WQBELs Part I: Identifying Applicable Water Quality Standards

1. NPDES Permit Writers’ Course Online Training Curriculum

1.1 WQBELs Part I: Identifying Applicable Water Quality Standards

Notes:

Hello, and welcome to this presentation on water quality-based effluent limitations in National Pollutant Discharge Elimination System, or NPDES, permits.

This is one of four presentations on establishing water quality-based effluent limitations in an online training series on the NPDES program sponsored by the Environmental Protection Agency’s Water Permits Division.

This presentation addresses the topic of identifying the applicable water quality standards that are the basis for the water quality-based effluent limitations in an NPDES permit.

We should note here, that this presentation provides only a brief introduction to water quality standards, and focuses on the basic principles with which an NPDES permit writer should be familiar. Those interested in a more detailed overview of water quality standards may wish to visit EPA’s Water Quality Standards Academy Web site or attend the five-day Water Quality Standards Academy.

Before we get started with the presentation, I want to introduce our speakers and take care of a housekeeping item.

1.2 Presenters

Notes:

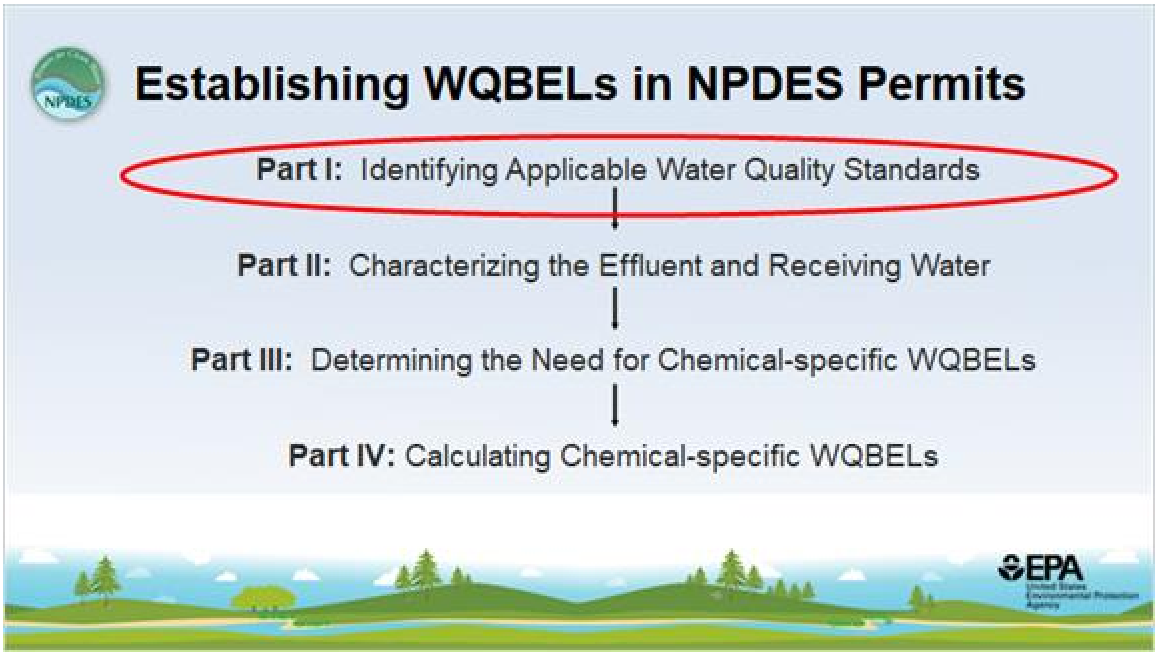
First the introductions.

Your speakers for this presentation are David Hair, an environmental engineer with the Water Permits Division of USEPA in Washington, DC, and me, Greg Currey, an environmental engineer with Tetra Tech, Incorporated in Fairfax, Virginia.

Now for that housekeeping item. I need to let you know that the materials used in this presentation have been reviewed by USEPA staff for technical accuracy; however, the views of the speakers are their own and do not necessarily reflect those of USEPA. NPDES permitting is governed by the existing requirements of the Clean Water Act and USEPA's NPDES implementing regulations. These statutory and regulatory provisions contain legally binding requirements. The information in this presentation is not binding. Furthermore, it supplements, and does not modify, existing USEPA policy, guidance, and training on NPDES permitting. USEPA may change the contents of this presentation in the future.

Now let's get started with the presentation.

1.3 Establishing WQBELs in NPDES Permits



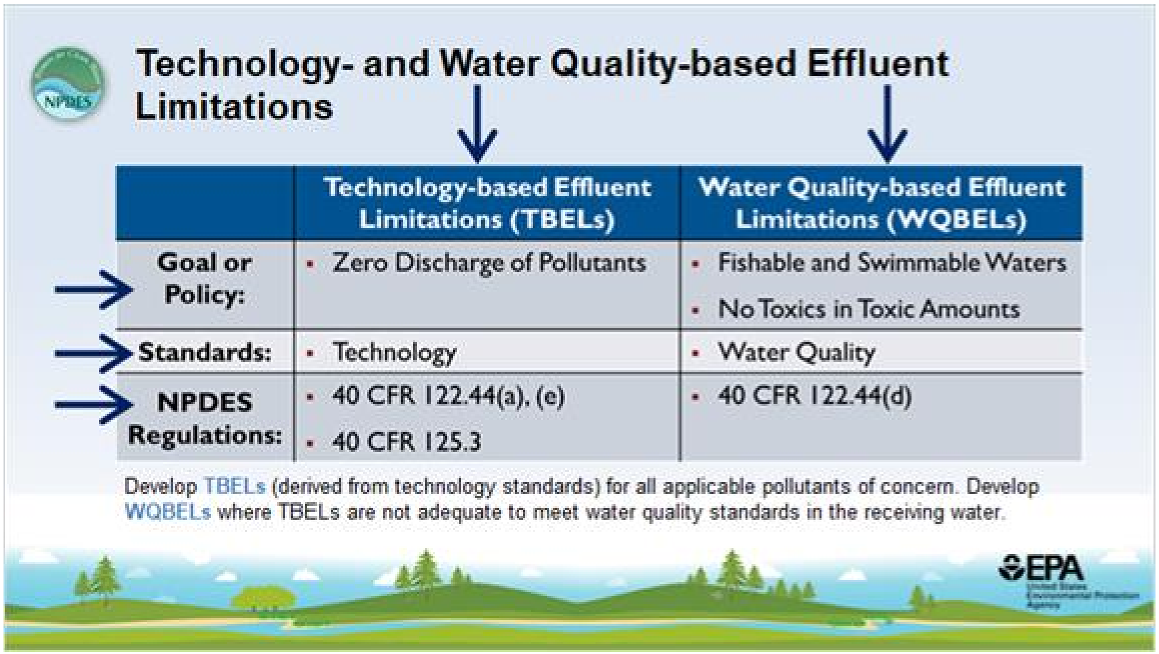
Notes:

We can break down the process for developing water quality-based effluent limitations into four major steps. These four steps will be the topics for this four-part series of presentations on establishing water quality-based effluent limitations in NPDES permits.

As I noted a few moments ago, this part, Part I, will focus on identifying the applicable water quality standards. Parts II through IV are concerned with how we implement those standards through effluent limitations.

You can find all of the presentations in this series on the "Training and Meetings" page of USEPA's NPDES Web site.

1.4 Technology- and Water Quality-based Effluent Limitations



Notes:

In a previous presentation in this series, we listed several goals and policies found in Section 101(a) of the Clean Water Act, three of which are provided in the top row of the table on this slide.

The left side of the table outlines what we refer to as the "technology-based" approach to establishing effluent limits.

The Clean Water Act goal that drives this approach is that "the discharge of pollutants into navigable waters be eliminated by 1985." To move us toward this goal, Congress, in the Clean Water Act, established required levels of performance for various types of point sources, and established deadlines by which these standards had to be enforced. To learn more about how these standards are implemented through NPDES permits, you can view the presentations on technology-based effluent limitations that are part of this training series.

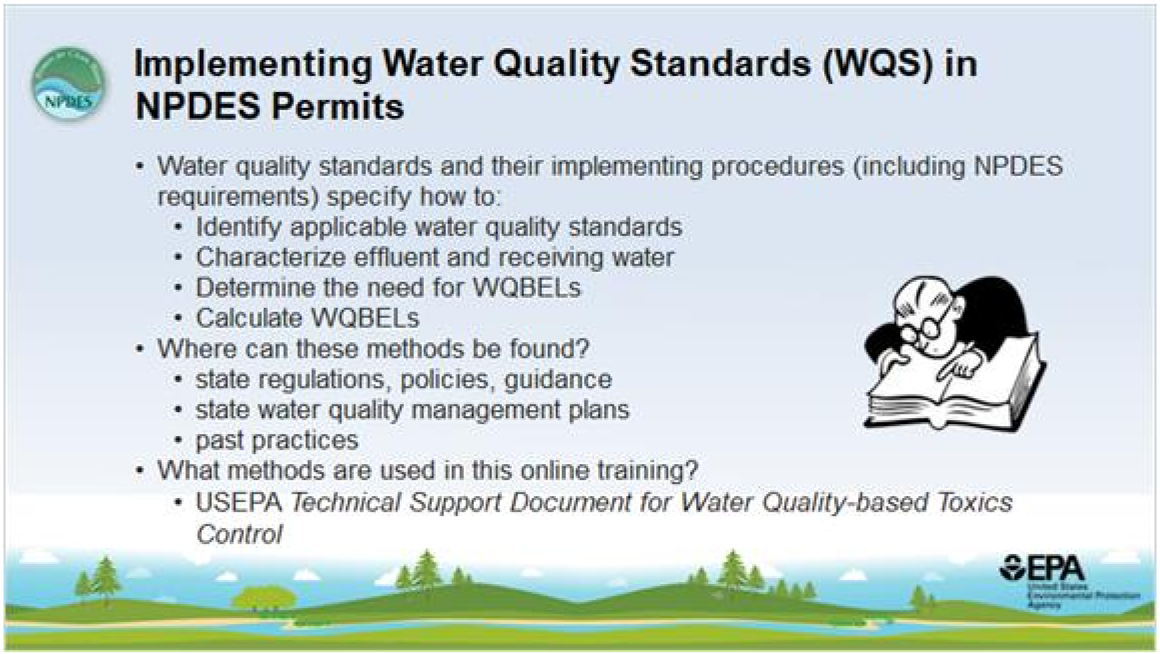
The other approach to developing effluent limits in permits is driven by the Clean Water Act goal and policy listed in the top right of the table; namely, that we attain water quality that supports fish, shellfish, and wildlife propagation and recreation in and on the water, and that the discharge of toxic pollutants in toxic amounts be prohibited.

This "water quality-based" approach to pollution control, relies on states, territories, and tribes to establish water quality standards to protect their waters.

The NPDES regulations then establish a requirement to develop "water quality-based effluent limitations" or "WQBELs" if technology-based effluent limits will not assure attainment of these water quality standards.

Because the Clean Water Act and the NPDES regulations establish these as two independent approaches for developing effluent limitations in an NPDES permit, a permit writer must consider limitations based on both.

1.5 Implementing Water Quality Standards (WQS) in NPDES Permits



Notes:

In order to develop WQBELs, we need procedures to:

- identify the applicable water quality standards,
- characterize the effluent and receiving water,
- determine the need for WQBELs, and then
- develop WQBELs from the applicable water quality criteria.

These four steps outline the content of our online training series presentations on water quality-based effluent limitations.

Generally, procedures for implementing water quality standards are found somewhere in a state's program regulations, policies, or guidance-typically associated with either the water quality standards program or the NPDES permitting program.

The important thing for each permit writer to know is where the process is specified in your state or EPA Region.

Sometimes, particularly for unusual situations, the procedures might not be written anywhere.

Hopefully, this won't happen too often, but if it does, you might need to check past practice in your office or come up with a process for the very first time. In these instances, the permit writer should check with and consult more experienced water quality or permitting specialists in the state or EPA Regional office.

EPA developed national water quality permitting guidance for control of toxic pollutants back in 1991. The Technical Support Document for Water Quality-based Toxics Control (or the TSD for short) provides detailed procedures for predicting water quality effects from point source discharges and for calculating water quality-based NPDES permit limits. It can be applied to toxic pollutants and to other pollutants that require limits with similar averaging periods.

In this online training, the procedures we use are based on the TSD guidance in areas where the TSD makes specific recommendations. Many states have developed their own procedures, but most rely on the basic approach established in the TSD, generally with a few modifications.

OK, let's get started looking at how we go about identifying the water quality standards that we need to implement in a permit.

1.6 Water Quality Standards: Clean Water Act Requirements

Notes:

This slide lays out the statutory underpinnings of the water quality standards-to-permits process.

In other modules in the NPDES online training series, we looked at the objective of the Clean Water Act: Restore and maintain the chemical, physical, and biological integrity of the Nation's waters

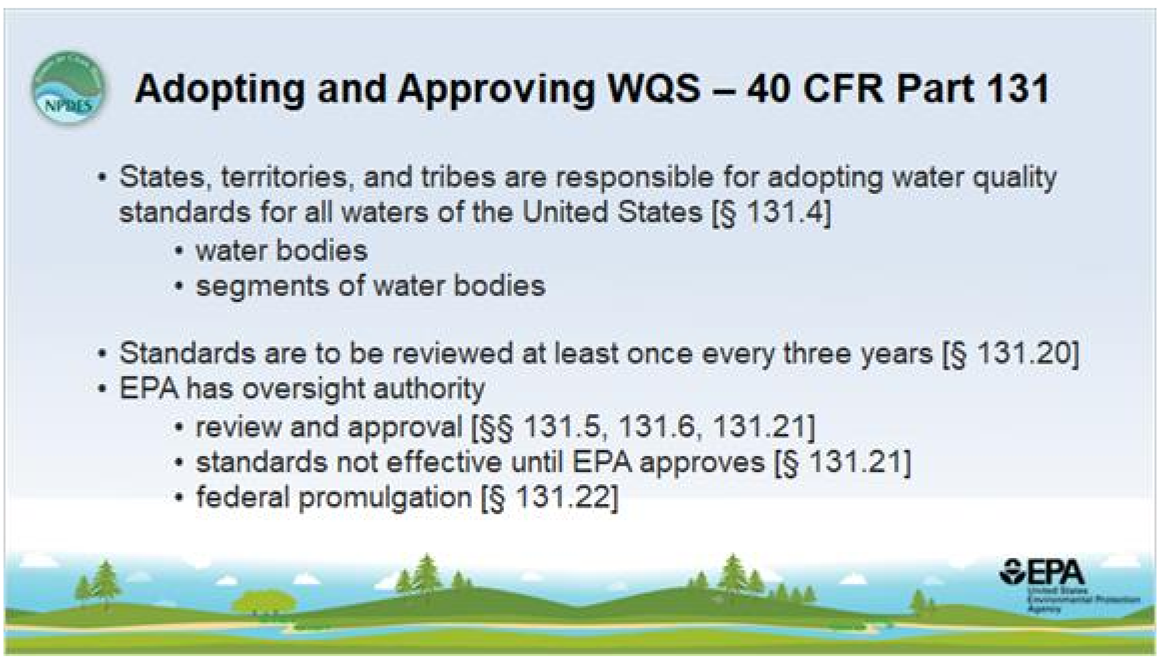
As we saw on an earlier slide, two of the goals in Section 101(a) that come under that objective are to eliminate discharges of pollutants into navigable waters and, as an interim goal, wherever attainable, achieving a level of water quality that would protect fish, shellfish and wildlife and provide for recreation in and on the water, which we call the "fishable/swimmable" goal. There also is the "no toxics in toxic amounts" policy. The fishable swimmable goal and the toxics policy are the basis for the water quality standards program and the effluent limitations derived from those water quality standards.

Section 303(c) establishes the statutory framework and requirements for the water quality standards program and requires that states establish water quality standards.

Section 304(a) requires EPA to develop and publish water quality criteria recommendations that states can use in their water quality standards.

Finally, section 301(b)(1)(C) requires effluent limits in NPDES permits that will assure compliance with water quality standards. We refer to these limits based on section 301(b)(1)(C) as water quality-based effluent limitations.

1.7 Adopting and Approving WQS – 40 CFR Part 131



Notes:

The regulatory framework of the national water quality standards program is established in the federal regulations at 40 CFR Part 131. This Part describes the requirements and procedures for developing, reviewing, revising, and approving water quality standards as authorized by Section 303(c) of the Clean Water Act.

Water quality standards are a matter of state, territorial, or tribal law or regulation, and these governments are responsible for establishing standards for all waters of the United States within their jurisdiction. We'll just use the term "state" from here on out, but remember that this term also includes territories and certain tribes.

It is the state's responsibility to determine how its waters are identified and named, and the state can choose to segment or subdivide the waterbodies and may apply different standards to different segments of the same waterbody.

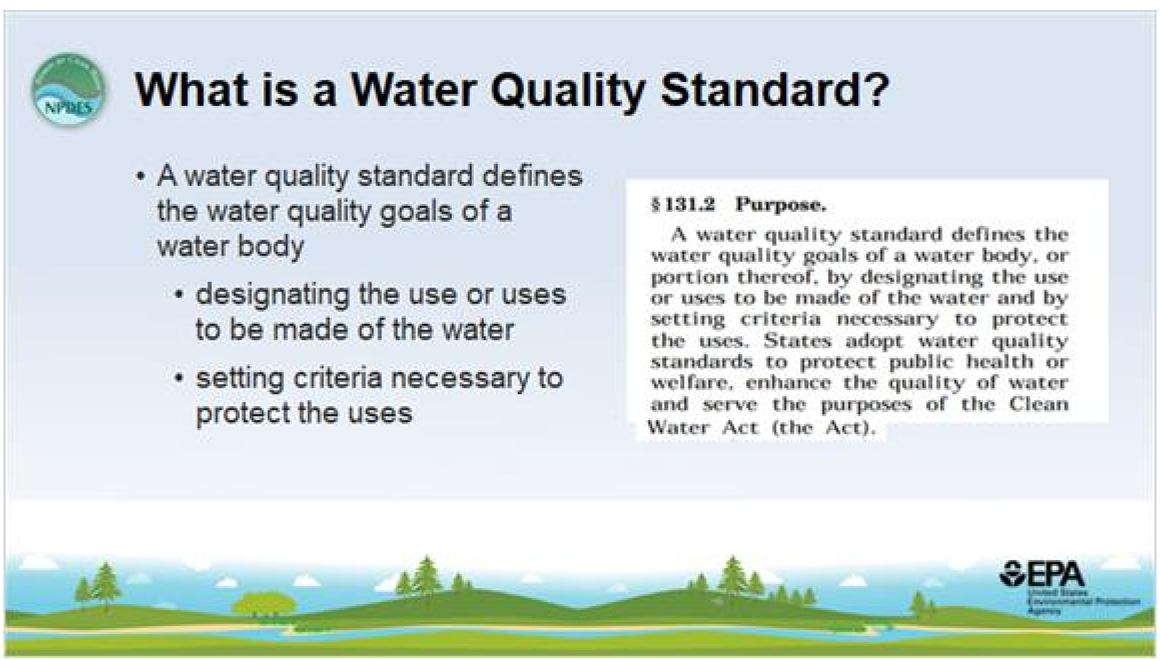
Once a state has established its water quality standards, the regulations require the state to conduct at least a triennial review of these standards to ensure that they remain appropriate and protective. This review process requires an opportunity for public participation, including a public hearing.

If a state adopts a new or revised standard, EPA has the authority and responsibility to review and approve the standard. It is also important to know that state standards become effective for Clean Water Act purposes only after EPA approval. Why is this relevant to permit writers? Well, you need to check to make sure you're using the approved water quality standards.

Another part of EPA's oversight role is that it can promulgate federal standards for a state if and when that state fails to adopt appropriate standards on its own. Examples of this "over-promulgation" process are the 1992 National Toxics Rule and the 2000 California Toxics Rule.

Dave, can you tell us what exactly is a water quality standard?

1.8 What is a Water Quality Standard?



Notes:

Sure, Greg.

40 CFR 131.2 provides the regulatory definition, and states that a water quality standard defines the water quality goals of a water body, or a portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect those uses.

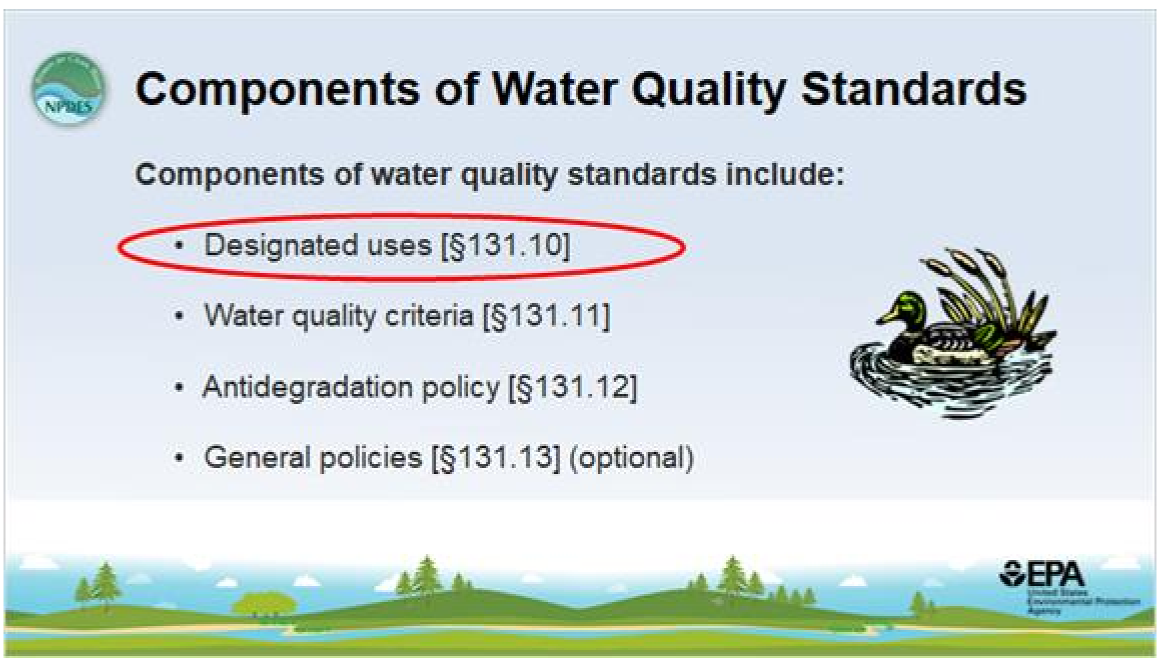
An important point to note here is that a water quality standard applies to the water body, not to the discharge.

From the perspective of permit writers, that means that we will need to determine how we take those standards that apply to the water body, and derive effluent limitations that apply to a point source discharge.

Two other important elements in the definition are the "designation of a use or uses" and "setting criteria necessary to protect the uses."

In the next few slides we'll take a closer look at these elements of a water quality standard.

1.9 Components of Water Quality Standards



Notes:

As noted in the definition, a water quality standard is made up of "designated uses" and "criteria" to protect those uses. In addition, when a state develops its water quality standards it must also develop an "antidegradation policy." A state may also develop "general policies" that cover water quality standards implementation practices; however, the general policy component is not required.

Thus, we often say that there are three required components of water quality standards: designated uses, criteria to protect those uses, and an antidegradation policy. Now let's take a closer look at these components, beginning with "designated uses."

1.10 Designated Uses – § 131.10

Notes:

It is the states', tribes', and territories' responsibility to designate intended uses for each water body or segment of a water body within their jurisdiction. You might think of this process as a group of very knowledgeable state officials sitting around a table with a map of each watershed in the state, and assigning a set of uses to each "blue line" on the map, and then consulting with the public on these decisions. These use designations establish the goal of the water body whether or not that use is currently present or achieved. What are the appropriate designated uses?

Well, first, let's remember the goal of Section 101(a)(2) of the Clean Water Act, that is "...water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and provides for recreation in and on the water..." We often refer to these as the "fishable/swimmable" uses.

Therefore, the "baseline" designated uses for all waters of the United States will include "aquatic life protection" and "recreation" unless the state provides a demonstration that these uses cannot be attained.

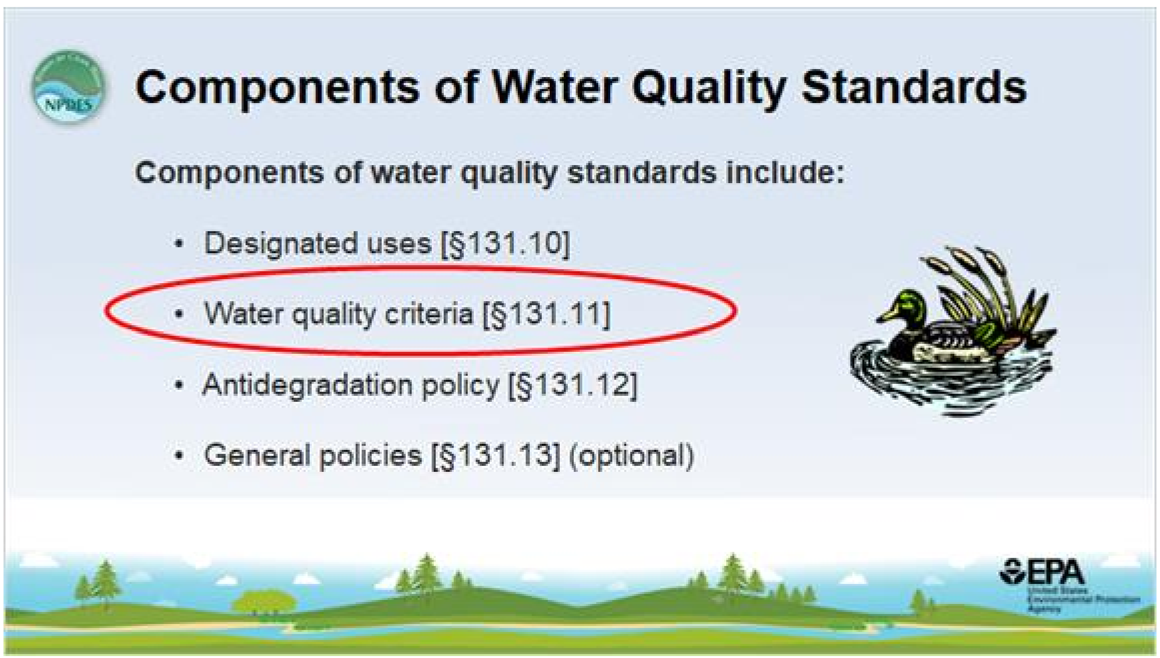
States frequently refine these fishable/swimmable uses into subcategories such as: warm water and cold water fisheries for the protection of aquatic life and “primary contact” (typically swimming or wading) and “secondary contact” (perhaps boating and fishing) for recreation.

Other use categories that states may assign include “public water supply” (for drinking water sources); agricultural water supply (for crop irrigation or livestock watering); and industrial water supply.

OK. Once a state has assigned a set of uses to each water body, how can we tell if the water is clean enough to achieve these uses?

Greg?

1.11 Components of Water Quality Standards



Notes:

Well, Dave, that’s the purpose of the second part of the standard, the “water quality criteria”, which are addressed in EPA’s regulations at 40 CFR 131.11.

1.12 EPA Water Quality Criteria

Notes:

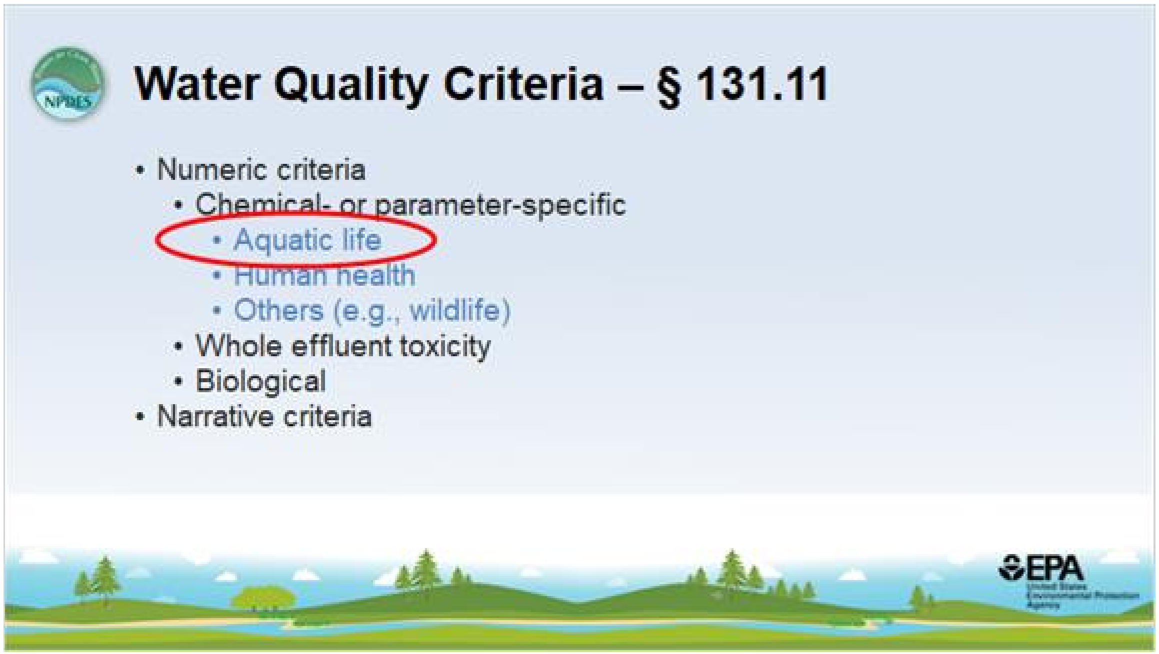
Earlier we noted that Clean Water Act section 304(a) requires EPA to publish guidance and procedures for developing water quality criteria.

EPA, and its predecessor agency, would periodically publish books that included a summary of its latest recommended water quality criteria and how the criteria were developed.

As you can see, starting with the "Green Book" in 1968, these books were published every few years through 1986.

EPA's Office of Science and Technology now publishes all of the current EPA-recommended criteria on the Office of Science and Technology Web site, which is referenced on this slide.

1.13 Water Quality Criteria – § 131.11



Notes:

There are several ways that we can categorize water quality criteria.

The first distinction we'll make is between numeric and narrative criteria.

Let's think about the differences between these two types of criteria.

Numeric criteria address specific concentrations of pollutants or, for whole effluent toxicity criteria, quantified measurements of the toxic effects of a mixture of pollutants, or, for biological criteria, a quantified measurement of the health of a water body.

Narrative criteria, on the other hand, are statements about the desired water quality of the water body to which they apply.

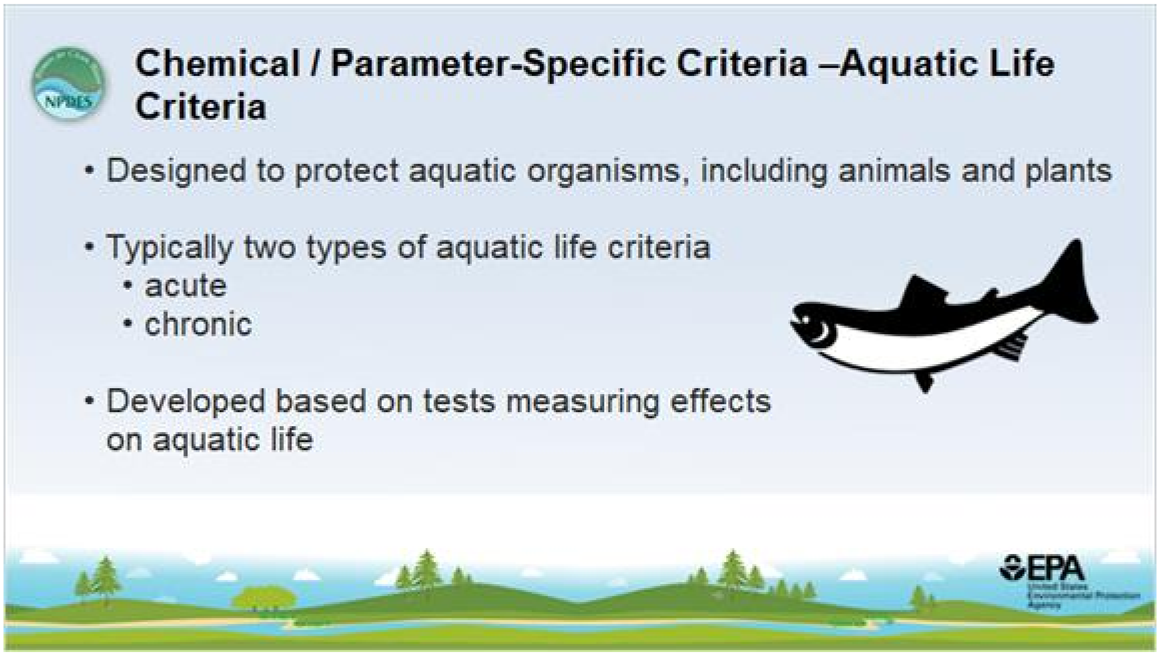
We'll start our discussion of criteria by focusing on numeric criteria, which, as we just noted, we can further divide into other categories.

- So, first, we'll discuss chemical- or parameter-specific criteria.
- Second, we'll talk about whole effluent toxicity (or WET) criteria.
- And finally, we'll discuss biological criteria.

In each case, we'll look at how these criteria would be used in the NPDES program and some of the things a permit writer needs to think about when implementing the criteria.

So, let's start with a closer look at one type of chemical- or parameter-specific criteria-criteria for the protection of aquatic life.

1.14 Chemical / Parameter-Specific Criteria –Aquatic Life Criteria



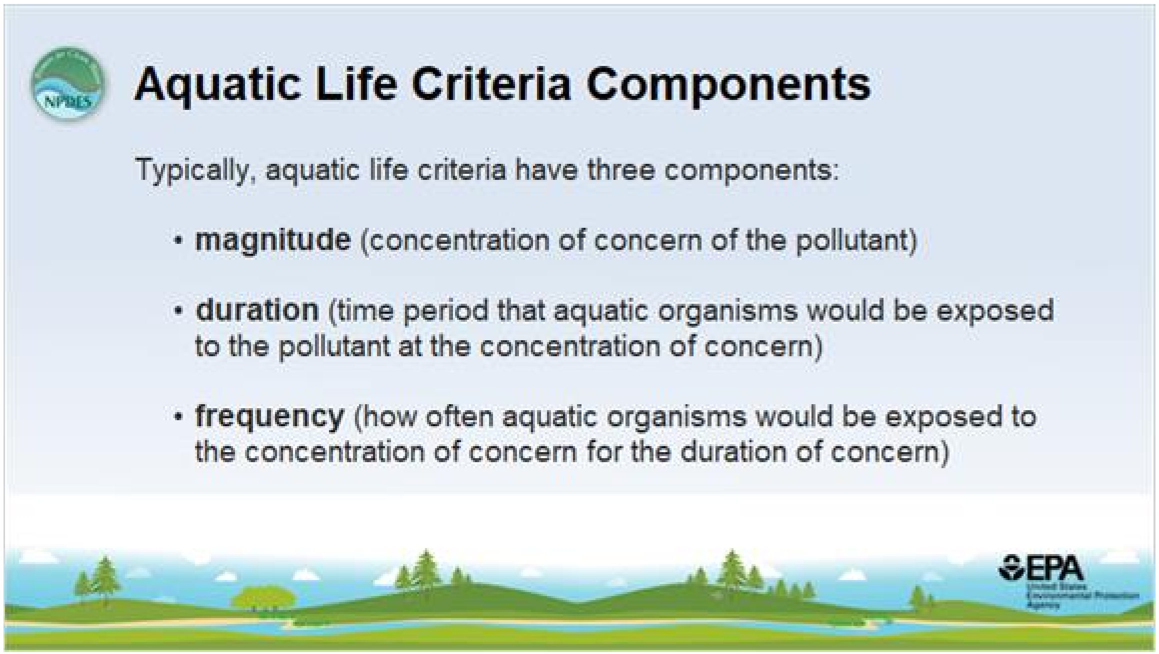
Notes:

Aquatic life criteria are developed to protect all kinds of aquatic organisms, including both animals and plants, from unacceptable impacts of pollutants.

Typically, there are two types of aquatic life criteria applied in the water column:

- Acute criteria are developed to prevent lethality to aquatic life.
- Chronic criteria generally are developed to prevent sub-lethal effects on aquatic life, such as impacts on growth of the organisms or on reproduction.

1.15 Aquatic Life Criteria Components



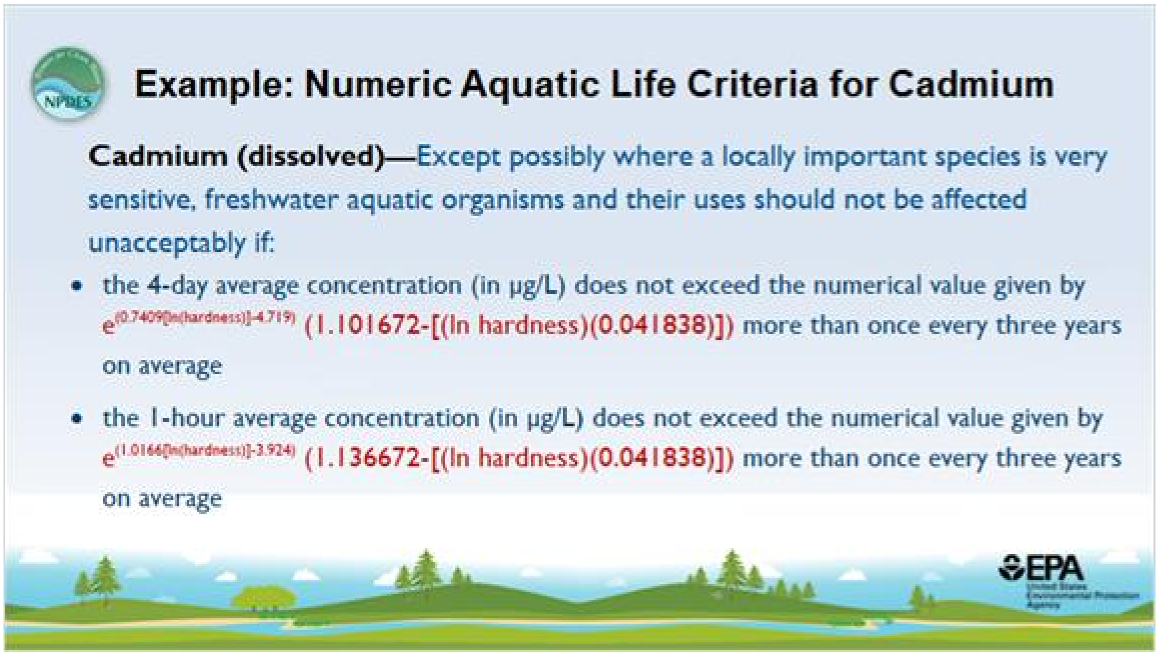
Notes:

It is very important to recognize that aquatic life criteria are not expressed as simply a concentration value.

Typically, they include three components:

- magnitude, which is the pollutant concentration or a restriction on how much of the pollutant can be present
- duration, which is the time period of exposure of aquatic organisms to the pollutant; and
- frequency, which is how often the aquatic organisms are exposed to the concentration of concern at the specified duration.

1.16 Example: Numeric Aquatic Life Criteria for Cadmium



Notes:

Let's look at an example of actual numeric aquatic life criteria that include magnitude, duration, and frequency components.

Here are EPA's acute and chronic aquatic life criteria recommendations for cadmium.

Notice the three components. The formula in red gives us the magnitude. The duration components are a 4-day average and a 1-hour average. The frequency is an excursion no more than once in three years on average.

Why is understanding these three components important for permit writers?

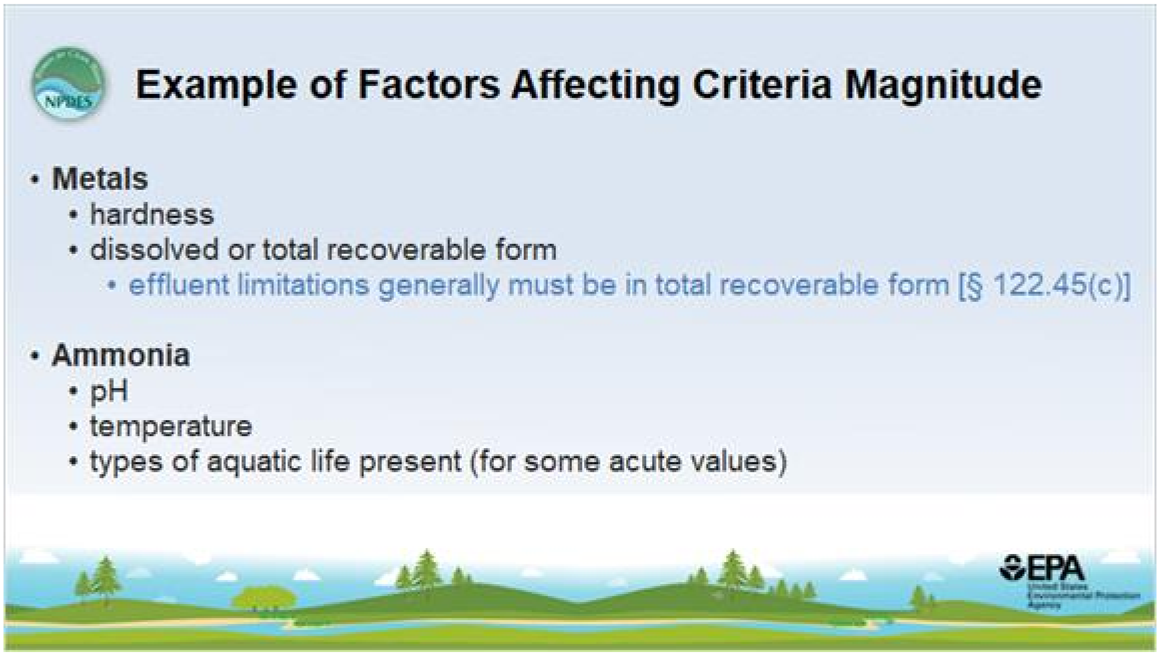
Since the criteria have duration and frequency components, as well as a magnitude, we have to find a way to reflect those components in our water quality-based effluent limits.

Notice other concerns for permit writers with respect to the cadmium criteria:

- The criteria are hardness-dependent, so how do we determine appropriate hardness for the receiving water?
- What do we do if there are locally important species?
- How would we implement a one-hour criterion with daily monitoring of effluent?

These are all issues that we need to address through implementation policies and procedures either in the water quality standards or NPDES permitting programs.

1.17 Example of Factors Affecting Criteria Magnitude



Notes:

You should be aware, as we just saw in the previous slide, that some of EPA's recommended aquatic life criteria are dependent on other environmental factors.

Like cadmium, the magnitude of most metals criteria is expressed as a formula that is dependent on the hardness of the receiving water. In addition, note that metals criteria can be expressed in either dissolved or total recoverable form, while effluent limitations are generally expressed only in the total recoverable form.

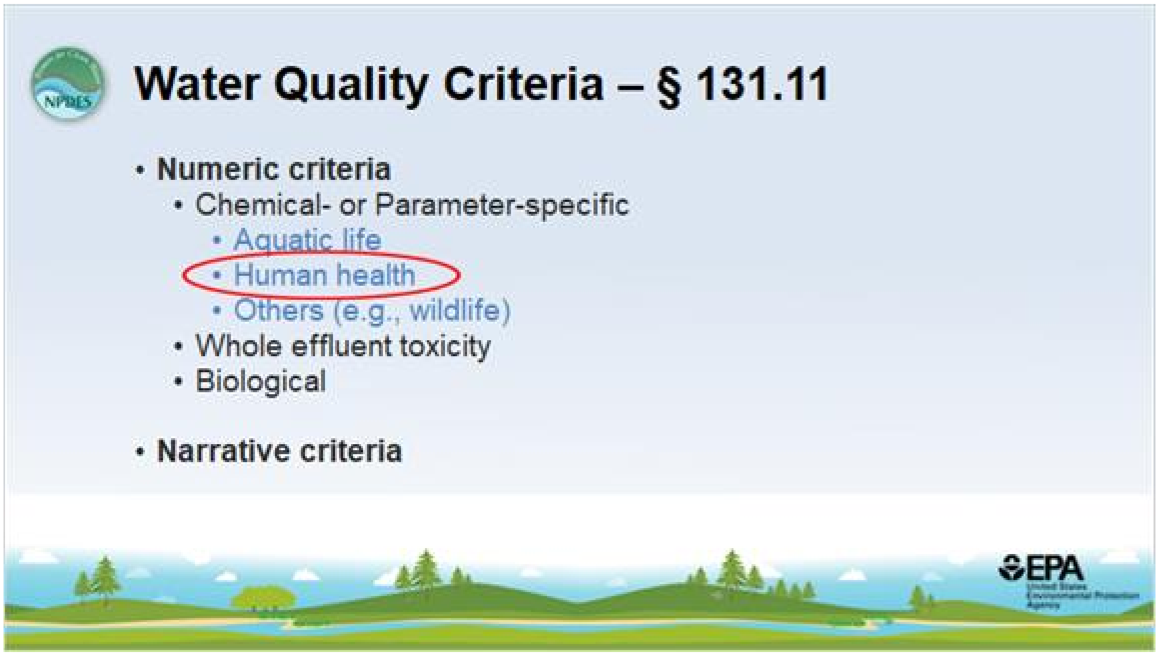
Another example is ammonia. Each aquatic life criterion for ammonia is expressed as a formula as well. The formulas for the criteria depend on the pH and temperature of the receiving water and, at some temperatures, the acute criterion also depends on the presence or absence of certain types of aquatic life.

So, as you can see, knowing how to apply the appropriate aquatic life criteria to a given permitting situation can be more complex than simply picking a single number off a chart. You often need to know something about the site-specific conditions in the receiving water to understand the criteria that apply in that receiving water.

Now, let's look at some other types of criteria.

Dave?

1.18 Water Quality Criteria – § 131.11

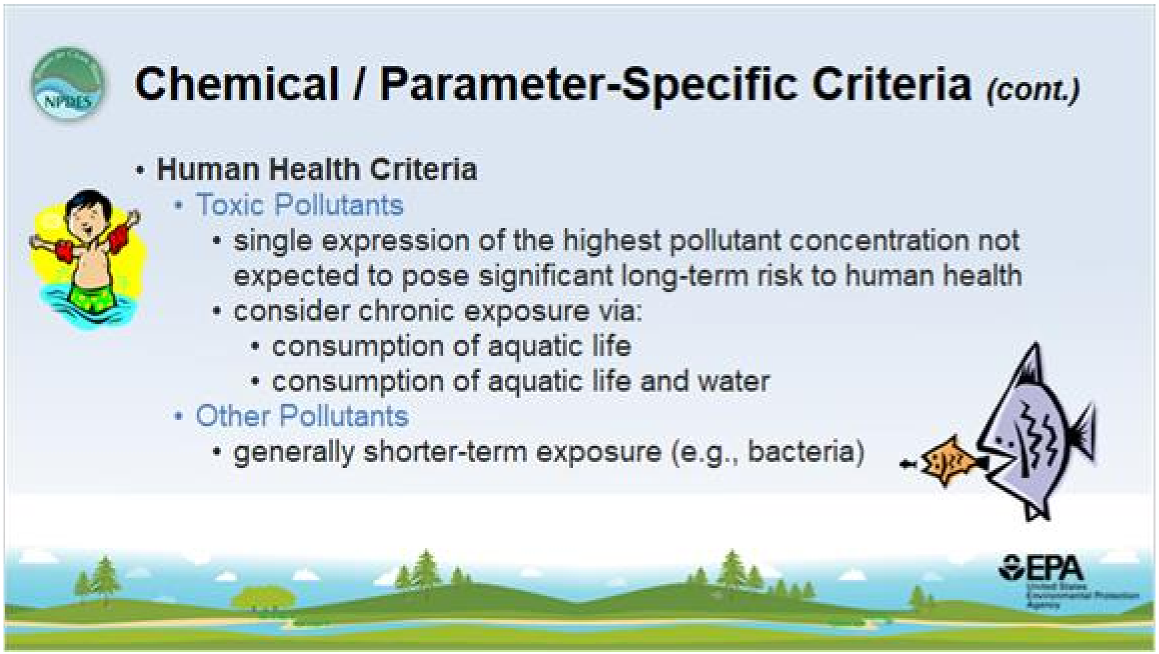


Notes:

OK, Greg. The next item on the list is numeric criteria for protection of human health.

The types of designated uses that we're trying to protect with these human health criteria include uses such as "recreation in and on the water" and "public water supply." In other words, depending on the particular use, we want the water clean enough so that fish and shellfish that we harvest are safe to eat, and water that won't make us sick if we swallow a little when we're swimming. In addition, if the water is designated as a public water supply, we do not want contaminants present that could make our finished drinking water unsafe.

1.19 Chemical / Parameter-Specific Criteria (cont.)



Notes:

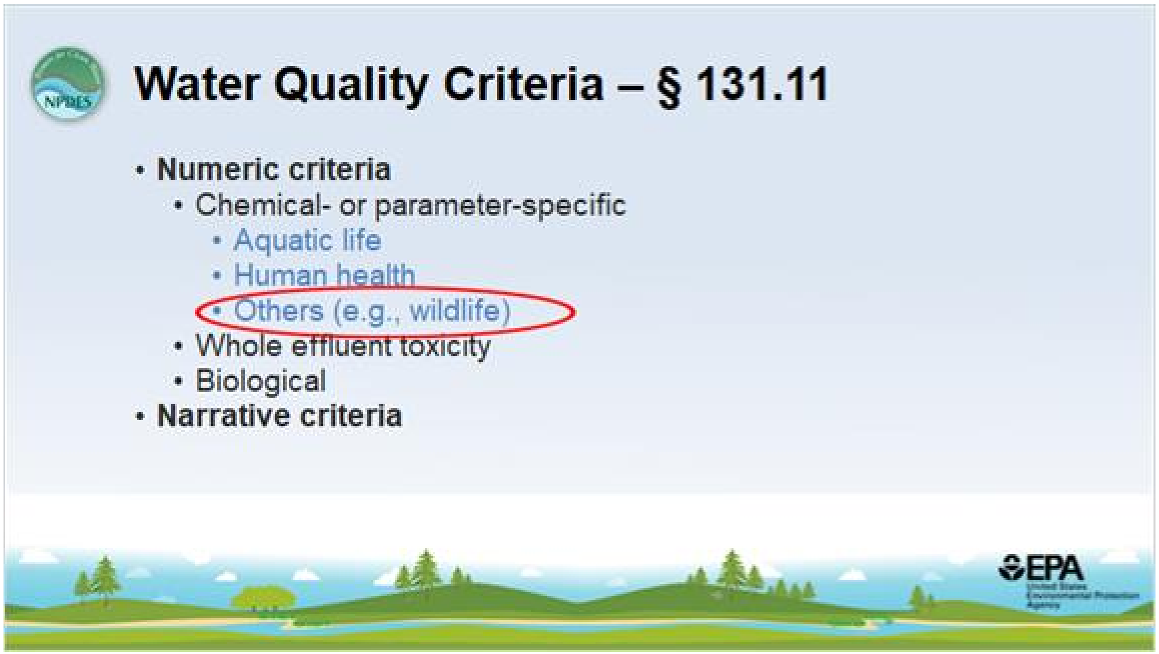
With those uses in mind, there are several types of pollutants that we might be concerned with when considering protection of human health.

For toxic pollutants, the criteria generally consider long-term human exposure via consumption of fish and shellfish, or, where the water is used as a drinking water supply, the consumption of fish, shellfish, and water.

Since the human health criteria for toxics account for the pathways through which people might be exposed to the pollutant, the magnitude of the criteria generally account for long-term exposures, and will vary depending on the use designations of the waterbody. In other words, the criteria will generally be more restrictive if the water is used for both fishing and drinking and less restrictive if the water is used solely for fishing. The toxics criteria also account for bioconcentration in the aquatic life and bioaccumulation up the food chain.

For pollutants such as bacteria, the effect we're concerned with is incidence of illness or infection, and the route of exposure is typically incidental ingestion while swimming. Therefore bacteria criteria are threshold values established for much shorter exposure periods.

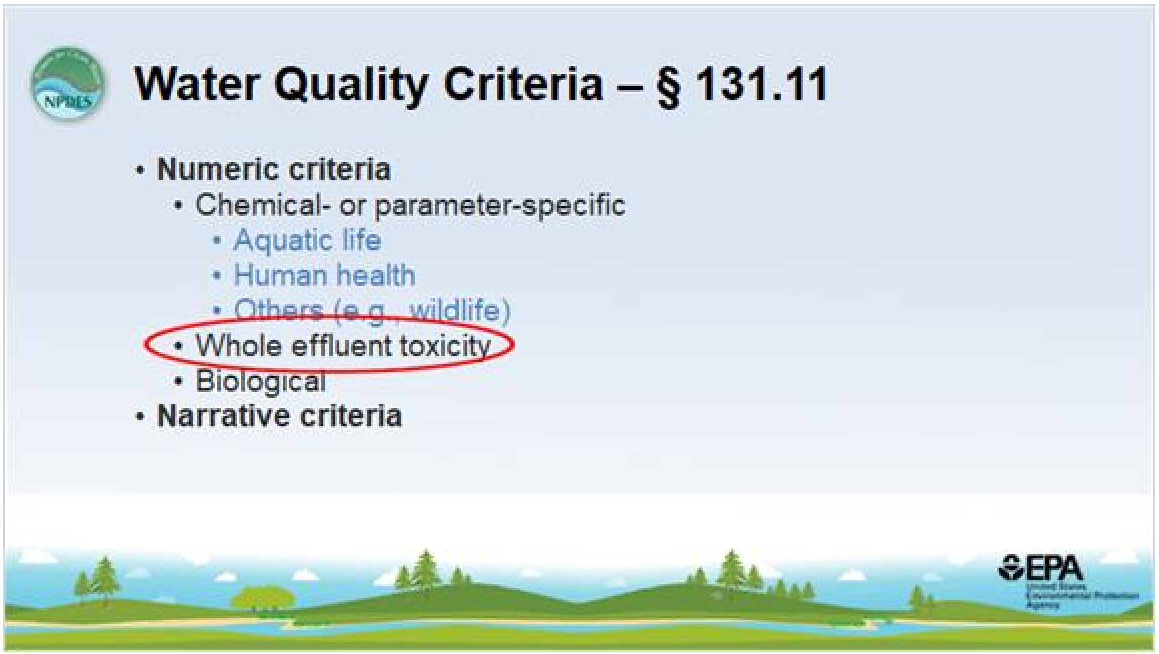
1.20 Water Quality Criteria – § 131.11



Notes:

The "Other" category on our list is basically a catch-all for chemical-specific criteria that are not aquatic life or human health criteria. For example, EPA developed criteria specifically for wildlife protection for the Great Lakes.

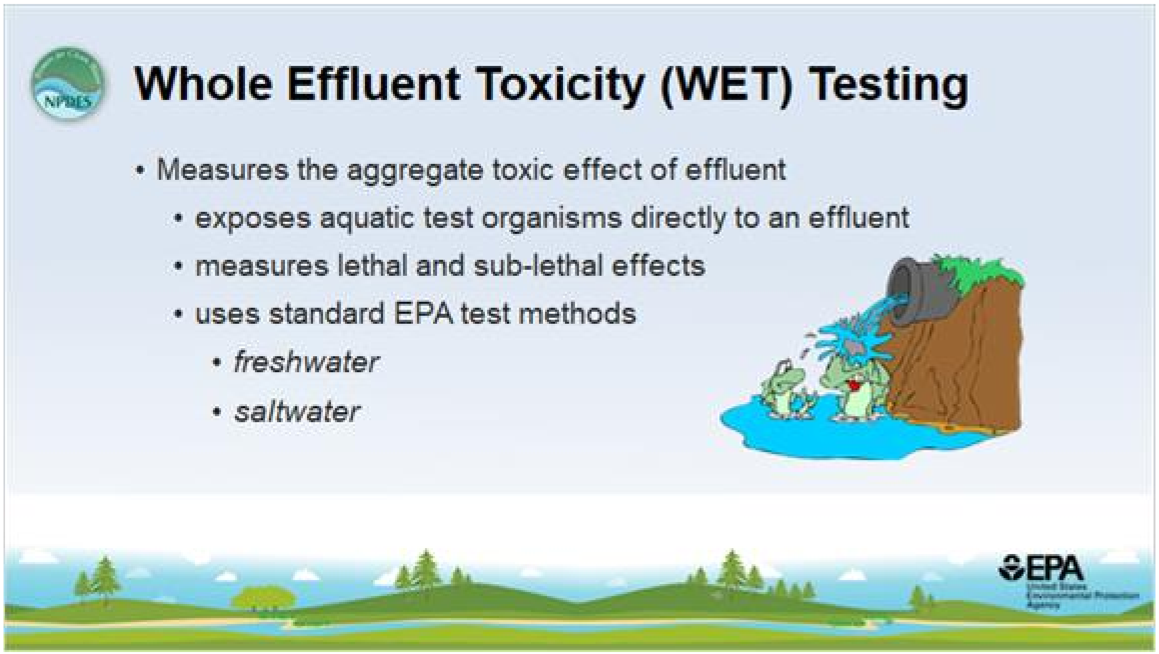
1.21 Water Quality Criteria – § 131.11



Notes:

OK, we've briefly covered numeric criteria for specific chemicals or parameters, now let's look at a unique type of criteria that assesses the effects of a mixture of pollutants-whole effluent toxicity.

1.22 Whole Effluent Toxicity (WET) Testing



Notes:

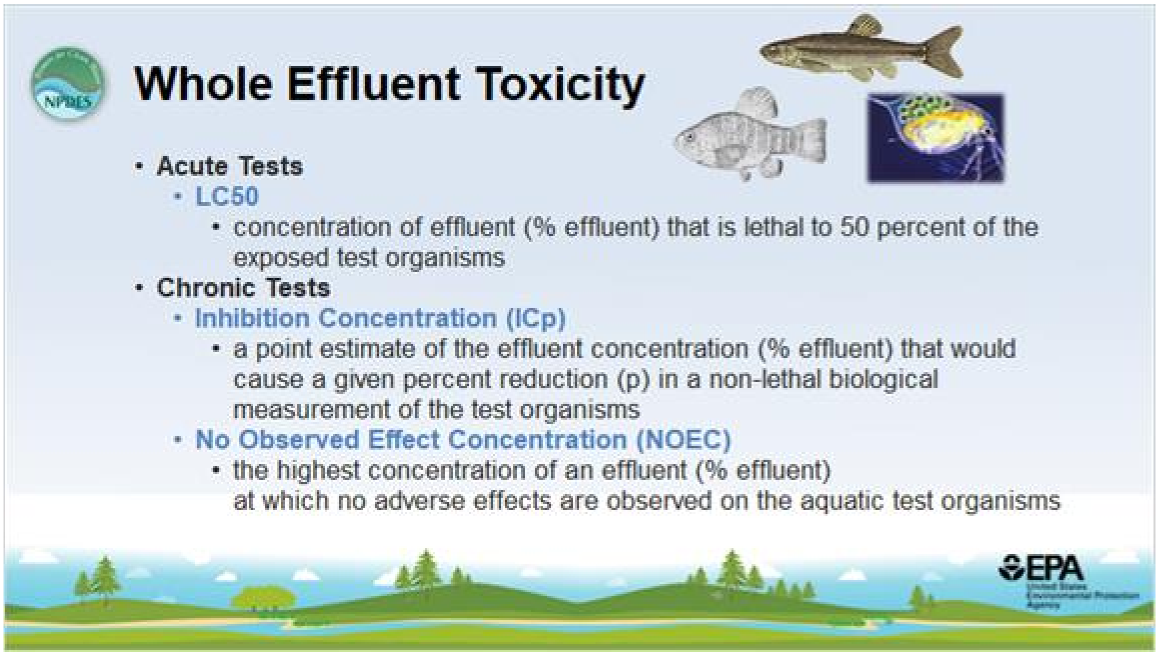
What is "whole effluent toxicity" or WET? Well, to understand what it is, let's first think about some of the potential shortcomings of only having chemical-specific criteria.

For one, chemical-specific criteria establish threshold values for exposure to a single pollutant. In most municipal and industrial effluents, there are dozens or perhaps hundreds of pollutants present. Chemical-specific criteria alone just can't measure or predict the combined effect of multiple pollutants.

Second, there might be pollutants present in an effluent for which criteria have not been developed. There are thousands of new chemical compounds produced every year, and we'll never have numeric criteria for each and every one of those chemicals.

WET allows you to address these shortcomings by measuring the aggregate toxic effect of an effluent on aquatic life.

1.23 Whole Effluent Toxicity



Notes:

As with chemical-specific criteria, whole effluent toxicity assesses both acute and chronic effects.

Acute toxicity tests expose aquatic organisms directly to effluent using a standard test method and then express the results as a specified endpoint of the test.

An example is an acute toxicity test on fathead minnows that exposes the organisms to the effluent for 96 hours and measures how many of the minnows have survived at the conclusion of the test.

Results of acute toxicity tests typically are reported as LC50 values. The LC50 is the concentration of effluent that is lethal to 50 percent of the exposed test organisms.

Chronic toxicity tests also expose aquatic organisms to effluent using a standard test method. An example is the 3-day water flea survival and reproduction test. We call these chronic whole effluent toxicity tests “short-term chronic tests” because, rather than looking at an entire life cycle, they consider a critical life stage of the organism. Typically we are concerned with sub-lethal effects in chronic toxicity tests (for example growth or reproduction), though they might also consider lethality.

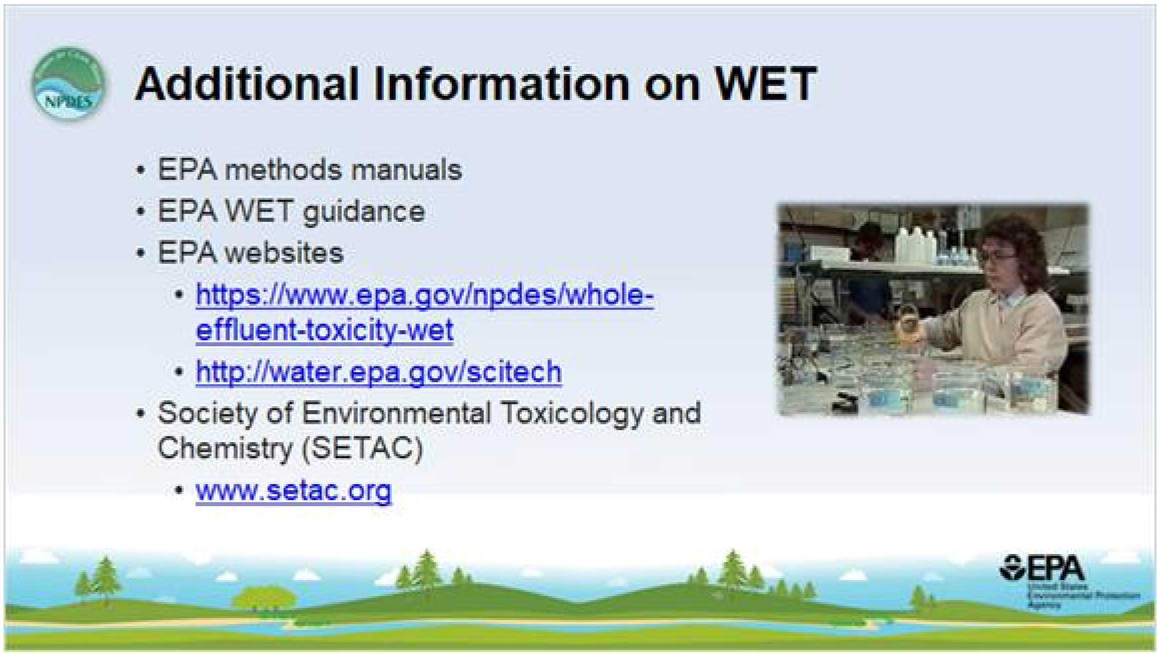
This slide provides two common statistical endpoints for chronic toxicity tests.

The Inhibition Concentration, or ICp, is a statistical value derived from test results (like the LC50), but considers non-lethal endpoints. It allows us to estimate the percent effluent that will cause a given percent reduction in a non-lethal biological measurement. For example, an IC25 would be defined as the percent effluent that causes a 25%

reduction in whatever biological endpoint we are measuring, for example, reproduction or growth.

The other chronic toxicity end-point shown here is the No Observed Effect Concentration, or NOEC. The NOEC is the highest concentration of an effluent at which no adverse effects are observed on the test organisms.

1.24 Additional Information on WET



Notes:

There are several places to find much more detailed information on WET.

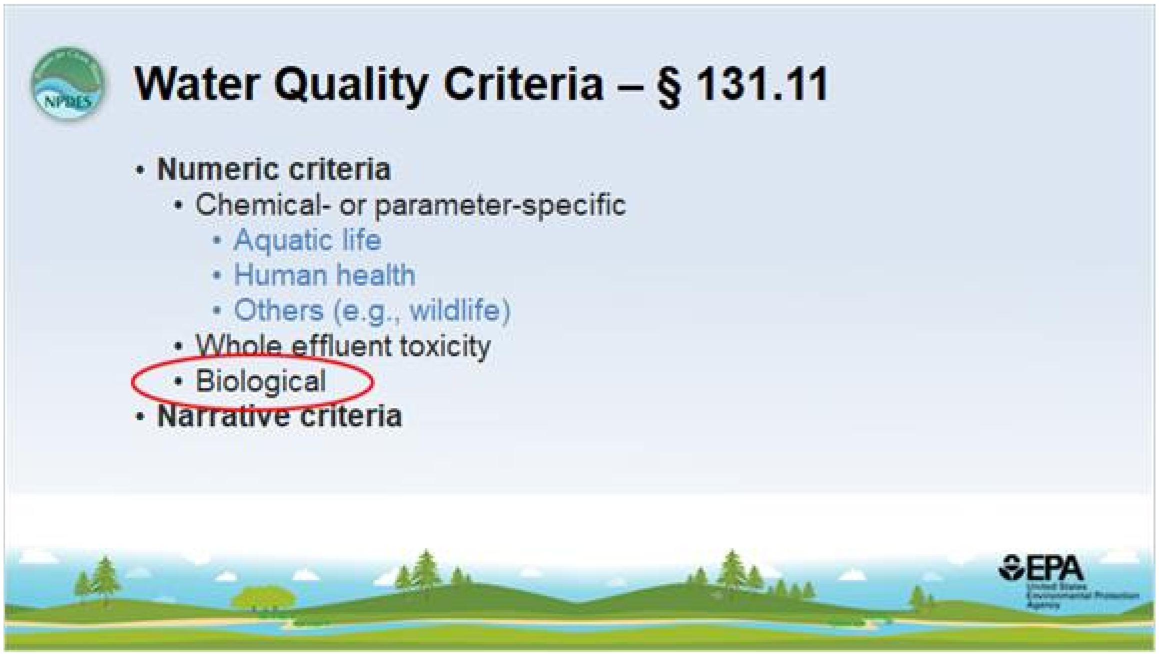
The EPA methods are described in published methods manuals, which are referenced in 40 CFR Part 136.

EPA has developed guidance on WET, which you can find, along with other helpful information, on EPA's NPDES and Science and Technology web sites.

EPA also has developed a series of DVDs, available through our web site, to demonstrate implementation of the WET test methods.

Finally, the Society of Environmental Toxicology and Chemistry (SETAC) has some helpful information and conducts periodic meetings, workshops, and conferences. You can visit their web site to see what they have planned.

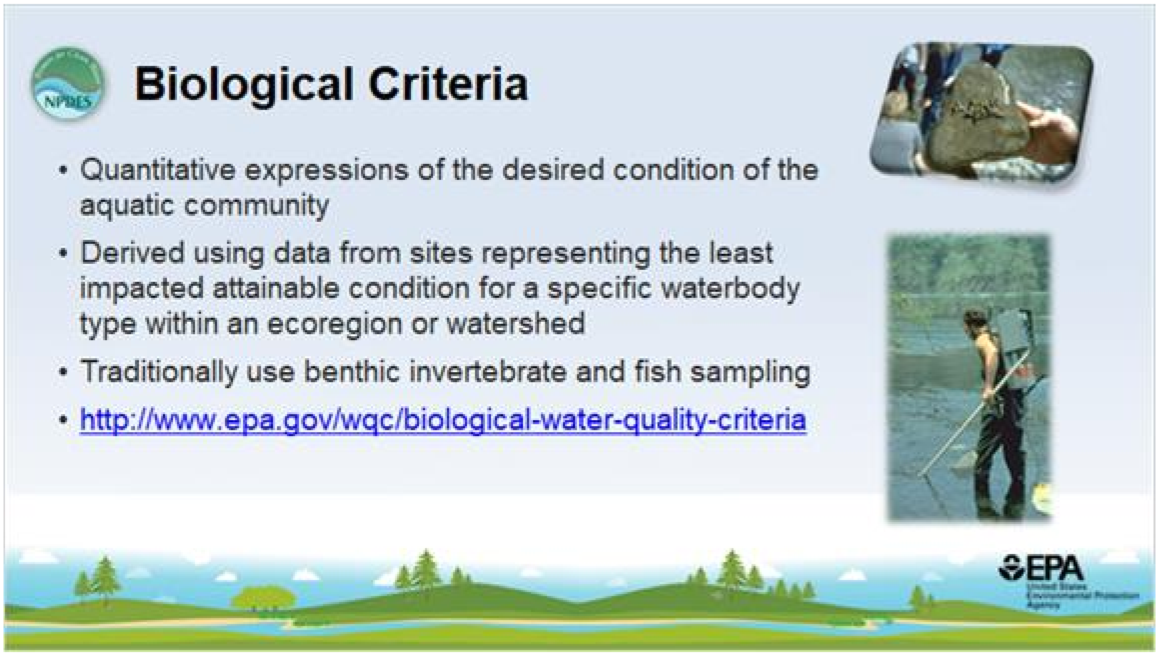
1.25 Water Quality Criteria – § 131.11



Notes:

The final type of numeric criteria that we will discuss is biological criteria.

1.26 Biological Criteria



Notes:

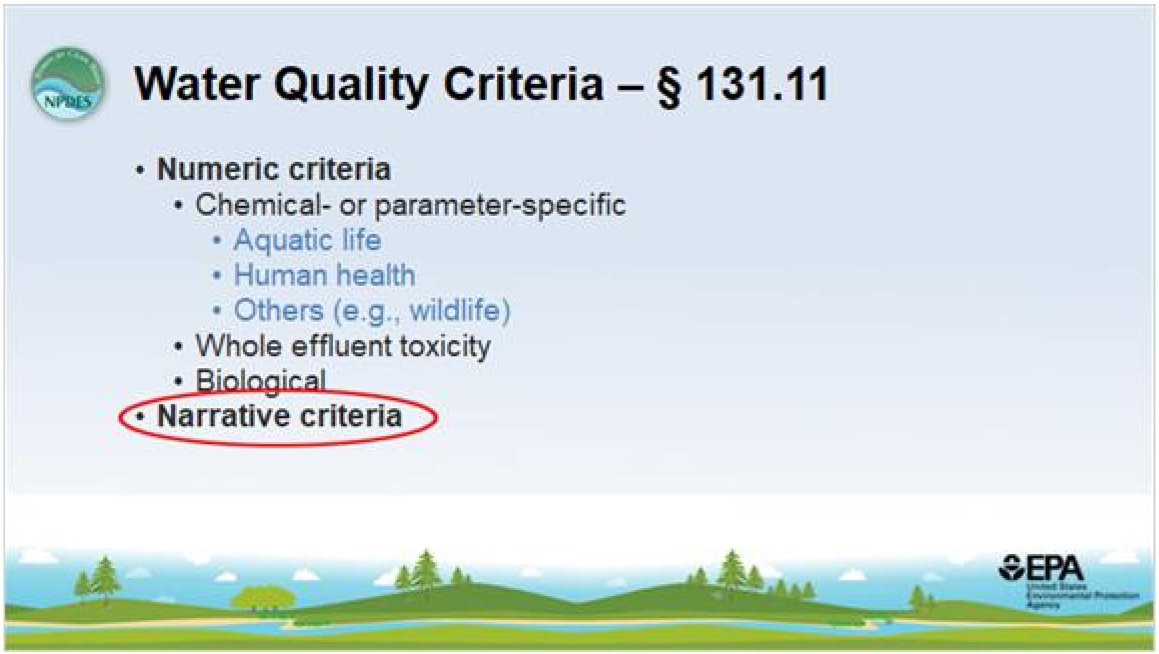
Biological criteria allow us to assess the health of a water body by actually visiting the site, carefully collecting samples of aquatic and benthic organisms, and comparing the presence, absence, and relative abundance of certain organisms to those at reference sites.

Knowing the types of organisms that are present at healthy sites, allows us to establish baseline indices that we can compare to a test site to see how it measures up. The dominance of pollutant tolerant species could be an indication of a biological impairment.

Unfortunately, while biological criteria are great measures of stream health, they are difficult to implement directly through NPDES permit requirements.

If you would like more information on biocriteria, please visit EPA's Biocriteria Web page at the address listed on the slide.

1.27 Water Quality Criteria – § 131.11

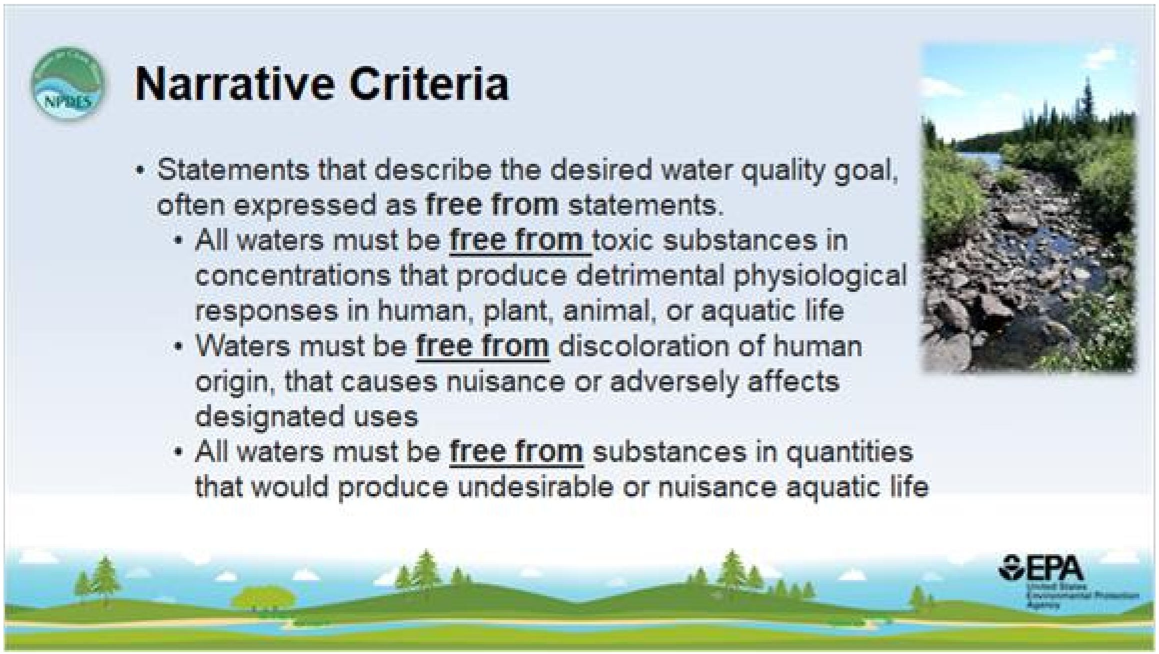


Notes:

Well, that concludes our discussion of numeric criteria.

The last category that we will discuss is narrative criteria.

1.28 Narrative Criteria



Notes:

In contrast with numeric criteria, which give quantitative recommendations of some kind, narrative criteria are statements that describe the desired water quality goal for the water body.

Narrative criteria often are expressed in the form of what we call "free from" statements.

This slide provides some examples.

One of the most common narrative criteria statements is that "All waters must be *free from* toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." In other words, we want to keep pollutants below levels that would cause acute or chronic toxicity or other adverse effects in the receiving water. Some version of this narrative criterion is present in almost all state water quality standards. You might hear someone refer to this type of narrative criterion as a "no toxics in toxic amounts" criterion. This type of criterion is very important because it is often the basis for incorporating whole effluent toxicity requirements in a permit. It also allows us to address specific pollutants that could have detrimental effects on the receiving water and its uses, but for which we do not have pollutant-specific numeric criteria.

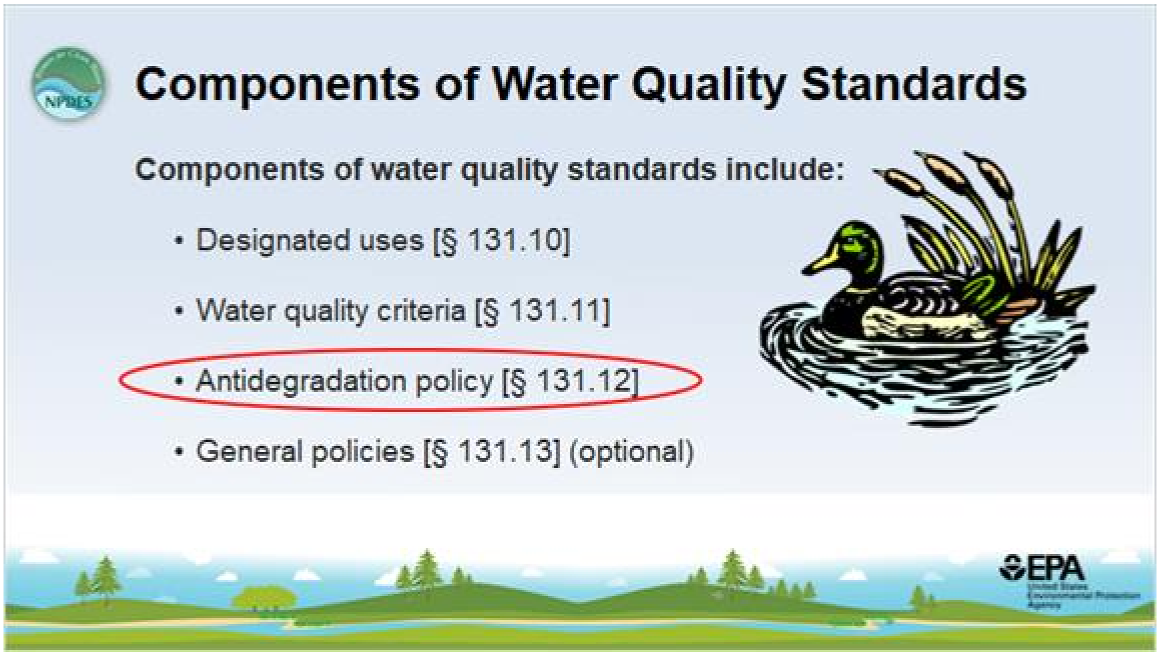
Color is another water quality concern that often is addressed using a narrative criterion such as the one provided on this slide: "Waters must be *free from* discoloration of human origin that causes nuisance or adversely affects designated uses."

Our last example prohibits substances in quantities that would produce undesirable or nuisance aquatic life.

These are simply three examples of narrative criteria. You might find something similar to these as well as other narrative criteria in your water quality standards.

Greg, what's next?

1.29 Components of Water Quality Standards



Notes:

Dave, you have brought us to the third component of water quality standards-an antidegradation policy.

Antidegradation is addressed in the regulations at 40 CFR 131.12.

1.30 Antidegradation Policy – § 131.12

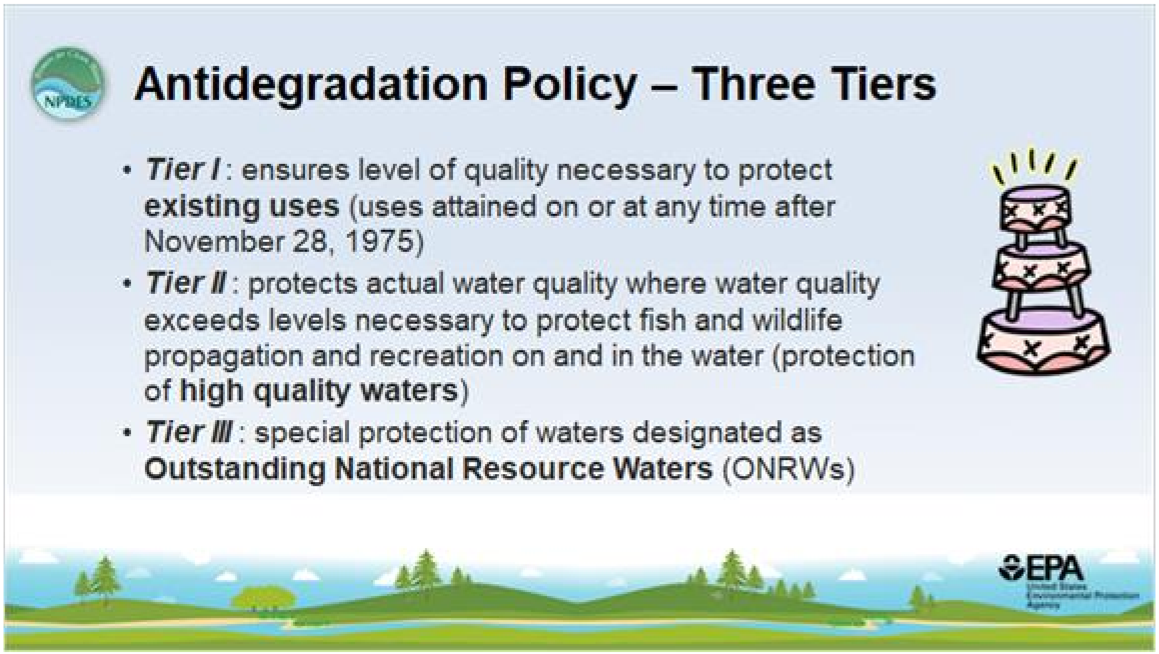
Notes:

An antidegradation policy is a policy designed to prevent unnecessary degradation of water quality.

It ensures that existing uses continue to be achieved, it protects what we call "high quality waters," and it protects waters designated as Outstanding National Resource Waters.

Each state, territory, and tribe with water quality standards has to adopt both an antidegradation policy and a method of implementation for that policy.

1.31 Antidegradation Policy – Three Tiers



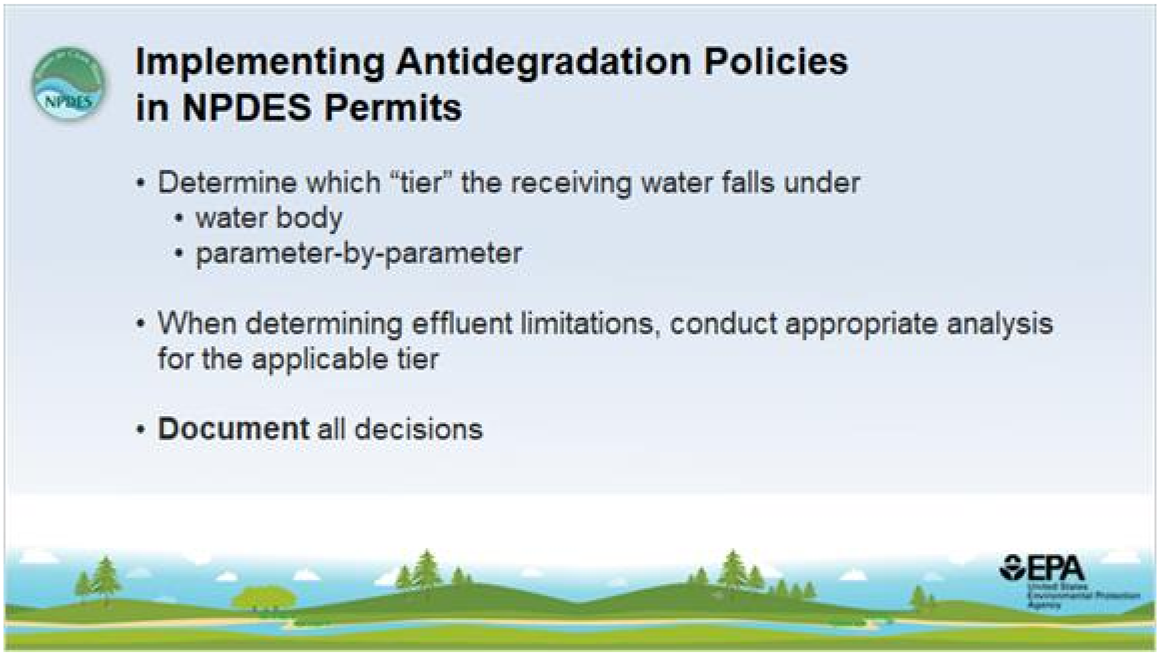
Notes:

As referenced on the previous slide, an antidegradation policy provides protection of water quality in three ways, which generally are described as three "tiers" of an antidegradation policy:

- Tier 1 ensures that a level of water quality necessary to protect *existing uses* is maintained. Existing uses are the uses of a water body that were actually attained at any time on or after November 28, 1975, which was the date of EPA's first promulgated water quality standards regulation.
- Tier 2 provides protection of *actual* water quality in the receiving water where that water quality exceeds the minimum levels necessary to protect fish and wildlife propagation and recreation in and on the water. We call such waters *high quality waters*. States, territories, and tribes have to identify procedures that must be followed and questions that must be answered before a reduction in water quality can be allowed in a high quality water. In no case may water quality be lowered to a level that would interfere with existing or designated uses.
- Tier 3 provides special protection of waters designated by a state as *Outstanding National Resource Waters* or ONRWs. Except for certain temporary changes, no permit can allow any degradation of waters designated as ONRWs. Examples of where state water quality standards might designate waters as ONRWs include national and state parks, wildlife refuges, and ecologically unique waters that need additional protection or are of special significance.

1.32 Implementing Antidegradation Policies

in NPDES Permits



Notes:

How does an antidegradation policy affect a permit writer?

First, you'll need to consider which tier applies to the receiving water for the permit you're writing.

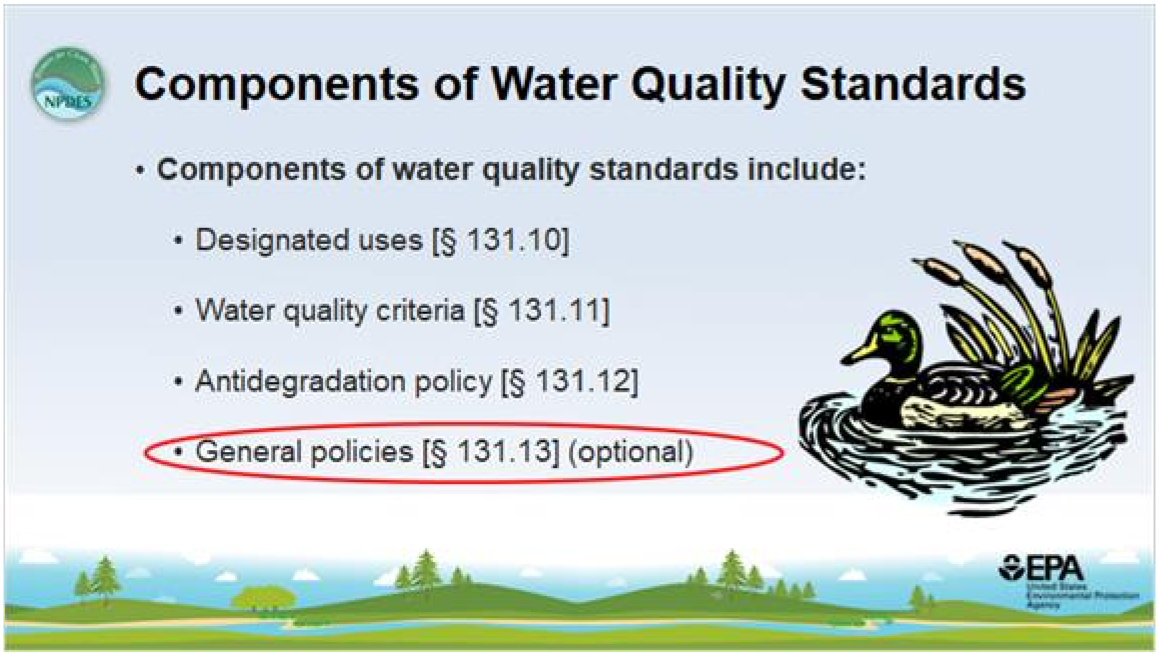
In some states, the applicable tier is determined by water body and, therefore, that water body falls into the same tier for any parameters that are present.

In other states, the applicable tier is determined on a parameter-by-parameter basis. So, multiple tiers could apply in a single water body.

After determining the applicable tier for a parameter, you should consult your state's implementation procedures for a description of how to apply the antidegradation policy in developing permit conditions for that parameter.

When applying the policy and developing effluent limitations, it also is very important to document the decision-making process in the permit record.

1.33 Components of Water Quality Standards

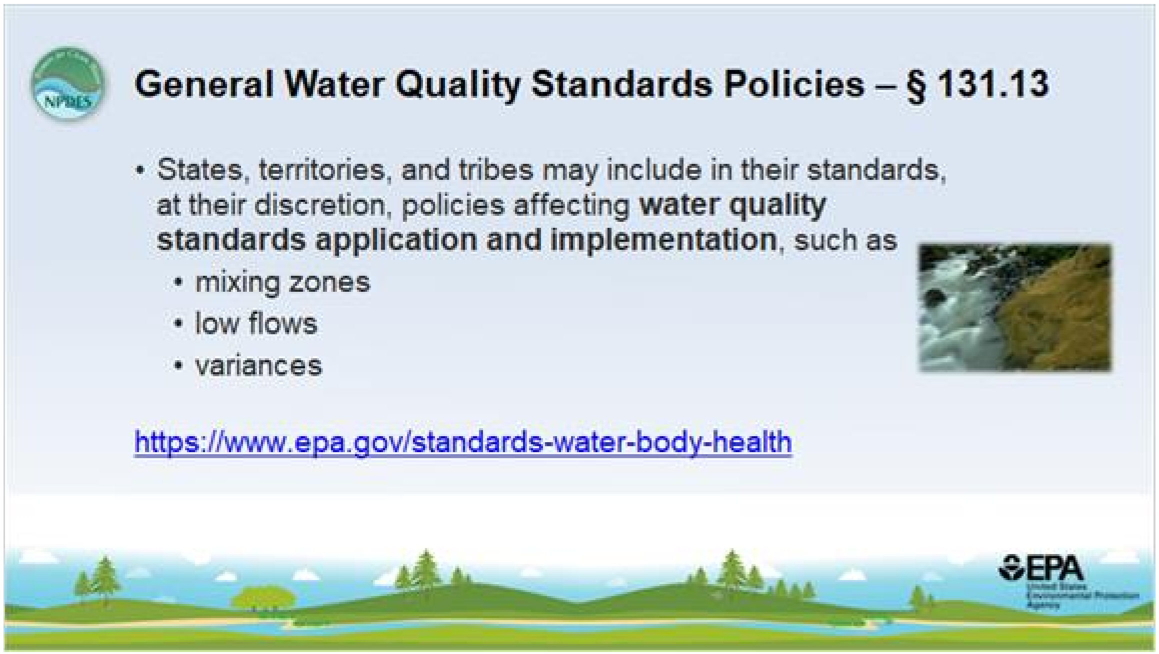


Notes:

The fourth and final component of water quality standards, addressed in the regulations at 40 CFR 131.13, is general policies affecting application and implementation of standards.

Including these policies as a part of water quality standards is optional.

1.34 General Water Quality Standards Policies – § 131.13



Notes:

So, at their discretion, states, territories, and tribes can include in their standards policies addressing implementation concerns such as mixing zones, low flows, and variances.

Most states do develop these kinds of policies in some form-either as part of their water quality standards or, perhaps, as part of their NPDES program regulations, policy, or guidance.

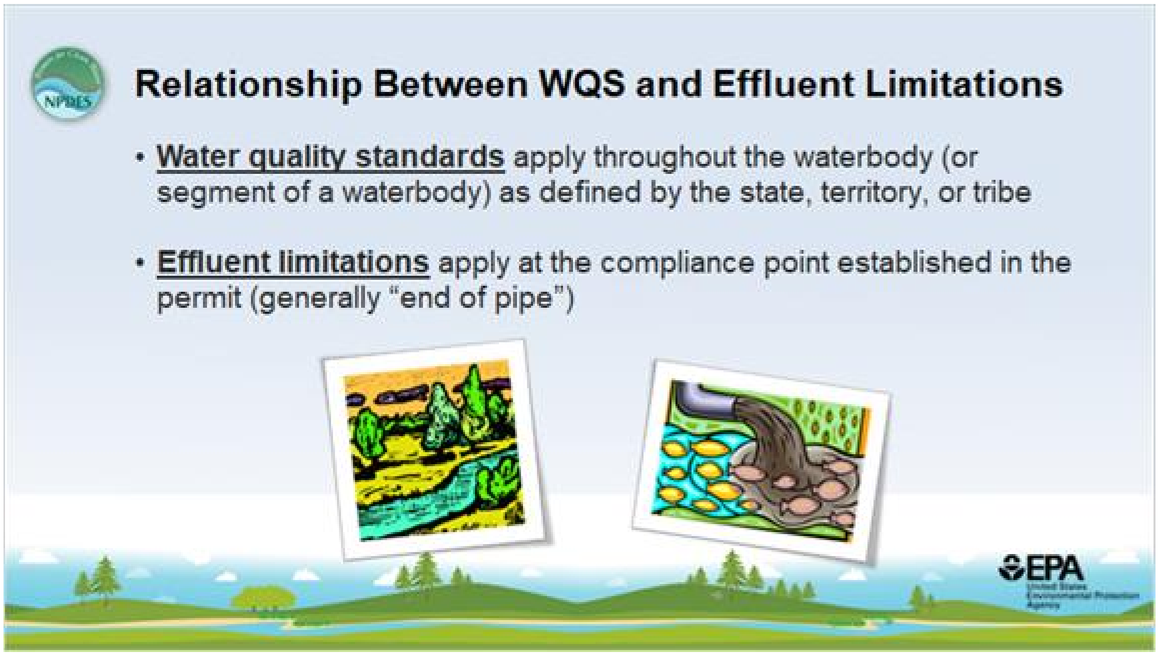
We'll discuss mixing zones and low flows and other related issues in Part II of this series.

For more information on variances and other modifications to state water quality standards, please visit the water quality standards web site maintained by EPA's Office of Science and Technology.

Well, that wraps up our discussion of water quality standards.

Dave, could you tell us about the relationship between water quality standards and effluent limitations in NPDES permits?

1.35 Relationship Between WQS and Effluent Limitations

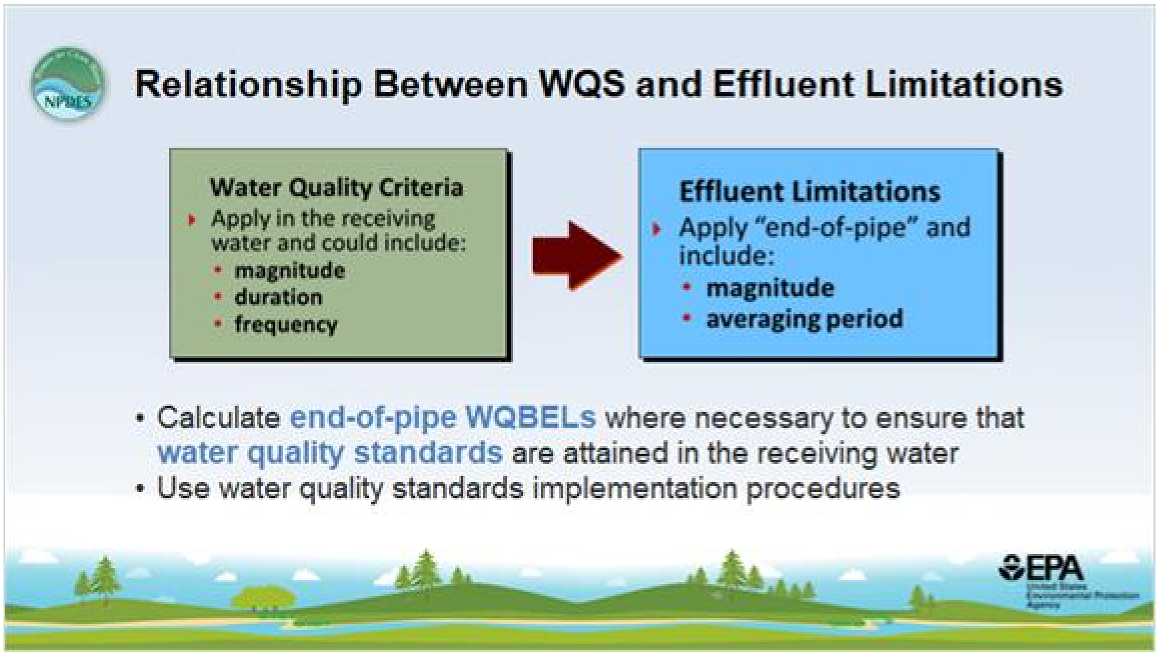


Notes:

As we discussed previously, it is important to note that water quality standards apply to a waterbody or a segment of a water body, while water quality-based effluent limitations apply at the compliance point for a point source discharge, generally at the "end of the pipe."

Therefore, we must have a process for predicting the effect of the discharge on instream water quality and for developing water quality based effluent limitations that protect instream water quality standards.

1.36 Relationship Between WQS and Effluent Limitations



Notes:

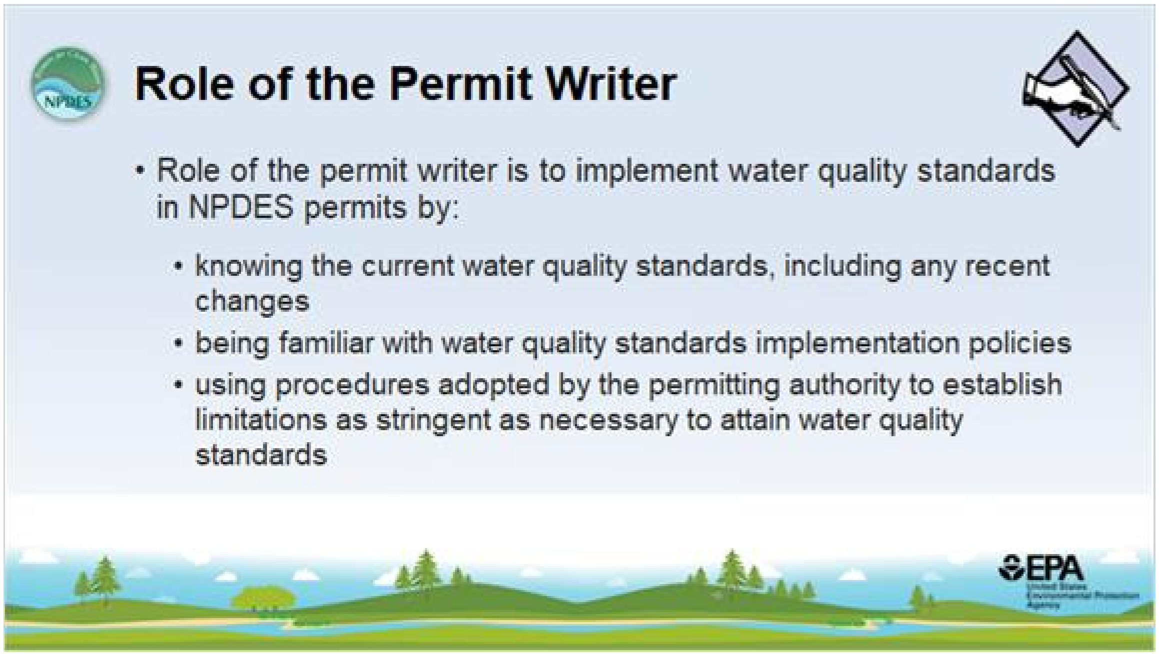
The process used to develop water quality-based effluent limitations needs to account for the unique aspects of the various types of water quality criteria that we have discussed in this module.

Remember that water quality criteria for the protection of aquatic life can have three components: magnitude, duration, and frequency. For example, an acute aquatic life criterion might be expressed as a magnitude of 10 µg/L that should not be exceeded for a duration of 1 hour at a frequency of any more than once in three years.

Similarly, effluent limitations are generally expressed with both an allowable magnitude, for example 1 mg/L, and compliance is determined over a specified averaging period, such as a daily maximum or monthly average.

Therefore, a permit writer needs a procedure that accounts for both the physical and chemical interactions between the effluent and the receiving water and that also accounts for the differences between how criteria and effluent limitations are expressed.

1.37 Role of the Permit Writer



Notes:

In the next presentation in this series, we'll look at the role of the permit writer in implementing water quality standards in more detail.

This slide provides a brief summary the permit writer's role, which includes:

- knowing the current water quality standards, including any recent changes;
- being familiar with state implementation policies; and
- using procedures adopted by the permitting authority to make this "translation" between water quality criteria and effluent limitations and establish limitations as stringent as necessary to attain water quality standards.

The most important take-home point for permit writers is to learn about your state's water quality standards and implementation policies and know where to go and who to ask if issues such as variances or standards modifications come up.