Module 3 Beneficial Uses and TMDLs

Introduction

What is the best use for the water resources in your community? What constitutes safe water to drink or swim in?

During the next decade many streams and lakes in Oregon, Washington, and Idaho will be evaluated to determine their most sensitive beneficial use (for example; drinking water, livestock watering, salmon spawning, or shellfish growing). By considering the beneficial uses of each water body, specific water quality standards may be applied, thus making the system of standards more flexible. For example, the more restrictive fecal coliform bacteria standards required in shellfish-growing areas need not be met in areas where shellfish are not harvested.

States, territories, and tribes set water quality standards. As part of these standards each establishes a Total Maximum Daily Load (TMDL) allocation plan for the highest-ranked water resources. A TMDL allocation plan establishes limits on the quantity of a pollutant that enters a stream from a specific land user or group of users.

In this module participants will examine*: Beneficial uses of water and what constitutes total maximum daily load*.

Beneficial Uses of Water

An abundant supply of good, clean water must support a variety of beneficial uses. These include drinking water for domestic use and stock watering; industrial, commercial, agricultural, irrigation, and mining use; fish and wildlife maintenance and enhancement; recreation; generation of electrical power; and preservation of environmental and aesthetic values. Drinking water is the beneficial use that usually requires the highest quality water to protect human health.

The quality of water required for each beneficial use often differs. Yet the quality of any body of surface or ground water is a function of natural influences and human activities. What should the quality of water be? What standards and criteria should apply or be accepted? Further, how can a community rank the set of social or economic needs and uses with the need for a good water quality program? For example, temperature is a physical characteristic of water. Fish such as bass, and most people, prefer warm water to swim in. However, warm water is not very tasty to drink. And cool water fish species such as trout may not reproduce and thrive in warm water. Several beneficial uses may exist for one body of water. Surface and ground water standards protect water supplies for the beneficial use that requires the highest quality water. These standards are consistent with public health and public enjoyment of Pacific Northwest waters. The standards also ensure propagation and protection of fish, shellfish, and wildlife.

Common Beneficial Uses of Waters in the Pacific Northwest

Aesthetics	Fishing	Livestock watering
Resident fish and aquatic life	Salmonid fish spawning and rearing	Transportation
Shellfish growing	Water contact recreation	Wildlife habitat production
Irrigated agriculture	Navigation	Water supply
Municipal waste treatment	Non-contact water recreation	Hydropower
		Mining

Total Maximum Daily Load

1. What is a TMDL?

A TMDL — or total maximum daily load — is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. In other words, it is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources, and includes a margin of safety and consideration of seasonal variations. In addition, a TMDL contains the reductions needed to meet water quality standards and allocates those reductions among the sources in the watershed.

2. Who is responsible for establishing and implementing TMDLs?

States, territories, and authorized tribes are responsible. If they fail to establish the TMDLs, EPA must do it. In some circumstances, EPA may establish TMDLs directly, for example, if a state requests, or if EPA determines that the TMDL is needed for interstate or boundary waterbodies.

3. How are TMDLs implemented?

TMDLs may be implemented in many ways: through state nonpoint source management programs; other federal laws and requirements, e.g., the 1996 Farm Bill, CZARA; state and local laws and ordinances; as well as local or regional watershed management programs. The proposed regulations would require that some "reasonable assurance" of implementation be included in the TMDL. Changes to the NPDES program will give EPA, in establishing a TMDL, the discretion to designate certain dischargers causing significant water quality impairment as point sources requiring an NPDES permit. Dischargers that may be designated include selected animal feeding operations, aquatic animal production facilities, and silvicultural operations.

4. When do TMDLs need to be established?

TDMLs should be established over a 15 year timeframe with waterbodies determined to be higher priority waters established earlier in this timeframe. Priorities are based on the severity of the pollution and uses of the waterbody. The proposed changes would require that some impaired waters that are drinking water sources or have endangered species also be given priority.

5. TMDLs need to be established within 15 years, but when will the individual waters actually be cleaned up?

It is very difficult to estimate a specific timeframe. The amount of time that is required for a waterbody to reach water quality standards can vary considerably, depending upon the complexity of the pollutants, the uses of the land surrounding the waterbody, and the commitment of the community or upstream dischargers to reducing pollutants.

6. What is the status of TMDL litigation?

EPA has had about 45 legal actions in 34 states. EPA is under court order or consent decree to ensure that TMDLs are established in many states. Three cases have been dismissed since 1993.

7. What is a 303(d) stream, how are 303(d) lists established, and who is responsible for establishing them?

Section 303(d) of the 1972 Federal Clean Water Act requires each state, territory, and authorized tribe to identify waters that do not meet applicable water quality standards. More precisely, these are waters that do not meet or are not expected to meet water quality standards after application of the best available wastewater treatment technologies to municipal, natural resource, or industrial discharges. These waters are designated as "Water Quality Limited" and placed on state and authorized tribe 303(d) lists of impaired waters. EPA has 30 days in which to approve the lists or add waters to the state's lists, if the Agency determines the state's list is not complete.

The section 303(d) list is a prioritized list of waters not meeting water quality standards. These state lists are comprehensive in that they identify all waterbodies exceeding water quality standards. The lists are organized into four parts: 1) waters impaired by pollutants or by unknown causes; 2) waters impaired by pollution; 3) waters in which TMDLs have been done; and 4) waters expected to meet water quality standards by the next listing cycle.

8. When do 303(d) lists need to be established?

Under current regulations, states identify their impaired or threatened waters and submit a list of these waters to EPA every two years.

9. What is the difference between the section 305(b) report and the section 303(d) lists?

Under section 305(b), states are required to monitor and assess the status of all waters and report this to Congress every two years. The section 305(b) report, or National Water Quality Inventory, presents states' findings on which waters are meeting water quality standards and which are not, while the section 303(d) list contains a prioritized list of impaired waters which need TMDLs. The information generated by states preparing section 305(b) reports is used to assist in the identification and priority ranking, while section 303(d) helps identify which waters need TMDLs. States supplement the section 305(b) assessments with other sources of water quality information when preparing the section 303(d) list of impaired waters needing TMDLs.

10. Are 40 percent of our nation's waters still not meeting water quality standards? Are all of those waters listed on the state 303(d) lists? If not, why not?

The 40 percent figure comes from the National Water Quality Inventory, which presents states' findings on which waters are meeting water quality standards, and which are not. The 40 percent is derived from the number of waters that states have actually assessed. Not all waters of the U.S. have been assessed. The number of impaired river and shoreline miles as well as the number of impaired acres of

lakes and estuaries are essentially the same for the section 303(d) list — 12.9 million lakes and estuary acres and 291,000 river and shoreline miles.

11. What is the relationship of the Section 303(d) lists and the Unified Watershed Assessments developed under the Clean Water Action Plan?

Unified watershed assessments were one of the key actions of the Clean Water Action Plan announced by the President in February, 1998. Unified watershed assessments were developed in the summer and fall of 1998 by states, tribes, and territories. Unified watershed assessments are intended to help states and tribes bring together a broad array of information on water quality and other resource conditions to identify watersheds where restoration activities and funding could be most effectively targeted. States and tribes worked with appropriate agencies and the public to identify these watersheds. The assessments were based on existing information and data, for example, state section 303(d) lists priority areas and concerns identified through locally led conservation processes and USDA's State Technical Committees; National Forest Land and Resource Management Plans; and state drinking water source assessments.

12. What are the major causes of impairments in our waterbodies?

Both the 1996 and 1998 section 303(d) lists, as well as the section 305(b) report, reflect similar patterns with sediments, nutrients, and pathogens being the top three causes of impairment. Other causes include: dissolved oxygen, high temperature, habitat and flow alterations, pH, metals, mercury (including fish advisories), and pesticides.

13. What is the relationship of TMDLs to the watershed approach?

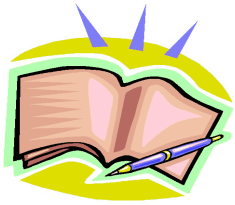
Lasting solutions to water quality problems are best achieved by looking at all activities in a watershed. TMDLs are an important part of translating water quality standards into any point and nonpoint source load reductions needed to achieve healthy watersheds. EPA encourages watershed approaches in establishing TMDLs so that the cumulative and synergistic effects may be considered. TMDLs will be less expensive and more effective when bundled together to clean up an entire watershed. At the watershed level, TMDLs can structure innovative solutions, e.g., nutrient trading among wastewater dischargers and nonpoint sources; or the development of new point or nonpoint source technologies. The watershed action strategies developed in response to the Clean Water Action Plan are also a vital tool in meeting our clean water goals.

Discussion Points

- What are the three most important "beneficial uses" of water in the watershed where you live? Why?
- Are their any streams in your community where the beneficial uses have been identified? If yes, find the standards the water quality is being evaluated against and discuss them with your family. What do they think about them?
- For a local stream, lake, or river obtain a developed management plan designed to reduce pollution from your local Natural Resource Conservation Service Office or Conservation District. After review, highlight the key components and discuss the risks and benefits of the plan.
- What do you think about a local industry, farm, or sewage treatment plant obtaining a new or increased pollution discharge permit into a local stream? Discuss and record 5 or more good reasons why this might be justified.
- How are 303(d) lists established and who is responsible for establishing them in your community?
- What is the relationship of beneficial use, TMDLs, and the watershed approach?

Major Points to Remember

- Tribes and states in the Pacific Northwest set beneficial water uses. They select the scientific criteria to support each beneficial use and make sure they are evaluated against a standard. For example, uses for each waterbody might include drinking water supply, contact recreation (swimming), and aquatic life support (fishing).
- Section 303(d) of the 1972 Federal Clean Water Act requires that each tribe or state identify waters that do not meet applicable water quality standards. More precisely, these are waters that do not meet or are not expected to meet water quality standards after application of the best available wastewater treatment technologies to municipal and industrial discharges. These waters are designated as "Water Quality Limited," and placed on the 303(d) list.
- The Clean Water Act, section 303, establishes the water quality standards and TMDL programs.
- A TMDL or total maximum daily load is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources.



Journal and Evaluation

Based upon your experience write down in your journal 10 or more things that water "must be" (a standard) in order for you to consider it safe for your family to drink.

Short-course Presenters

During the pilot stage of this program several approaches were taken to present this module. The lecture, discussion points, and journaling in the guide can work very well. The journaling activity helps to lay the groundwork for the discussion of standards in Part Two of the short-course. Additional activities also were used and are presented below.

The best way to teach the TMDL concept is to localize it using TMDLs in the area where the program will be taught. Have local experts who are engaged in completing or determining TMDLs for waterbodies in the county or watershed basin explain the process that they are using or have used. Have them bring actual maps that identify streams where TMDLs have been listed and share collected data. For example, we used the lower Yakima River Basin in Washington State, in Idaho we used Plummer Creek on the Coeur d'Alene Indian Reservation, and in Oregon we used Lobster Creek, a tributary of the Rogue River.

Bringing a disposable diaper and demonstrating how much water it can hold was a popular activity to reinforce the TMDL concept. This is one of the best analogies to use. A stream, river, or lake is like a disposable diaper. It can hold quite a bit of pollutants until it becomes uncomfortable. If it isn't changed it can become a "blowout" and make a big mess. TMDLs are like the disposable diapers. Until a community or watershed can make adjustments to reduce the pollution loads and/or limit the amount, they may be necessary. A state establishes a TMDL until the pollution situation can be changed or delisted.