the EPA Office of Water since 1997, where he has served as an instructor in the Water Quality Standards Academy and as Regional Contact Liaison for the EPA Region 7 Office and Region 9 Office. He has also covered Biocriteria and Variance issues for the National Water Quality Standards Program.

Heather Goss will also be presenting today. Heather is a Physical Scientist in the EPA's Office of Water in Washington D.C. Since joining the water quality standards program in 2008, she has worked on a variety of standards issues and has special expertise in antidegradation, designated uses, and the relationship between standards and permits. She regularly facilitates the "live" WQS Academy.

During today's presentation, we will discuss key features of water quality standards including: why water quality standards matter, what laws and policies govern the water quality standards program, where and how water quality standards apply, and the major components of water

quality standards: designated uses, water quality criteria, and antidegradation. In addition, the presentation will focus on how water quality standards are implemented through the water quality based approach, including permits, monitoring and assessment and total maximum daily loads.

Finally, we will discuss how you, no matter what your role, can influence the water quality standards that protect you and your water quality. Throughout the presentation we will take time for brief activities intended to apply your knowledge.

First, let's take a step back and talk about why water quality standards are important. 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 objective. Things like "integrity" are a little hard to define, and even harder to measure. Fortunately, just a little farther down the page, the CWA Section 101 (a) (2) 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." Water quality standards help define what the CWA means by "protection and propagation of fish, shellfish, and wildlife." Standards also help define what the CWA means by "recreation in and on the water" and help define what the CWA means by "where attainable." 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 "hook" for many water quality management actions in the CWA. 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 CWA.

Some of you are probably 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" and in which a person "does not drown but decays."

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 and the water quality standards program, which are intended to help prevent the impairment of our waters.

This is the Cuyahoga today. What happened between the days when the river was burning and oozing and now? Well, several things - the CWA and water quality standards regulations 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 water quality standards, a water quality management program can still have an effect in today's waters. 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.

Before we go much further into the presentation, we have three quick poll questions for you, to answer. You should see the first poll question on your screen, which reads, "Who is participating today?" We have introduced ourselves to you, now we want to get an idea of who is participating today. Please select your professional affiliation from the list below the question. Please click on the choice that best describes who you work for. Getting a sense of who is in the audience will be helpful for our speakers and for future web presentations. You can select your choice by clicking the hollow circle to the left of each answer. While we are waiting for the poll results, let me point out some of the resources that are available to you during and after this presentation. You have all been emailed several documents. These include: An acronym sheet; a glossary; a list of the EPA Regional water quality standards coordinators; a list of helpful websites; and a copy of the water quality standards regulations. If you do not know which EPA Region you are in, you will find out toward the end of this presentation. You can also look to the list of helpful websites and follow the link for the "EPA Regional Offices" where you will be directed to a map to find which Region you are in. You may also access these materials by visiting the EPA water quality standards Academy website at water.epa.gov/learn/training/standardsacademy/. Once you are on the website, scroll down the page to Webcasts. Under that you will see the list of handouts.

And here are the results from the first poll question. You should see them now. It is great to have you all here today. It looks like we have a really good mix of participants.

And now you can see poll question number two, "How many people are participating at your location?" Please select the best answer from the list below the question. Please click on the choice that best describes how many people are watching the presentation from your location. If you are watching by yourself, please select "just me." And while we're waiting for those poll results, I'd like to announce the date and location of the next live Water Quality Standards Classroom Academy. The Classroom Academy is a five-day course tailored for those with six months to one year of experience with water quality standards. We go into much more detail on the topics discussed today. There are also interactive group activities that engage students in applying their knowledge to example scenarios. It can be a fun way to network and learn more about water quality standards. The next Classroom Academy will be held in Washington, DC December 10th to the 14th. We will be providing more information on how to register at the end of today's presentation. This course is offered approximately two times each year here in Washington, DC. It is free to attend; although travel and other related expenses are not included. Because of the high demand for the course, and the limited space available, not everyone who

applies will be admitted; however those that are not admitted the first time are put on a waiting list, and are given first notice and higher priority for subsequent academies.

And now we have the answers to the second poll question. As you can see, it looks like most people are viewing the presentation by themselves, but we do have some groups watching the presentation together.

And now you can see poll question number three, "Why are you here?" Please select the answer that best describes why you are here.

I hope you are all getting used to how these polls work, because we will be having brief activities throughout the presentation using this system.

While we are waiting for the results, I wanted to thank those of you who described your expectations for the presentation and/or provided specific questions when registering for this web presentation online. We had over 1,000 registrants for this web presentation. We have tried to tailor the web presentation to address your expectations and answer your questions to the best of our ability within this two hour introductory course.

For the polls you are taking now, we have provided about two minutes for you to select your answers. For the remainder of the polls we will be providing about five minutes each. While people are submitting their answers, we will be taking time to answer questions that are commonly asked or that were submitted during the registration process.

For those of you who are here because your management suggested or required it, we want to thank your management for that, and we hope that we make it worth your time. And now, I will pass it off to Tom Gardner who will take you through laws, regulations and guidance related to water quality standards.

Tom Gardner

Thanks Janita and thanks for being here today for our discussion of water quality standards. Now, I know that when a lot of people think about water quality standards, their first thought is "Hey, Science." I know I did, I'm a scientist. There is a lot of science that goes into developing standards, and we will talk about that, but there is also a pretty important legal component.

In this section, we are going to talk about how water quality standards are creatures of the CWA, and about how they are implemented through the Federal water quality standards regulations, and state and Tribal laws. We will also talk about the guidance EPA issues to help states and authorized tribes use their standards to protect their waters. We will talk about how these three things: laws, regulations, and guidance, are different, and how they work together. So grab your books and let's head to law school.

I think most folks are pretty familiar with the concept of a law. I am old enough to have had a class in high school called "civics," and we talked about how a bill becomes law, how any member of Congress can introduce a piece of legislation, and how the House puts it in something called the "hopper." The Senate then gives it to the presiding officer, and it gets a number and a

name. It gets referred to a committee, and then there might be some hearings, mark ups, and then it gets put on a calendar, sent to the floor, voted on, sent to the other chamber, and signed by the president. Then, it finally becomes a law and is published in something called the United States Code.

And that's the end, right? No, it's not. A lot of legislation, including the CWA, empowers federal agencies to "prescribe such regulations as are necessary to carry out" the Act. Sec 501 of the CWA does this. So the CWA "tasks" the EPA with developing regulations to implement the CWA, and these regulations are just like laws. Our attorneys say they "have the force and effect of law." We non-lawyers often refer to them as "the musts." For example, the national water quality standards regulations are the basis for the EPA's approval or disapproval of a state's or authorized tribe's adopted water quality standards.

Regulations can help resolve inconsistencies in the law or fill in any gaps. Laws often have imprecise language. That's one way Congress can reach a compromise. Real clarification happens in the regulations.

How are regulations developed and promulgated? I'm going to wildly over simplify the process here. The process itself is governed by the Administrative Procedure Act of 1946. First, an authorized agency like the EPA determines whether or not a regulation may be needed. The agency researches it and, if necessary, proposes a regulation. The proposal is listed in the Federal Register so that members of the public can consider it and send their comments to the agency. The agency takes comments on the proposed regulations, determines if any changes are needed, makes the changes and responds to the comments. The regulation is then published in the Code of Federal Regulations. The EPA's regulations for water quality standards are found in Volume 40, Part 131 of the Code of Federal Regulations, or 40CFR131.

Now, the EPA's guidance and policy are different. They are the EPA's recommendations on how to implement the Act passed by Congress and regulations written by the federal government. 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. We can't use guidance as "proxy rulemaking." To summarize, laws are the overarching framework of requirements, regulations are more specific requirements that "flesh out" the laws, and guidance and policy are suggestions to help facilitate the implementation of laws and regulations.

Now, let's take a quick peek at the CWA. In 1972, with the objective of protecting surface waters, like rivers, lakes, and streams, the U.S. Congress passed the CWA, the official name is the Federal Water Pollution Control Act. The CWA is the cornerstone of surface water quality protection in the United States. The statute employs a variety of both regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. You can learn a lot about the CWA just by reading the first page.

The overall objective of the CWA is to quote Section 101(a), "restore and maintain the chemical, physical and biological integrity of the nation's waters." The CWA also establishes an interim goal, "water quality which provides for the protection and propagation of fish, shellfish and

wildlife and provides for recreation in and on the water," wherever attainable. This is sometimes referred to as the "fishable/swimmable where attainable" goal of the Act, but let me give you an insider tip. Standards pros like to use the full name. You will hear these phrases again several times during our presentation. The importance of this interim goal will be discussed when we talk about water quality standards.

The CWA protects United States' surface waters, but note that groundwater is not included. Groundwater is protected by other laws like the Safe Drinking Water Act. States and authorized tribes, which are those approved by the EPA to conduct specific programs, implement CWA programs. We'll talk more about this later, but I want to point out that as we go through the presentation we will talk about states and authorized tribes. For the purposes of the water quality standards program, territories are treated similarly to states. Tribes have a unique government-to-government relationship with EPA and for administering environmental programs, such as a CWA water quality standards program. Federally recognized tribes can apply for TAS or treatment in a manner similar to a state to administer a CWA water quality standards program on their reservations. More details will be provided later in the presentation about the unique roles of states and unique roles of authorized tribes in the water quality standards program.

Some relevant provisions of the CWA are listed here. I have highlighted several that are important to our discussion today. 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. We talked about Section 101 in the last slide, so you are all now experts. Can you remember what the "interim goal" is? Sure, you can, it is the protection and propagation of fish shellfish and wildlife, recreation in and on the water goal.

Note, Section 303 is the key section in the standards world. This is the section we will focus on today. It tells the states and authorized tribes to establish water quality standards and water quality management plans. The EPA's job is to "review…any new and revised" state and tribal adopted standards to make sure they meet the requirements of the Act and the water quality standards regulations. We will talk some more about this later in the presentation.

Section 319 tasks states and authorized tribes with developing plans to manage non-point source pollution (that's the pollution that does not come from out of a discharge pipe), and tasks the EPA with awarding grants to states and authorized tribes to implement the plans. This is how the CWA addresses non-point source pollution. The CWA provides no direct regulatory authority over non-point sources of pollution.

The National Pollution Discharge Elimination System, or NPDES, permitting program was established under Section 402. NPDES regulates the pollution that does come from a pipe. We will talk about NPDES later in the presentation.

The state or tribal water quality standards are the foundation of any state and Tribal water quality management program. They serve a variety of functions. Water quality standards serve as the basis for water quality-based control actions like establishing limits in discharge permits to point sources. Examples of decisions based on water quality standards include: reporting on the conditions or status of state or Tribal water quality; developing what are called "water quality

based effluent limits" for point sources; and setting targets for calculating Total Maximum Daily Loads, or TMDLs. All of these will be discussed later in the presentation.

If you are looking for water quality standards, look to your state's or authorized tribe's standards. Section 303 of the CWA and the EPA's water quality standards regulation at 40CFR131 lays out the minimum requirement for state and tribal standards. A water quality standard contains three basic elements: designated uses of each waterbody or portion of a waterbody; water quality criteria to protect designated uses; and an antidegradation policy and implementation procedures to maintain and protect existing uses, and higher quality waters. We will go into more details later on in the presentation.

Before we get into details about what water quality standards actually are, and how they support the goals of the CWA, we'll talk about where and how water quality standards apply. So, what waters are we talking about? And what impacts on waters are we talking about?

Water quality standards must be adopted and must apply to all Waters of the U.S. The current interpretation of the definition of Waters of the U.S. is here on the slide. This definition encompasses a broad range of waters, including rivers, streams, seasonally flowing streams, lakes, natural ponds, wetlands, and marine waters. Marine waters include estuaries, such as bays, salt marshes, and lagoons and near-shore coastal waters within three miles.

The definition of Waters of the U.S. does not include groundwater. Some states and Authorized tribes may have water quality standards for groundwater, but such standards do not fall within the scope of the federally mandated water quality standards program and therefore the EPA would not review, approve, or disapprove these under the CWA.

Waterbodies may be segmented such that, where appropriate, different standards may apply to different segments of the same waterbody. For example, a river may be divided into segments, and different water quality standards could apply to each segment. Please see the website list for a link to more information on Waters of the U.S.

water quality standards pros know that the courts, up to and including the United States Supreme Court, have been very active in this area, so I would definitely visit that link if you think you may be involved in this area.

We've stated that one of the things water quality standards directly affect is point source discharges. The CWA 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."

It is important to note, though, that the term specifically does not include agricultural stormwater discharges and return flows from irrigated agriculture. Some examples of activities that have point source discharges that 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

CWA. Remember, point source dischargers 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 (CAFOs); permits for operations that may result in discharge of dredged or fill material to Waters of the U.S. This type of discharge, and the permitting process for it, are discussed in Section 404 of the CWA; and permits or licenses for Federal facilities that may result in discharge to Waters of the U.S. This type of discharge and the permitting process for it are discussed in Section 401 of the CWA.

We talked about how a state's or tribe's water quality standards directly affect point source pollution in Waters of the U.S., but what about other types of pollution? Remember, non-point source, or NPS, pollution is any source of water pollution that does not meet the legal definition of "point source" in CWA 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.

I mentioned earlier that the Act does not regulate non-point sources of pollution. But to address non-point sources, the 1987 amendments to the CWA established the Section 319 Non-Point Source Management Program. Under Section 319, states and tribes authorized for the Section 319 Program are eligible for grant money that supports a wide variety of activities including technical assistance, financial assistance, education, training, demonstration projects and monitoring to assess the success of specific non-point source implementation projects.

When I go out, I get lost pretty easily. So I like to have a map or these days, my smart-phone. So we put together a little "standards map" to help us see where we are in the process at any point in time. The map shows the three required components of water quality standards.

The first component of water quality standards is to set your designated uses. This is the goal of what you want to protect, such as "swimming," or "aquatic life" or "public water supply." Once you know what you want to protect, you can pick the criteria, or the maximum amount of a pollutant that can be in the water and still support the use. Criteria are the second component of water quality standards. The third aspect is antidegradation, which provides specific protections for existing uses, high quality waters, and what are called outstanding national resource waters, or ONRWs. On the right side of the vertical line we have Implementation of these standards, through real world programs.

A permit limit is a limitation on the pollutants from a point source that can be discharged into a waterbody. It is set by the entity authorized to issue NPDES permits in the state or tribe. Most states issue their NPDES permits. The EPA issues permits for a few states and for authorized tribes. Permit limits must "derive from and comply with water quality standards" so they have limits on the amount of pollutants that can be discharged to the water based on the criteria.

But, before we start, Janita is going to take us through our first activity. Take it away, Janita.

Janita Aguirre
Thanks Tom. You should see a map of State of the Art, USA on your screen now. State of the Art is a hypothetical small state, which we will use for each of the activities throughout this web presentation. I am going to tell you a little bit about State of the Art now. But don't worry about remembering all the details. You will have the information you need to complete each activity. State of the Art is located in the Arrowhead Lake Watershed. This watershed is composed of five major rivers and streams with various tributaries. There are several other waterbody types throughout the state. There are varied entities, such as industries and farms, that contribute pollutants to the local waterbodies.

The northern and eastern sections are dominated by forests, wetlands, and streams. The western portion of the state has recently started to experience development pressure from the Newport City metropolitan area. The northern portion of the state, and especially Bass Lake, are popular with city dwellers seeking outdoor recreation. The southern portion of the state is primarily composed of agricultural land. There are a few small communities in the area, which are growing as the City of Newport grows.

You should now see a poll question in the bottom right-hand side of your screen. Based on our discussion of where water quality standards apply, would Arrowhead Lake be considered a Water of the U.S. where water quality standards apply? Please click on the choice that best describes your answer. Remember, you are not being graded on your answer so please provide what you feel is the best answer.

While we are waiting for you to submit your answers, we will take time to answer one question related to laws, regulations, and guidance. One question we often get is: How do you regulate non-point sources? Tom, how would you answer this question?

Tom Gardner
Thanks, Janita. The CWA provides no direct regulatory authority over non-point sources of pollution. To address non-point sources, the 1987 amendments to the CWA established the Section 319 Non-Point Source Management Program. Under Section 319, states and authorized tribes receive grant money that supports a wide variety of activities to help control non point sources including things like technical assistance, financial assistance, education, training, demonstration projects and monitoring to assess the success of specific non-point source implementation projects. In addition, states and tribes may develop their own laws or regulations that address non point sources, but information on them would have to come from the state or tribe.

Janita Aguirre
Thanks, Tom. And here are the results of our poll. Again, the question was: Would Arrowhead Lake be considered a Water of the U.S.?

The correct answer is (a) "yes." Arrowhead Lake is a Water of the U.S. If you remember, the definition of Waters of the U.S. encompasses a broad range of waters. One thing that helps

identify Arrowhead Lake as a Water of the U.S. is that we describe it as navigable by commercial watercraft. This supports it being defined as a traditional navigable waterway, and therefore a Water of the U.S. OK, and now I am going to pass it back to Tom.

Tom Gardner
Thanks, Janita. The first component of standards that we're going to discuss today is designated uses.

Going back to our conceptual diagram, water quality standards really start with designated uses, which express the state or tribe's goals for its waters. Designated uses are a state, or authorized tribe's concise statements of its management objectives and expectations for each of the individual surface waters under its jurisdiction. A designated use is a short description, in the state or tribe's laws, of what its goals are for the waterbody. They are kind of like a "vision statement" for the waterbody. In adopting designated uses, states and authorized tribes work with the stakeholders to identify a collective goal for their waters that they intend to achieve as they manage their waters. A key point about designated uses is that they can be future "forward reaching" goals for a waterbody – they do not need to be currently attained in order to be designated. A state or tribe may set a Designated Use that it wishes to strive for in the future, even if it is not currently being attained. One note to make, some states and authorized tribes call them "beneficial uses" or other terms, but the Federal regulations call them "designated uses" so that's what we use.

The CWA itself provides some example designated uses. Section 101 (a) talks about designating uses. 101 (a) requires states and authorized tribes to designate waterbodies consistent with the goals of "water quality that provides for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water, unless it is determined that attaining such uses is "not feasible." So the two uses in bold are commonly referred to as the "fishable/swimmable where attainable" goal uses, or the "CWA 101(a)(2) uses." We interpret the CWA to presume that states and authorized tribes will have at least these goals among their designated uses for all their waters, unless they go through a process to determine that those 101(a)(2) uses are not attainable.

Section 303 of the Act also tells states and authorized tribes that, when developing designated uses for their water, they need to "consider the use and value of the water for: public water supply, meaning water suitable for drinking after treatment; agricultural, navigation; and other uses, such as ceremonial or cultural uses. Authorized tribes and states have developed many different designated uses for their waters. Each designated use will have a suite of Criteria that describe the conditions that support that designated use.

How the state or authorized tribe wants to classify uses is the state or tribe's choice. The EPA has no specific recommended way of classifying waters. Different states and authorized tribes have different ways of classifying uses. Some states and authorized tribes use categories, similar to what we saw in the previous slide, and may even express them exactly how the CWA does. Other states and authorized tribes use a class system, where you have classes based on quality, or based on waterbody type. Class A might be "extraordinary" and Class B "excellent" and Class C "good." The state or tribe would then describe for each of those classes what it means for a waterbody to consider it Class A, and what the specific activities Class A is being protected for.

Here are some designated uses in the water quality standards for the Pyramid Lake Paiute Tribe in Nevada. The tribe has adopted the designated uses of "cold freshwater aquatic habitat" to help satisfy the "protection and propagation of fish, shellfish and wildlife" goal and "water contact recreation" to help satisfy the "recreation in and on the water" goal. Now, since the tribe has adopted uses that protect the CWA Section 101 (a)(2) goal uses, the EPA approved these uses and the standards.

So now that we know that designated uses are goals for the kinds of activities we want to be supported in a waterbody, we need to remember it's not only the activity but the water quality good enough to support that activity. For each designated use, we must consider what kinds of pollutants would affect it. For aquatic life related uses, think about what fish and other aquatic life need. For example, the fish and other aquatic life that live in that stream need enough dissolved oxygen, and they have certain maximum and minimum temperatures they can tolerate. They also have maximum amounts of certain pollutants that they can tolerate, like heavy metals such as copper and aluminum. So to support the aquatic life uses the state or tribe needs to determine appropriate levels of those parameters that would be protective. What's the temperature range that's protective? How much dissolved oxygen do they need? What's the maximum amount of aluminum that's protective? Similarly, for recreational uses, we need to think about what humans need to be safe using the water, will they get sick from bacteria? What would be the maximum levels to ensure a low likelihood of people getting sick from the water?

The second component of a water quality standard is water quality criteria. Before we launch into our criteria discussion, let's check in with our little road map and see where we are in the process. When we talked about designated uses, we learned that designated uses are the state's or authorized tribe's management goals or objectives for a waterbody, and that they are specified in state or tribal law.

Water quality criteria serve to "flesh out" or "put meat on the bones" or more specifically describe what is meant by the designated use. If I am told to write a permit to discharge pollutants to a water, and the permit must protect "aquatic life," I am going to need a little more information about what levels of pollutants will be protective of aquatic life. That is what criteria do. They describe the level of water quality that must be achieved to meet the designated use. And in the diagram, you can see that they serve as the basis for point source permit limits. Water quality criteria also help us determine if a waterbody is meeting its designated uses, or if it is "impaired" and needs a TMDL, which can be thought of as a restoration plan. But more on that later.

Criteria can be defined as either numeric limits or narrative statements. An example of a numeric criterion would be "To protect aquatic life, dissolved zinc shall not exceed 90 micrograms per liter as a one hour average more than once every three years." An example narrative criterion would be "To protect all designated uses, there shall be no toxic materials in toxic amounts." Note that narrative criteria are qualitative, not quantitative. We will talk about why and when these are used on the next slide.

Numeric criteria on the other hand are quantitative, and consist of a 1) magnitude or how much, 2) duration or how long, and 3) frequency or how often. Magnitude is the concentration of a pollutant, usually in some fraction of a gram per liter of water. In our example, this is 90 micrograms per liter. Duration is the period of time over which this concentration is averaged. In our example, the averaging period is one hour. Frequency is how many times the magnitude and duration can be exceeded in the environment and still be protective. The EPA's recommended frequency for many aquatic life parameters is not more than one every three years as an average.

It is the responsibility of states and authorized tribes to consider which criteria are needed to protect the designated use, and then incorporate those criteria into their water quality standards. The EPA publishes scientifically-based water quality criteria recommendations under section 304(a) of the CWA. These criteria are commonly used as the basis for state and Tribal water quality standards. However, the regulation allows states and authorized tribes to develop their own criteria based on scientifically defensible methods, or to make site-specific modifications to the EPA's criteria recommendations.

The 304(a) criteria are scientific recommendations and are not federal standards. States and authorized tribes may adopt criteria more stringent than the EPA's 304(a) criteria recommendations. States and authorized tribes can consider which criteria are needed to protect their designated uses and then incorporate these criteria into their water quality standards. This concept of water quality criteria can also be confusing, because the CWA uses the word in 2 ways. The first is in what I would call the "Section 304(a) sense." The EPA publishes scientifically-based water quality criteria recommendations under section 304(a) of the CWA. The 304(a) criteria are scientific recommendations, and they do not consider the economic or technical feasibility of meeting the criteria. 304(a) criteria have no force of law, and are not Federal standards. The CWA also talks about criteria in what I would call the Section 303(c) sense. These are criteria that have been adopted by a state or authorized tribe and approved by the EPA, and that are effective for purposes of the CWA. By "effective for purposes of the CWA," we mean that they can be used for things like developing permit limits, and making decisions about whether or not a waterbody is meeting its water quality standards. They are in essence the foundations of water quality standards.

What do the regulations tell states and authorized tribes about the requirements for their criteria? Tribal and state criteria must protect the designated use or uses for that water; be based on a sound, scientific, rationale; have sufficient parameters to protect the designated use; and support the most sensitive use if the water has several designated uses. Finally, it is important to remember that tribal and state criteria can be more stringent than the EPA's recommendations.

So here is a little more description about when and how numeric criteria are used versus when and how narrative criteria are used. Here is what the regulations say about requirements for criteria. Authorized tribes and states should adopt their numeric criteria based on: the EPA's 304(a) guidance; the EPA's 304(a) guidance modified to reflect site-specific conditions; or other scientifically defensible methods. The regulations also say authorized tribes and states should adopt narrative criteria: where numeric criteria cannot be established; or to supplement numeric

criteria. Remember, narrative criteria are qualitative, not quantitative so an example narrative criteria may be "toxic materials may not be present in toxic amounts."

Remember when we talked about designated uses being the goals for a waterbody? You may need different kinds of criteria to meet different designated uses. As required by Section 304(a) of the Act, the EPA has published recommendations for, and authorized tribes and states have adopted water quality criteria for, several types of criteria. Each type has a different protective focus. Examples include: aquatic life criteria, which are based on toxicity tests performed on various aquatic species from at least eight different families, and are developed to protect organisms from both short term (also known as acute) and long term (also known as chronic) effects; human health criteria protect humans from specific chemical pollutants from consumption of both water and fish; and bacteriological criteria set limits on how much bacteria, such as E. coli , can be in a waterbody, and protect recreational and other uses, where consumption is possible or even likely. For some types of criteria (like biological criteria), the EPA has not developed numeric criteria, but has developed methodologies that states and authorized tribes may use to develop numeric criteria. The different types of water quality criteria collectively provide a valuable tool for setting water quality standards and making water quality management decisions that help protect the broad diversity of life and designated uses affected by water pollutants.

Here is another numeric water quality criteria example from the Pyramid Lake Paiute Tribe in Nevada. Water quality standards, along with the associated designated uses (which the tribe calls "beneficial uses") are listed for chlorides, E. coli, and dissolved oxygen. This slide shows only a few of the tribe's numeric criteria. A complete list can be found in the tribe's water quality standards.

I like this slide, because you can clearly see how the tribe has adopted numeric chloride and dissolved oxygen criteria, among others, to protect waters designated with aquatic life and special ecological significance uses, and numeric E. coli bacteria criteria to protect waters with water contact recreation uses.

The third required part of a water quality standard is an antidegradation policy and implementation procedures. Here is the schematic again to remind you where antidegradation fits into the water quality standards program. We've spent some time talking about how designated uses and criteria are aimed at making sure that waters have water quality good enough to support the CWA goals. But what about when waters are already meeting those goals? A state or authorized tribe's antidegradation policy describes how the state or tribe is going to keep waters that are already clean, clean. It describes what must be done when a waterbody has water quality that is already better than that necessary to protect the CWA goals. The antidegradation policy describes what steps will be taken to protect such waters.

The federal water quality standards regulations section on antidegradation is quite short and succinct. The first requirement is that states and authorized tribes must develop and adopt a statewide or reservation-wide antidegradation policy to protect existing in-stream uses for all Waters of the U.S.; high quality waters, that is, water quality that is better than the levels necessary to support propagation of fish, shellfish and wildlife and recreation in and on the

waters; and outstanding national resource waters or ONRWs, which are waters designated by the state or authorized tribe for specific enhanced protection. These three categories are commonly referred to as "tiers of protection," with the existing uses as Tier 1, high quality waters as Tier 2, and ONRWs as Tier 3.

Tier 1 is for the protection of existing in-stream uses for all waters, and can be considered the floor of water quality. Tier 2 provides a higher level of protection for what the state or authorized tribe determines are "high quality waters." Tier 3 provides a prohibition of any lowering of water quality by any regulated activity in waters that are determined to be ONRWs, for example, waters with exceptional recreational or ecological significance, such as in a wildlife refuge or in a park. States and authorized tribes decide which waters to put into this tier. I'll get into Tier 2 a little more because it's the main part of the program.

Designated uses and criteria focus on getting and keeping waters at the CWA 101(a) goals. They define the minimum requirements for those goals, and help determine what management actions are necessary to get them there. So, in the diagram, we are talking about the waters that are at or below the line. If we are below the line, below the minimum requirements of the Act, designated uses and criteria tell us where we need to go.

A state or authorized tribe's antidegradation policy helps us decide what to do when we are "above the line," when we have water quality that is not only meeting the 101(a)(2) goals, but is actually better, meaning you could add additional pollutants and it would still meet those goals. These "high quality waters" have what is called "assimilative capacity." So, the question is, what does the state or authorized tribe want to do with those waters, do they want to keep them at that higher, cleaner level, or permit some degradation, as long as the water still meets the 101(a) goals? One aspect of antidegradation is a review process, where a state or authorized tribe describes how it will make decisions about proposed activities that potentially lower water quality where the water quality is better than 101(a)(2) goal levels.

I always do better with a real world example, so let's walk through a made up example of a Tier 2 antidegradation review. First, we identify the high water quality that would be affected by the proposed activity. Heather's Beautiful Lake is high quality for zinc, and zinc is the parameter for which water quality would be lowered if the activity were allowed. The criterion is 120 micrograms per liter and existing condition is 20 micrograms per liter, so you could theoretically bring it up another 100 micrograms per liter and still meet the criterion. Tom's widget factory applies for a discharge permit that would bring zinc to 50 micrograms per liter rather than 20 micrograms per liter. That is still lower than the criterion, but it would mean degrading the water quality. This will trigger an antidegradation review.

So we know that based on our examination of the lake's water quality, it is high quality for zinc, and the proposed discharge would degrade the water quality for zinc. Now we want to ask, is this degradation really necessary? So, we do an alternatives analysis, as required in the regulations to see if there are other ways that the activity could be conducted to either prevent or minimize the degradation.

Perhaps in this case, the widget factory could find a way to reuse the zinc in the widget-making process so that it wouldn't need to be discharged, or perhaps there are additional technological methods that the factory could install to prevent so much zinc from being discharged.

Then, after we select an alternative and we find it will still cause degradation, we ask is this activity truly important for social or economic development? This analysis might include consideration of things such as implications of the proposed activity on public health, tourism, the local tax base, and local employment in the area of Heather's Beautiful Lake.

After we do those analyses, there are still several things to consider before we can make a state or tribal determination of whether the activity should be approved or not. We need to ensure that existing uses are protected, ensure achievement of the highest statutory and regulatory requirements for point sources (that is, all point sources are at least meeting their tech. based limits) and ensure implementation of cost-effective and reasonable best management practices for non-point sources, where required by the state or authorized tribe. We have to coordinate with the relevant intergovernmental entities, and have a public participation process.

These are the basic elements of an antidegradation review. Only after this review process can a state or authorized tribe determine whether to authorize the activity that would degrade water quality. To wrap up, I'll repeat my elevator speech on antidegradation. Antidegradation provides a decision-making process that states and authorized tribes use to determine how and how much to protect their high quality waters.

We've talked about the core parts of water quality standards, which are designated uses, criteria, and antidegradation. Those are really the heart of the program - but there's more. Section 131.13 of the regulation allows states and authorized tribes to adopt discretionary policies that affect the application and implementation of water quality standards. These policies generally include mixing zones, variances, and low flows. Any such policies adopted by states and authorized tribes are subject to the EPA's review and approval. This is literally all the regulation says about these discretionary policies.

We have covered a lot of ground. Please see the website list for more information on designated uses, criteria and antidegradation. And now Janita will take us to our second activity.

Janita Aguirre
Thanks, Tom. Hopefully you all remember our hypothetical State of the Art and its popular Bass Lake. If not, here is a quick refresher. Remember Bass lake is a popular recreation area and it also serves the City of Newport as a drinking water source. The next activity, while simplified for the purpose of this web presentation, hopefully gives you a general understanding of how the water quality standards process works and serves as a way to test your knowledge of what you have learned so far.

You should now see a poll question in the bottom right-hand side of your screen. Based on our discussion of designated uses, which uses would you apply to Bass Lake? Please check all that apply. The choices are: cold-water aquatic life use; warm-water aquatic life use; primary contact

recreation; domestic water supply; livestock watering; and irrigation. Please click on all of the choices that apply.

While we are waiting for the results, let's take time to answer a question we often get related to designated uses. The question is: "You say designated uses are goals for waters whether or not they are currently attained. What happens if the uses aren't attained right now?" I am going to turn to Tom for the answer.

Tom Gardner
Thanks, Janita. The whole idea of a designated use is that it's a goal for what the state or authorized tribe wants for that water body generally. If the use is attained, they can focus on managing the water to keep maintaining that use. If the use is not attained yet, they would aim to manage the water body to restore it to a better condition where it supports the use. One tool for doing that is a restoration planning tool called a total maximum daily load, or TMDL, which we are going to discuss later in this web presentation.

Janita Aguirre
The best answers here are "warm-water aquatic life use," "primary contact recreation," and "domestic water supply." As we told you Bass Lake is used for outdoor recreation; therefore "primary contact recreation" would be an appropriate designated use.

We also know that it is a warm water system. Therefore, we would infer that warm-water aquatic life would also be a use for this waterbody. Lastly, we have told you that the waterbody serves as a drinking water source for the City of Newport. Therefore, the waterbody is also used as a "domestic water supply."

As you may remember, a state or authorized tribe can designate uses based on the 101(a)(2) goals. These uses do not have to be currently attained. Since we haven't talked about irrigation and livestock watering as goals for Bass Lake, we haven't included them as designated uses. However, these could also be designated uses, at the state's or authorized tribe's discretion.

Here is a fictional excerpt of the EPA's CWA Section 304(a) criteria recommendations for the fictional pollutant, balognium. The EPA's 304(a) criteria recommendations for balognium include those for aquatic life and human health.

Using these fictional criteria, please respond to the poll question in the bottom right-hand side of your screen. The question is: Is State of the Art required to adopt these 304(a) criteria recommendations for Bass Lake? Please choose only one answer.

While everyone is responding, let's answer a question we often get related to criteria. The question is: How do you know what criteria you need to support a use? Tom, I am going to pass it off to you again for the answer.

Tom Gardner
Thanks, Janita. The EPA's 304(a) guidance is a good place to start. The criteria recommendations are sorted for aquatic life uses, recreation uses, and human health uses. For

human health uses, the criteria are further divided into criteria for where people will be both eating the fish and using the water body as a water source called "water plus organism criteria," and situations where people will just be eating fish from that water called "organism only" criteria. The EPA generally expects states and authorized tribes to have criteria for pollutants for which we have published guidance and that "are known or might reasonably be expected to interfere with the designated use." Many states and tribes have just adopted the EPA's criteria, but as I said that is not required. States and tribes have made demonstrations that a numeric criteria for a particular pollutant is not needed in their state or reservation because it is not used there for any purpose, or for other reasons there would be no reasonable expectation that it might interfere with the designated use. Many states and authorized tribes look to neighboring states' and/or tribes' criteria, and the EPA Regional offices are always ready to help with decisions like that.

Janita Aguirre
We have another question related to criteria that we often get. It goes something like: Hey, I've looked at the EPA's recommended 304(a) criteria on your website, and some of them are pretty stringent. Does the EPA consider economics and the cost of treatment for a pollutant when it develops criteria? Tom, how would you answer this?

Tom Gardner
Well, the answer is both. The Act and the regulations require the EPA to develop our 304(a) criteria based on the latest scientific information on the effect a constituent concentration has on a particular aquatic species and / or human health. So we are constrained in what we look at when we develop criteria and are limited to looking at scientific information, and limited to just looking at information on the effects the particular pollutant has on aquatic species when we are developing aquatic life criteria or on human health when we are developing criteria to protect human health. So Congress told us not to use economics in developing criteria, we pretty much don't.

We don't have nearly enough time to talk about it today, but economics can and does play a role in water quality standards in a couple of places. It can play a role in determining what is the appropriate designated use, and it can play a role in what is called an antidegradation analysis. We actually will talk about that in a little bit. The costs of treatment technologies are also considered when developing technology based effluent limits, and we will talk a little bit about that when we talk about NPDES permits.

People sometimes get confused, because other laws do let the EPA consider costs in developing recommendations. For example, the Safe Drinking Water Act lets the EPA consider costs in developing MCLs, or maximum contaminant levels, which are the maximum level of a particular contaminant permitted in drinking water supplied by a public water system.

Janita Aguirre
Thanks, Tom. And here are the results to the poll. Again, the question was: Is State of the Art required to adopt these 304(a) criteria recommendations for Bass Lake? The appropriate answer here is D. States and authorized tribes are not required to adopt the EPA's 304(a) recommendations as long as the tribe's or state's criteria are sufficiently protective of the

designated use, and are scientifically sound. If a state has a lot of site specific data or research on a specific lake, for example, then it might be able to develop more appropriate site-specific criteria to adopt. Answers B and C are not correct because we mentioned earlier that the state has designated uses that protect aquatic life and human health, so we need to make sure that criteria are adopted to protect both of those uses.

Now for the next question, we'll look at another aspect of water quality standards for Bass Lake. State of the Art's antidegradation policy assures that water quality continues to support designated uses. You should now see a poll question in the bottom right-hand side of your screen. State of the Art manages Bass Lake as a Tier 2 water. What does this mean? Please check all that apply.

While we are waiting for you to respond, let's take time for a question that comes up a lot related to antidegradation. The question is: How do I find out where ONRWs are? Tom, how would you answer this?

Tom Gardner
Sure, Janita. States and authorized tribes decide for themselves which of their waters they want to assign ONRW protection, or the most stringent type of antidegradation protection. So, the best way to find out the most up-to-date information on ONRWs in your state or on your reservation is to contact their water quality standards program directly. In some cases, you can find a list of ONRWs by searching the state or tribe's water quality standards program website.

Janita Aguirre
Thanks, Tom. And here are the results to the poll. The question again was: What does it mean when we say that Bass Lake is managed as a Tier 2 water? The correct answers are B, C, and D. Tier 2 refers to high quality waters, so answer B is correct, which can also be thought of as waters that could receive additional pollutants and still meet the basic CWA 101(a)(2) goals or answer D. Answer C is also correct, because existing uses protection is "Tier 1" of antidegradation, and applies to all Waters of the U.S., so for a high quality water, it would also receive Tier 1 or existing uses protection. Answer A is not correct, because ONRWs or Tier 3 waters receive a more stringent type of protection than high quality or Tier 2 waters. And now I will pass it off to Heather Goss.

Heather Goss
Hello everyone. We will spend the rest of the presentation talking about implementation.

As we've already mentioned, Tribal and state water quality standards are the foundation of the water quality-based approach. Water quality standards have the primary purpose of defining goals for surface waters and criteria to support those goals. The goals for a waterbody are defined by establishing designated uses. Water quality criteria describe the conditions that, if met, will support the designated use.

This conceptual diagram shows water quality standards serving a variety of functions in water quality management. Examples of just some of the water quality management actions that are based on water quality standards include: setting limits and requirements in point source

discharge permits such as NPDES permits, and licenses through Section 402; the basis for a state or tribe certifying that federally issued permits or licenses will be consistent with their water quality standards; setting targets for calculating TMDLs; and assessing waterbodies and listing of impaired waters on the 303(d) list.

We'll talk a bit more about all of these later in the presentation. This conceptual diagram shows that everything starts with water quality standards. When you rewind to see why you have certain permit limits or TMDL targets, it should be based on the goal of meeting water quality standards.

Maybe I'm biased because I work in the standards program, but I kind of think about water quality standards as being at the center of the Water Program universe, since so many other programs are based on standards.

I know it sounds confusing, but water quality standards are not directly enforceable. Instead they are implemented in other water quality programs. Water quality standards are like the plan or theory while other water quality programs put the standards into action. One of these programs is the NPDES permitting Program, which since its introduction in 1972, has contributed significant improvement to the nation's water quality. I want to point out that NPDES is not the only permit program where water quality standards are implemented, but it is the only one we will talk about in great detail today.

In order to achieve the CWA goals, one tool used is to place controls on sources of pollutants that may be impairing or threatening the quality of our Nation's waters. In many jurisdictions, the discharge of pollutants from point sources is a significant factor to address when managing the condition of water bodies.

Section 402 of the CWA establishes the NPDES permitting program. Under this program, any point sources that discharge or propose to discharge pollutants into waters of the United States must obtain a permit. Such permits contain either numeric or narrative limits and requirements for the amount of pollutants to be discharged under certain conditions.

As we discussed earlier, a point source is defined as "any discernible, confined, and discrete conveyance, from which pollutants are or may be discharged". The full definition of the word "pollutant" is quite broad, and is available at Title 40 of the Code of Federal Regulations part 122.2. It includes a whole list of things you see listed on the slide, such as dredged spoil, solid waste, and sewage.

The definition of pollutant does not include sewage from vessels and water, gas, or other material injected into wells by oil and gas production under certain conditions. States and authorized tribes issue NPDES permits to point source dischargers, such as publicly owned treatment works or industrial facilities. In cases where the state or tribe is not authorized to administer the NPDES program, EPA is responsible for issuing NPDES permits to point source dischargers in that jurisdiction.

During the permit development process, an NPDES permitting authority considers two effluent limitation derivation approaches established in the CWA. We won't spend much time on either of these, but the approaches are referred to as technology-based effluent limits and water quality-based effluent limits.

Technology-based effluent limits or TBELs for short reflect pollutant reductions that can be achieved by demonstrated technologies specific to discharger categories, or subcategories. For example, the EPA published an effluent guideline for glass manufacturing so that glass manufacturers must meet certain levels of controls on discharges of specific pollutants relative to their industry, such as total dissolved solids. TBELs are required under the regulation as the "minimum level of control that must be imposed" in an NPDES permit. These limits are based on the performance of actual treatment systems or other pollutant control technologies and developed independently of the potential impact of a discharge on the receiving water. The EPA publishes effluent limitation guidelines based on analysis of available technology and feasibility. Water quality-based effluent limits or WQBELs are limits that are included in a permit when something more than a TBEL is necessary to insure a criterion is not exceeded. WQBELs are calculated to ensure the relevant water quality standard(s) are met.

In general, a permit writer will determine what permit limits would be required by the tech-based approach, and also what permit limits would meet the water quality standards per the water quality based approach. The permit writer would compare the limits, and choose the more stringent limit as a condition of the NPDES permit.

Where a state or tribe is not authorized to administer or does not administer the NPDES program, the appropriate EPA Region is responsible for issuance of NPDES permits for discharges in that jurisdiction. Where the EPA issues an NPDES permit, Section 401 of the CWA says that states and authorized tribes must have an opportunity to certify the permit requirements. This is to ensure that as long as the discharger follows the conditions of the permit, it will comply with all applicable state or tribal water quality goals and will be consistent with Federal effluent limitations and state or tribal law.

The authority to provide this certification is described under Section 401 of the Act and is part of the role of the state or tribe in administering its water quality standards program. It is important to note, however, that the state or tribe may approve (either unconditionally or with additional conditions), waive, or deny certification. If a state or authorized tribe waives certification, then the permit will be issued as is. If a state or tribe denies certification, then the permit will not be issued.

The next topic of discussion is water quality monitoring and assessment. Water quality monitoring is used to gather information on the condition of our nation's streams, lakes, estuaries, and coastal waters. There are many ways to monitor water conditions. For example, to look at chemical characteristics, you could sample the water column, sediments and fish tissue to determine levels of key constituents such as dissolved oxygen, nutrients, metals, oils, and pesticides. You can also monitor physical conditions such as temperature, flow, sediments, and the erosion potential of stream banks and lake shores. Biological measurements of the abundance and variety of aquatic plant and animal life and the ability of test organisms to survive

in sample water are also used to monitor water conditions. Monitoring can be conducted at one specific location on a continuous basis or at selected sites on an as-needed basis, to answer specific questions, to characterize a watershed, or on an emergency basis, such as after an oil spill.

Water quality monitoring serves an important function in an effective water quality protection program. There are lots of different purposes for monitoring, including: characterizing current conditions; identifying trends over time; identifying emerging problems; and determining the effectiveness of activities aimed at improving or maintaining conditions.

Now I want to draw your attention to the last two bullets in the red box. These are why we care about monitoring in the water quality standards program. Let's think back to the overarching CWA goals to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Well, how do we know if we're meeting those goals? We set designated uses for a waterbody, for example to protect aquatic life and recreation, and those are goals for the waterbody. There are activities that affect that waterbody, like discharges of pollutants from a water treatment plant and polluted runoff. If we don't take a look at the water quality, we won't know whether the water is too polluted to meet the goals, whether it meets or is better than the goals, or whether it's getting more or less polluted over time.

For example, if your goal is to have a waterbody that supports a healthy cold-water aquatic life community, you might monitor the temperature, dissolved oxygen (DO) which is temperature-dependent, and other pollutants to which the biota are sensitive, like aluminum which can be toxic to fish at certain concentrations.

Monitoring data can help to determine whether water quality standards are being met. If they're not being met, the waters need to be restored. I'm highlighting this because this is critical to the water quality standards program – how do we work to restore waters that are not yet meeting their water quality standards? We'll get to this more in a few slides when we talk about TMDLs, but I want to point it out now, because monitoring is how we identify waters that need restoration.

States and authorized tribes have a specific requirement to monitor. Every two years, states and authorized tribes are required by the CWA to submit a document called the "National Water Quality Inventory Report" to Congress. This is commonly referred to as the "305(b) Report" named after the section of the Act that requires it. It's also often referred to as the "Integrated Report." This report characterizes the state or tribe's water quality for Congress and the public. It also documents assessment methodology for water quality standards attainment decisions, and categorizes state or Tribal waters based on water quality standards attainment status. Waters that are not attaining water quality standards or 'impaired' waters are listed on what is known as the "303(d) list" named after the section of the Act explaining that requirement. The 305(b) report also establishes restoration priorities for the list of impaired, or 303(d) listed waters; that is, it prioritizes the list of waters slated for TMDL development. It also establishes monitoring priorities for the next two years.

As we stated on the previous slide, states and authorized tribes have a special responsibility to monitor because of the requirements in Section 305b in the CWA that they report on the condition of their waters every two years. Resources are often a concern with monitoring, because it can get expensive to send field crews out, analyze samples in a laboratory, and work with the data. States and authorized tribes authorized for the CWA Section 106 program may apply for grants that can be used to develop monitoring programs. Note that for authorized tribes, there is a specific process to go through to get authorization for the water quality standards program to receive 106 grants. Getting authorized for the 106 program is a separate process from getting authorized to administer the water quality standards program.
Permitted dischargers also usually have requirements to monitor their discharge. These requirements are written in as conditions in their permits.

There are lots of others who can and do monitor water quality for various reasons. For example, university researchers may be doing studies about stream or lake processes, or watershed groups may be looking to track progress as a stream is being restored.

With so many different entities participating in monitoring efforts, it's important to note that there are data quality guidelines to make sure that monitoring produces scientifically defensible results that can be shared and so that different groups can coordinate monitoring efforts. In response to the EPA guidance, states and authorized tribes have prepared comprehensive, long-term monitoring strategies that address all water types, including those such as wetlands for which few data currently exist. The states, authorized tribes, and the EPA are also taking steps toward streamlining and improving water quality monitoring and assessment by integrating monitoring and reporting requirements under Sections 305(b) and 303(d) of the CWA. The EPA is also working toward improving electronic reporting of monitoring data to make it increasingly accessible to the public and to decision-makers at all levels of government.
For more information on monitoring, please see the website list.

Next we will talk about TMDLs (or Total Maximum Daily Loads). So, what happens to waters that are determined to be impaired? There's a tool called a TMDL precisely for the purpose of planning restoration of an impaired waterbody. Section 303(d) of the CWA requires the development of TMDLs for all waters listed on the 303(d) list as impaired by pollutants.

A TMDL is a calculation of the maximum amount of a particular pollutant that a waterbody can receive and still meet water quality standards. It also serves to allocate, or assign portions of that load, among the various sources of that pollutant. A TMDL is calculated as the sum of individual wasteload allocations or WLAs for all allowable loadings from the point sources and load allocations or LAs for all allowable loadings from the non-point sources that contribute to the waterbody in question. A margin of safety or MOS is also included, to make sure that the calculation is protective enough to meet water quality standards. The MOS would include natural background levels of the pollutant of concern.

Just to refresh your memory, a point source is a discrete conveyance like a pipe. A non-point source does not have a single point of origin or is not introduced into a receiving stream from a specific outlet. An example of a non-point source is agricultural runoff. A state or authorized

tribe can prioritize waterbodies for TMDL development, but in the end each waterbody / pollutant combination on the 303(d) list is slated to have a TMDL developed.

A TMDL is not just a simple calculation, however. The key thing to remember is that the whole idea of a TMDL is that it's a tool to help plan restoration of impaired waters. We will talk more about this on the next slide, but as an example, the Los Angeles River was found to be impaired, or not meeting water quality standards, because of trash. As such, a TMDL for trash was developed. Through the undertaking of the Trash TMDL, a study was completed to identify the spatial distribution of trash in the River coming from two different watersheds. The study examined the amount of trash accumulating in city-owned catch basins over the course of several years. The TMDL articulated what limits on trash would be needed. And, it was concluded that implementing control measures first in the highest trash generating areas would have the greatest impact in reducing trash discharged to the Los Angeles River. Now, the Los Angeles River may also be impaired for pollutants other than trash, but as I mentioned before, separate TMDLs are needed for each water body/pollutant combination on the 303(d) list, so the Trash TMDL only addresses the trash problem. Other TMDLs might be needed if there are other impairments on the waterbody. A TMDL for trash is easy to understand visually, but is somewhat unusual. There are lots of TMDLs for other pollutants such as mercury, nutrients, metals and pathogens.

We are going to walk through the process of TMDL development on this slide. A TMDL is necessary when a waterbody is not meeting water quality standards for a specific pollutant. Moving to the second box on the slide, for an impaired water, a TMDL can be thought of as a restoration plan. In order to develop a TMDL you need to do a study to calculate the amount of loading from each source, set the maximum pollutant load, and estimate necessary pollutant reductions to meet water quality standards.

After doing all of that analysis, an implementation plan is also developed to identify permit controls or best management practices needed to make necessary pollutant reductions. TMDLs are not self implementing. This means that the limits set in the TMDL are implemented for point sources through permit limits under the NPDES program. If a TMDL identifies non-point sources, such as agricultural runoff, as a major source, states and authorized tribes may apply for grants to help address the non-point sources.

Implementation may include many different types of pollutant reduction measures. For example, point sources such as industrial facilities may be able to install additional controls so that they reduce discharges of that pollutant. Another example you can see in this photo is reduction in polluted runoff, or non-point source pollution, through the use of a rain garden which can help absorb water during storms to mitigate excessive stormwater runoff. There is a special grant program under Section 319 of the CWA for grants to address non-point sources.
And now for our third activity. Take it away, Janita.

Janita Aguirre
And we are back in the hypothetical State of the Art. Only, now we are out of Bass Lake and moving south into the Wet River. As you may recall, south of Bass Lake, Wet River is a wider warm water system. We have the City of Newport and its POTW to our west. The POTW discharges directly into the Wet River. You may also remember that the POTW is the only one

in the state. The Newport suburbs rely on septic systems. They are also largely made up of communities, and fertilizers used to maintain the large green lawns in these areas have been linked to large amounts of phosphorous and nitrogen in the Wet River. Other nitrogen and phosphorous sources include agricultural runoff that enters Horse Creek from the upstream Concentrated Animal Feeding Operation. Wet River has been placed on the 303(d) list of Impaired Waters and requires a TMDL for nutrients.

You should now see a poll question in the bottom right-hand side of your screen. The question is: What is a TMDL? Please check all that apply.

While we are waiting for the results, let's go through a question related to monitoring. The question is: "How would I find data quality guidelines for volunteer monitors?" Heather, I am going to hand this one over to you.

Heather Goss
Thanks, Janita. Many volunteer monitoring programs have their own data quality guidelines and train their volunteers using these guidelines, so to learn more about the guidelines you can check with the specific organization doing the monitoring. Their guidelines are based on the ultimate purpose of the monitoring program, and the use and users of the data that its volunteers collect. The stringency of the guidelines in each case depends on the purpose of the data collection. For example, if you're collecting data to be used primarily for educating the community, the guidelines might not be so stringent. However, if the state, county, or others are intending to use your data to identify impaired waters, the guidelines would be more stringent. Volunteer data quality guidelines may even be state-approved or EPA-approved, especially if the program works closely with its state water quality agency and submits data for the agency's use. Your resources sheet contains links to information from EPA and some other national organizations on volunteer monitoring.

Janita Aguirre
And here are the results of our poll. The question was: What is a TMDL? The correct answers are B and D. TMDLs are a calculation of the maximum load of a pollutant that a waterbody can receive and still meet water quality standards. TMDLs can also be thought of as plans for restoring a waterbody that is not currently meeting standards. Answer A was the definition of an NPDES permit. Answer C may have looked familiar, but it was missing load allocations, or LAs, for non-point sources and a margin of safety, or MOS. That was somewhat of a trick answer there. Here is a graphical representation of a watershed, which can be used to think about the Wet River watershed.

You should now see a poll question in the bottom right-hand side of your screen. Which pollutant sources within the Wet River watershed must be included in the calculation of the nitrogen and phosphorous TMDL? Please check all that apply.

While we are waiting for the results, let's go to a question related to TMDLs. The question is: "How do you implement the non-point controls of a TMDL?" Heather, can you answer this one for us?

Heather Goss
Sure, Janita. Some state regulations require the implementation of NPS controls similar to the requirements for point sources of a pollutant. However, most states do not have regulatory authority to require NPS controls. In these states, NPS reductions are achieved through both voluntary and incentive based (cost share) efforts.

Janita Aguirre
OK, and we have another common question related to TMDLs. The question is: Can a waterbody have more than one TMDL? Heather, can you answer this one?

Heather Goss
Sure, Janita. Yes. A TMDL is required for each impaired pollutant / waterbody combination. To support a designated use for a waterbody, you need to look at the multiple parameters that affect that use. So, if a segment of your state's river has an aquatic life use, whether that use is supported or not depends on lots of parameters, like mercury, aluminum, pH, dissolved oxygen, and others. If the water is not meeting the criteria for mercury, or in other words, if the mercury levels are too high to support an aquatic life use, the river is impaired for mercury and needs a TMDL for mercury. If the water is not meeting the criteria for mercury and aluminum, then both of those parameters are impairing the water body, and it needs a TMDL for mercury and a TMDL for aluminum.

Janita Aguirre
And here are the results. The question was: "Which pollutant sources within the Wet River watershed must be included in the calculation of the nitrogen and phosphorous TMDL?" and you were instructed to check all that apply. Let's see.

And the answer here would be all of them. If you remember, a TMDL is the sum of the point sources, non-point sources, and a margin of safety including natural background levels.
As we discussed, the TMDL implements permit controls and/or best management practices needed to make necessary pollutant reductions to meet water quality standards. An NPDES permit is one permitting mechanism the state can use to control pollution into the Wet River.

You should now see another poll question in the bottom right-hand side of your screen.
For which of the following pollutant sources can the state require a NPDES permit? Please click on the choice that best matches your answer. While we are waiting for the results, let's answer a common question we received related to permitting. The question is: How do NPDES permits protect water? Heather, how would you answer this question?

Heather Goss
A NPDES permit will generally specify acceptable levels and requirements to limit pollution impact from discharges (for example, explicit numeric bacteria loadings, or an allowable range in pH). The permittee must design, operate, and/or modify the performance of its treatment to comply with its permit limits and requirements. Some permits might contain special condition requirements such as 'best management practices' to reduce overall quantity of pollutants, as a supplement to treatment(such as installing a screen over the pipe to keep debris out of the waterway) or additional monitoring and special studies to collect information that could be used

to determine future permit requirements. Through water quality-based permitting, NPDES permits apply a state's water quality standards to receiving waters to protect human health and aquatic life consistent with the CWA and state laws.

Janita Aguirre
Thank you, Heather. We have one more frequently asked question related to permitting: Typically, how long are NPDES permits effective? Heather, how would you answer this one?

Heather Goss
The CWA limits the length of NPDES permits to five years. Existing NPDES permits must submit an application to the permitting authority at least 180 days before the expiration date of its permit for renewal unless permission for a later date has been granted. In some cases, a permit may be administratively extended by a permitting authority on a case–by-case basis so long its application is submitted in accordance with federal regulations and state rules.

Janita Aguirre
Thanks, Heather. And here are the results. The question was: "To which of the following pollutant sources can the state require a NPDES permit?" For this question you had to remember that NPDES permits apply only to point sources, and that point sources are "discernible, confined and discrete conveyance, like pipes or POTW discharges." NPDES permits do not apply to non-point sources, which are sources of water pollution that do not meet the legal definition of 'point source,' so this essentially includes pollution that does not come out of a discrete conveyance like a pipe, channel, etc. Septic systems and agricultural runoff are considered non-point sources. Therefore, the correct answer here is A. And now, I will pass it back to Heather.

Heather Goss
Thanks Janita. The CWA and its regulations require public involvement at different points in the water quality standards process. The next part of this web presentation describes how the CWA and water quality standards regulations can be implemented and how you can participate in the process.

Over the next few slides we will talk through several unique groups involved in the water quality standards program: states and authorized tribes; stakeholder groups and the general public; and EPA Regions and Headquarters.

As you remember, we've been saying "states" throughout the presentation. When we say states, we mean territories too, since they function similarly to states. On this slide I'll focus on the roles of states in water quality standards, but a lot of this applies to authorized tribes too, so I'll point those similarities out. For authorized tribes, there are some unique characteristics to be aware of, which I'll highlight on the next slide.

As outlined in the CWA and its implementing regulations, states and authorized tribes are responsible for setting water quality standards for their waters. They are required to review their standards triennially, and adopt and revise standards as appropriate. They must engage the

public through at least one public hearing associated with the triennial review, and they are free to choose to engage the public beyond that.

Because water quality standards packages need to be consistent with federal requirements, states and authorized tribes work with the EPA Regions when developing and revising their standards. States and authorized tribes may have laws and regulations that are more stringent than the Federal requirements, but they must be at least be consistent with federal requirements. In order to make sure that the state or authorized tribe's water quality standards are consistent, there's a process where they submit their standards in a package to the EPA for review. The EPA must review and then act on water quality standards, to approve or to disapprove. If the standards are disapproved, the state or authorized tribe has the opportunity to remedy the problem and re-submit the standards for approval. In cases where that doesn't happen, the EPA may end up promulgating standards, though we really encourage states and authorized tribes to communicate with the EPA early and often in the standards development process so that the standards submission and approval process is smooth.

States generally issue NPDES permits for discharges in their own state; when I say generally, I mean that almost all states have authority to issue NPDES permits. EPA issues permits in the handful of states that do not have NPDES authority. States and authorized tribes may also use the CWA Section 401 certification process to grant, waive or deny certification for a federal permit or license that may result in a discharge to Waters of the United States. By granting the 401 certification, the state or authorized tribe is certifying that the discharge is consistent with their standards and other water quality goals. Lastly, states and authorized tribes can also monitor their own waters to assess progress in meeting water quality standards.

You will see on this slide that the roles of authorized tribes are similar to states, the black text is simply repeated from that slide because it also applies to authorized tribes. I've already talked about those roles on the previous slide, so I won't repeat here. Highlighted in blue are some unique things to point out for authorized tribes.

As we discussed earlier in the presentation, in 1987 Congress authorized the EPA to treat eligible authorized tribes in a manner similar to a state for the purpose of administering CWA programs, such as water quality standards, on their Reservations. As a refresher, "TAS" means "Treatment in a Manner Similar to a state." A separate TAS application and approval by the EPA is required for each CWA regulatory program that the tribe wants to implement. So, while states automatically have responsibility for administering their own water quality standards programs, authorized tribes have the choice of whether to take on the program or have the EPA administer the program for their area.

Recognizing that tribal water quality programs have different program goals, the EPA has designed three flexible approaches to implementing Tribal water quality programs. One of these approaches is the EPA-approved water quality protection approach, which includes adoption of water quality standards under the CWA.

For authorized tribes taking this approach, there are two principal tasks. First, the tribe must obtain approval from the EPA for TAS for the water quality standards program. As outlined in

the CWA Section 518(e) and 40 CFR 131.8, a tribe must show that: it is federally recognized by the Secretary of the U.S. Department of the Interior; it has a governing body carrying out substantial governmental duties and powers over a reservation; it is proposing to carry out water quality standards functions that pertain to the management and protection of water resources within a reservation and has authority to regulate water quality; and the tribe is reasonably expected to be capable of carrying out the functions of an effective water quality standards program.

Authorized tribes can apply for authorization to administer an NPDES permit program and issue NPDES permits that regulate discharges from point sources to reservation waters. The authorization process requires the tribe to demonstrate eligibility for TAS and to meet all of the legal, programmatic, and resource requirements established in the regulations for NPDES program approval.

Assuming responsibility of an NPDES program is more complex than that for many other CWA programs, therefore, if the tribe does not administer the NPDES program, the appropriate EPA Region is responsible for issuance of NPDES permits for discharges to tribal reservation waters. So in summary, there are a lot of similarities in the types of roles of states and authorized tribes in the water quality standards process. However, authorized tribes have the additional task of attaining TAS for each regulatory program that it plans to administer.

We talked about the states and authorized tribes' roles, but you may be wondering, how can people who are public citizens or other stakeholders or other groups, like environmental groups or the regulated community, participate in the water quality standards process?

We know that public involvement yields better, more real-world standards for protecting the public's shared water resources. Stakeholders and other members of the public often can provide key information that might not otherwise be readily available, for instance, information about waterbody uses and economic impacts. Also, public involvement can assist in identifying a range of viewpoints that are important in decisions about what are appropriately protective standards and implementation through permits.

Since public participation is important in governmental decision-making processes, there are some required opportunities to solicit and consider public input for different aspects of the water quality standards program.

The Federal Regulations require the public be involved when a state or authorized tribe prepares its water quality standards for submission to the EPA for action, or when they review their standards as required triennially. As mentioned before, there is a requirement for a public hearing, and there is a public comment period where the general public as well as stakeholder and other groups can provide suggestions, recommendations, and information to the state or authorized tribe.

There are some opportunities for public involvement that may come up outside the context of a full triennial review, such as when a state or authorized tribe proposes to change a designated use of a water body. Involvement in this activity can be particularly useful because information on

existing and designated uses can be directly solicited from the public. Also, when a state or authorized tribe considers allowing lowering of high water quality, an Antidegradation Tier 2 review must have a public participation component.

Also, public participation is required when issuing permits, such as NPDES permits, that authorize discharge of pollutants into Waters of the U.S. A draft permit will be published and open for public comment before the permit-issuing agency revises as appropriate and finalizes the permit. In some cases, there may be a public hearing as well.

So, we've talked about the states and tribes, and the public, but what's the EPA's role in the water quality standards program? First, I want to just point out what I mean when I say "The EPA." Water quality standards is a complex program, and lots of different staff are involved. We have a headquarters office located in Washington, DC, as well as Regional Offices and research laboratories located throughout the country. The Regional Offices and Headquarters have different responsibilities, which is why I want to show you the map of how the EPA divides responsibilities regionally.

Each of the 10 Regional offices is the primary point of contact for several states. You can see here, if you live in the state of South Carolina, the water quality standards staff in the EPA Region 4 Office would be your points of contact.

Some regional offices have authorized tribes located in their area, so they serve as the point of contact for those authorized tribes. So, if you live in the Pueblo of Acoma, an authorized tribe which is located in New Mexico, your point of contact for water quality standards at the EPA would be the staff in the Region 6 Office. Please see the EPA Regional water quality standards Coordinators list, and the EPA's website for contact info.

Now that you've had a glimpse of the different EPA Regions on the map, let's talk about what the Regions do as far as water quality standards. The EPA Regions provide technical assistance to states and authorized tribes, particularly on site specific and/or state and tribal specific matters. They serve as the primary contacts and technical assistance providers for states and authorized tribes in developing, refining, and implementing water quality standards; they review water quality standards packages from states and authorized tribes and write letters approving or disapproving new and revised state-adopted water quality standards. When the Regional Office encounters a standards submission that is not consistent with the CWA and water quality standards regulations, they coordinate with the EPA Headquarters when they are preparing a disapproval. They may review state or tribe-issued NPDES permits, and they issue NPDES Permits in states and authorized tribes where the program has not been authorized.

The water quality standards program at the EPA Headquarters, where Tom, Janita, and I work, doesn't get involved in the regular day-to-day interactions between states and the Regional Offices. We serve more of a coordination and oversight function. Informed by collaboration with the Regional Offices and with input from states, authorized tribes, stakeholder groups, and interested members of the public, we develop national regulations, national recommendations, guidance for implementation, and policy. We provide assistance to states and authorized tribes

on disapprovals and on approvals that raise significant issues. And, we help facilitate communication among the Regions, states and authorized tribes when necessary.

I am going to pass it off to Janita now, and she'll take you through the end of the webinar. I know this is a lot of material to absorb, and I hope you are continuing to be engaged. Please do stick with us for just a little longer, as we'll work to wrap things up for you, and we'll also look for some feedback from you on how this webinar worked for you and what suggestions you have for us for our future education efforts, how we can best serve you.

Janita Aguirre
Thanks, Heather, and thank you everyone for joining us today. Before you sign off, please listen to a few take-home messages as well as instructions for getting your certificate and filling out the evaluation form. The evaluation form will be very important to us as we consider future web presentations.

Before we get to that, we have a few more questions related to public involvement in the water quality standards program and TAS. One question we have received is: "Who should we contact if we want to get more involved in the WQS process?" Each state and tribe has slightly different processes for standards development. Your first contact for how to get involved in the process should be your state or tribe's water quality standards program, and a good place to get started would be the state or tribe's water quality standards website.

Another question that we often get is: **"**Where can I learn more about the TAS process?" You can find many resources at EPA.gov by searching "TAS." There are separate TAS processes for each regulatory program. There's actually an archived, two-hour webcast that discusses the TAS process for the water quality standards program, which you can find listed on your website list by following the link for the EPA CWA Webcasts.

The webcast focuses on what needs to be included in a TAS application, the EPA's internal process for reviewing TAS applications, and tips and suggestions related to the TAS process and the water quality standards program. In addition, a Tribal representative provides their experience with the TAS process. It can be found on the EPA's Tribal Portal under CWA Tribal Training. The link to the Tribal Portal can also be found on your website list.

There are a number of take home messages for everyone who has participated in today's web presentation. First, the CWA establishes a national 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," wherever attainable. Second, the CWA and the water quality standards regulations are the basis for the EPA's review and approval of adopted state and Tribal water quality standards. Third, states and authorized tribes have important and unique roles in developing, adopting, reviewing and revising water quality standards.

State and Tribal water quality standards establish water quality goals for a waterbody. These include designated uses, criteria, and antidegradation. The state and tribal water quality standards provide the regulatory basis for controls beyond technology-based limits in NPDES

permits. They are also used to determine attainment and non-attainment, for future TMDL, development. Lastly, you all can and should be involved in the water quality standards program.

Today we have presented a broad overview of the water quality standards program. For those of you who are new to water quality standards, I hope that we have provided exposure and insights into the tools that can be used to develop and implement successful water quality protection programs. For those of you who are veterans of the water quality standards program, I hope that today's discussion has reinforced some key concepts. The EPA stands ready to help you develop and implement water quality protection programs that are important to you and your way of life. Please use your website list to find more information about anything we covered today.
I want to thank today's presenters, Tom and Heather, for their presentations.

A web presentation feedback form should soon appear on your screen. Please take a few minutes to complete this form and give us feedback on today's session. We appreciate your feedback as we work to improve our web presentations and future educational opportunities. We also welcome your input on the types of water quality standards training you might require in the future.

When you have completed the survey, don't forget to download the certificate! Follow the link at the end of the evaluation. A certificate will not be mailed to you. If there are multiple people in the room with you, you can click on this link to customize your certificate and print a copy for everyone attending at your location.

For more information about upcoming classroom and web-based water quality standards trainings, please go to the Water Quality Standards Academy website. The website address appears on the slide here. You can also sign up for the water quality standards-list-server to receive information on announcements of future water quality standards Academy sessions.

Our estimates show that over 1,000 people have participated in today's web presentation. We hope that you have found this to be an informative and useful presentation. This concludes our web presentation. Thank you for joining us!