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GAO

Report to the Chairman, Subcommittee on Water Resources and Environment, Committee on Transportation and Infrastructure, House of Representatives

January 2003

WATER QUALITY

Improved EPA Guidance and Support Can Help States Develop Standards That Better Target Cleanup Efforts

GAO-03-308

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Highlights

Highlights of GAO-03-308, a report to the Chairman, Subcommittee on Water Resources and Environment, Committee on Transportation and Infrastructure, House of Representatives

Why GAO Did This Study

Water quality standards are composed of designated uses and criteria. These standards are critical in making accurate, scientifically based determinations about which of the nation's waters are in need of cleanup. To assess EPA and states' actions to improve standards, the Chairman of the Subcommittee on Water Resources and Environment asked GAO to determine the extent to which (1) states are changing designated uses when necessary and EPA is assisting the states toward that end and (2) EPA is updating its criteria documents and assisting states in establishing criteria that can be compared with reasonably obtainable monitoring data.

What GAO Recommends

GAO recommends that the Administrator, EPA (1) provide additional guidance regarding use changes, (2) follow through on plans to assess the feasibility of establishing a clearinghouse of approved use changes, (3) set a time frame for developing sedimentation criteria, (4) develop alternative, scientifically defensible monitoring strategies that states can use to determine if water bodies are meeting the criteria, and (5) develop guidance and a training strategy to help EPA regional staff in determining the scientific defensibility of proposed criteria modifications. EPA agreed to give serious consideration to GAO's recommendations and provided several technical comments and clarifications.

www.gao.gov/cgi-bin/getrpt?GAO-03-308.

To view the full report, including the scope and methodology, click on the link above. For more information, contact John B. Stephenson at (202) 512-6225 or stephensonj@gao.gov.

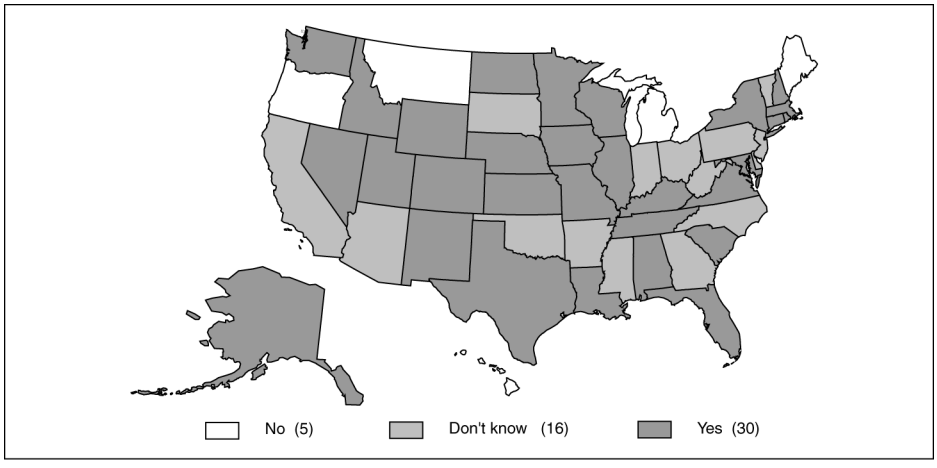
What GAO Found

The extent to which states are changing designated uses varies considerably. Regardless of the number of use changes states have made to date, nearly all states report that some portion of the water bodies within their states currently need changes to their designated uses. Among the key reasons these needed use changes have not been made is states' uncertainty over the circumstances in which use changes are acceptable to EPA and the evidence needed to support those changes.

As required, EPA has developed and published criteria for a wide range of pollutants. However, EPA has not developed criteria for sedimentation or finalized criteria for nutrients—the pollutants that, according to EPA data, account for a relatively large share of the nation's impaired waters. Even when national criteria do exist, some states have difficulty establishing their criteria in such a way that they can be compared with reasonably obtainable monitoring data. In addition, a vast majority of states find it difficult to modify their existing criteria when warranted by new information or other circumstances.

Changing either designated uses or criteria is considered a standards modification. Twenty-two states reported that an improvement in the process of changing designated uses would result in different water bodies being slated for cleanup, and 22 states reported that an improvement in the process of modifying criteria would have that effect. Superimposing the states' responses indicates that 30 states would have different water bodies slated for cleanup with an improvement in the process of modifying standards.

States Reporting That Different Water Bodies Would Be Slated for Cleanup if the Process of Changing Standards Were Improved



Source: GAO.

Note: GAO analysis of state data.

Contents

Abbreviations

ASIWPCA	Association of State and Interstate Water Pollution Control Administrators
EPA	Environmental Protection Agency
NPDES	National Pollution Discharge Elimination System
TMDL	total maximum daily load
UAA	use attainability analysis

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United States General Accounting Office
Washington, D.C. 20548

January 30, 2003

The Honorable John J. Duncan, Jr.
Chairman, Subcommittee on
Water Resources and Environment
Committee on Transportation
and Infrastructure
House of Representatives

Dear Mr. Chairman:

In response to your request, this report discusses the extent to which (1) states are refining designated uses when necessary and the Environmental Protection Agency (EPA) is assisting states toward that end and (2) EPA is updating its criteria documents and assisting states in establishing criteria that can be compared with reasonably obtainable monitoring data. We include recommendations to the Administrator of EPA to provide additional guidance regarding designated use changes to the states and regional offices that clarifies when a change is appropriate, what data are needed to justify the change, and how to establish subcategories of uses; follow through on the agency's plans to assess the feasibility of establishing a clearinghouse of approved designated use changes by 2004; set a time frame for developing and publishing nationally recommended sedimentation criteria; develop alternative, scientifically defensible monitoring strategies that states can use to determine if water bodies are meeting the criteria; and develop guidance and a training strategy that will help EPA regional staff determine the scientific defensibility of proposed criteria modifications.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to the appropriate congressional committees, the Administrator of EPA, and the Director of the Office of Management and Budget. We will make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

Please call me or Steve Elstein on (202) 512-3841 if you or your staff have any questions. Key contributors to this report are listed in appendix IV.

Sincerely yours,

John B. Stephenson
Director, Natural Resources
and Environment

Executive Summary

Purpose

According to the Environmental Protection Agency (EPA), more than 20,000 bodies of water throughout the country are too polluted to meet water quality standards, and it may cost billions of dollars to clean them up. Under the Clean Water Act, states adopt water quality standards as the benchmarks against which pollution levels within their water bodies are measured. As such, the standards are critical in making accurate, scientifically based determinations as to which waters are impaired and require attention. In recent years, however, questions have been raised as to whether current water quality standards are accurate and, therefore, whether the right waters are being targeted for cleanup.

In his capacity as Chairman of the House Subcommittee on Water Resources and Environment, Committee on Transportation and Infrastructure, Representative Duncan asked GAO to determine whether EPA and the states are doing all they should to ensure that the two key components of water quality standards—the "designated uses" that identify the purposes which a given body of water is intended to serve and the "water quality criteria" that are used to determine whether the water's quality is high enough to achieve these uses—can be used to make accurate determinations as to which waters are impaired and therefore require remediation. Specifically, GAO was asked to determine the extent to which (1) states are changing designated uses when necessary and EPA is assisting the states toward that end and (2) EPA is updating its criteria documents and assisting states in establishing criteria that can be compared with reasonably obtainable monitoring data.

To respond to the Chairman's request, GAO obtained information from state water quality officials through a Web-based survey of the 50 states and the District of Columbia. GAO also completed telephone surveys with all 10 EPA regional offices and conducted site visits to Kansas, Ohio, and Montana. GAO also met with, and obtained information from, officials from EPA's headquarters and the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA)[1] and interviewed representatives of various interest groups such as Earthjustice and the American Farm Bureau Federation. (See chapter 1 for a detailed description of our scope and methodology.)

[1] ASIWPCA is an independent, nonpartisan organization of state and interstate water program managers.

Background

Water quality standards comprise two key components—designated uses and water quality criteria. Designated uses are uses assigned to water bodies, such as drinking water, contact recreation (e.g., swimming), and aquatic life support (e.g., fishing). Water quality criteria specify pollutant limits that are intended to protect the designated uses of a water body, such as the maximum allowable concentration of a pollutant (e.g., iron) or an important physical or biological characteristic that must be met (e.g., an allowable temperature range).

Water quality criteria can be numeric (i.e., quantitative) or narrative (i.e., qualitative), and they can include components such as the frequency and duration of monitoring needed to determine whether the criteria are being met. To develop criteria, states rely heavily on EPA-developed "criteria documents" containing the technical data that help states adopt pollutant levels that, if not met, may preclude a water body from meeting its designated uses. EPA is responsible for developing and revising criteria documents in a manner that reflects the latest scientific knowledge. States may adopt these criteria as recommended by EPA, adapt them to meet state needs, or develop criteria using other scientifically defensible methods.

States are required to review both their waters' designated uses and associated criteria periodically and propose changes to EPA as appropriate. Before its changes can take effect, the state must submit them to EPA and obtain approval of the changes. EPA is required to review and approve or disapprove standards changes proposed by a state within 60 to 90 days.

States generally determine if a water body's designated use is being achieved by comparing monitoring data with applicable state water quality criteria. If the water body fails to meet the applicable standards, the state is required to list that water as impaired, calculate a pollution budget under EPA's Total Maximum Daily Load (TMDL) program, which specifies reductions necessary to achieve the standard, and then eventually implement a cleanup plan. Thus, as noted in a 2001 report by the National Academy of Sciences, water quality standards are the foundation on which the entire TMDL program rests: if the standards are flawed, all subsequent steps in the TMDL process will be affected.

Results in Brief

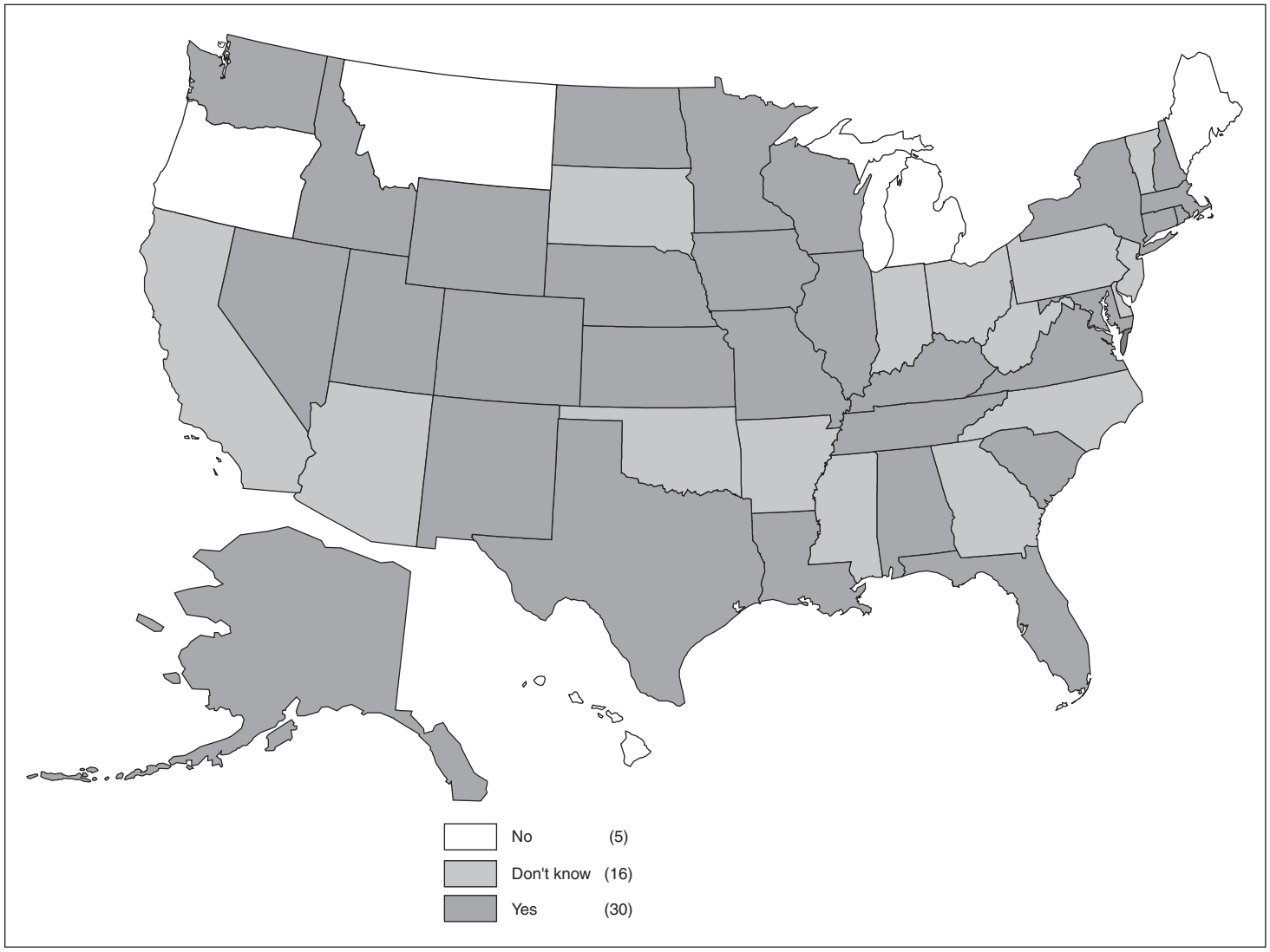
The extent to which states are changing designated uses varies considerably, with states making anywhere from no use changes to more than 1,000 use changes during the 5-year period from 1997 through 2001. Regardless of the number of use changes states have made to date, nearly all states report that they have water bodies within their states that currently need changes to their designated uses. According to the states, some of these needed designated use changes have not been made because of barriers states face to making these changes, with many citing, for example, a lack of resources and monitoring data or resistance from interest groups and affected parties. Importantly, in some instances, another key reason needed use changes have not been made is states' uncertainty over the circumstances in which use changes are acceptable to EPA and the evidence needed to support those changes. Many states said they need additional assistance from EPA to make accurate and defensible decisions on what some believe will be a much larger number of designated use changes in coming years. Specifically, they cited a need for additional EPA guidance that clarifies both the circumstances under which a use change is acceptable and the type of evidence needed to support those changes. EPA headquarters officials acknowledge this need and have formed a national working group to develop additional guidance regarding designated use changes. Such guidance would also (1) help clarify to EPA regional officials what state-proposed changes are acceptable and (2) promote more consistent review and approval policies across EPA's 10 regional offices. Among other things, GAO is recommending that EPA clarify its guidance to the states and regions on when a use change is appropriate and what constitutes an approvable designated use change and develop a clearinghouse that provides the states and regions with examples of approved use changes.

As required, EPA has developed and published criteria for a wide range of pollutants. However, EPA has not developed criteria for sedimentation and is currently in the process of developing the complex criteria needed for nutrients. According to EPA data, these pollutants account for a relatively large share of the nation's impaired waters. Hence, it is not surprising that states responding to GAO's survey rank these two pollutants as their highest priorities for criteria development. Even when EPA criteria documents have been developed, some states have reported difficulty in using the documents to establish criteria in such a way that the criteria can be easily compared with reasonably obtainable monitoring data. As a related matter, states also expressed difficulty in modifying the criteria they already have in place when they find it necessary to reflect, for

example, new data or changing ecological conditions. While most states cited resource constraints as a barrier that affects their ability to make criteria modifications, more than half of the states also cited EPA's approval process—noting, for example, insufficient assistance from their respective EPA regional offices in helping them understand what data are necessary to justify a criteria modification. Inconsistency among EPA regional offices in providing this assistance has been due, in part, to a lack of staff expertise among some offices in determining the scientific feasibility of criteria modifications. To help states better meet their criteria needs, GAO is recommending that EPA (1) set a time frame for developing and publishing sedimentation criteria, (2) develop alternative, scientifically defensible monitoring strategies that states can use to determine if water bodies are achieving their water quality criteria, and (3) develop guidance and a training strategy that will help EPA regional standards staff determine the scientific defensibility of proposed criteria modifications.

Taken together, states' designated uses and water quality criteria, which comprise their water quality standards, determine how states identify their impaired waters. If states are unable to correctly identify their impaired waters, they risk focusing their limited resources on the wrong water bodies and/or exposing their citizens to health and environmental risks. As figure 1 illustrates, 30 states reported that if improvements were made to the process of modifying standards (through changes to designated uses and/or criteria), different waters would be identified for TMDL development. Significantly, this total does not reflect the effects on impaired waters lists of new criteria developed by EPA and the states. As EPA issues new numeric criteria for sedimentation and other pollutants and finalizes the nutrient criteria currently under development, states will be required to adopt numeric criteria for these key pollutants. As states adopt the new criteria, they will likely list different waters as impaired.

Figure 1: States Reporting That Different Water Bodies Would Be Slated for Cleanup if Improvements Were Made to the Process of Changing Standards



Source: GAO.

Note: GAO analysis of state data.

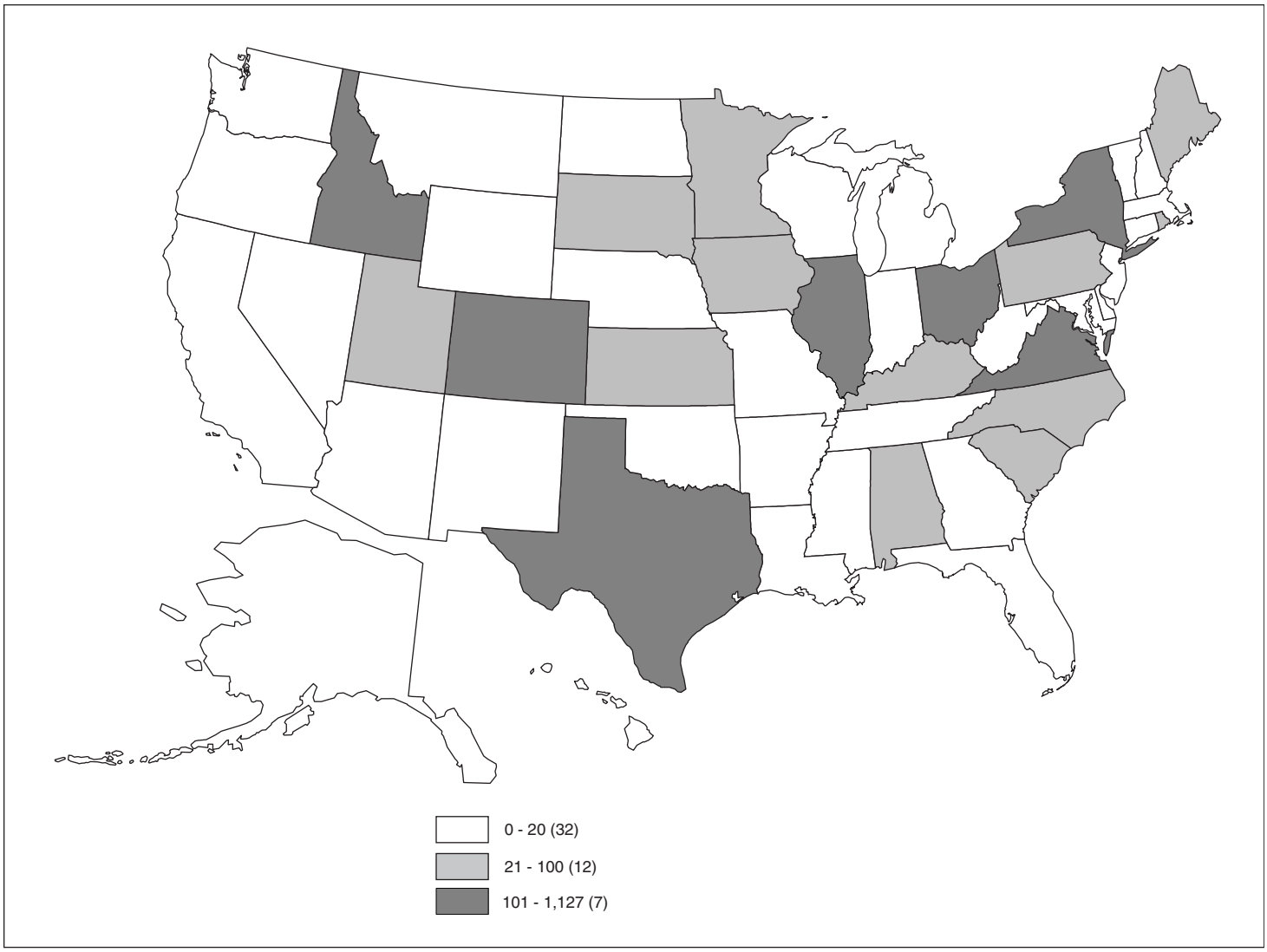
Principal Findings

States' Practices in Changing Designated Uses Vary Widely

As figure 2 illustrates, states vary widely in the extent to which they have made designated use changes, with states making anywhere from no use changes to more than 1,000 use changes during the 5-year period from 1997 through 2001. Regardless of the number of designated use changes that have been made to date, nearly all states told GAO that designated use changes will be needed in the future. The total number of such changes may dwarf those already made. For example, Oregon officials noted that while the state did not make any use changes from 1997 through 2001, they believe designated use changes are needed for more than 90 percent of its basins. Four other states reported that more than 50 percent of their water bodies currently need use changes. Many states explained their current need to make designated use changes by noting, among other things, that many of their original use decisions, made during the 1970s, were made without the benefit of accurate data. States' survey responses also indicate that states believe more protective uses are needed for some waters, while less protective uses are needed for others.

A key reason states have not made more of their needed designated use changes, according to responses to the GAO survey, is the uncertainty many state water quality officials face as to the circumstances under which use changes are acceptable and the evidence needed to support those changes. While EPA published guidance regarding designated use changes in 1994, 43 percent of states reported that they need additional guidance on when and how to make designated use changes. EPA officials from 9 of the 10 EPA regions also acknowledged that states need better guidance on when designated use changes are appropriate and the data needed to justify a use change. EPA headquarters officials told GAO that they also recognize the states' need for this kind of additional guidance and have formed a national working group to address this need.

Figure 2: Number of Designated Use Changes Reported by Each State from 1997 through 2001



Source: GAO.

Notes: GAO analysis of state data.

The designated use changes reported by the states include both changes that resulted in more protective uses and changes that resulted in less protective uses.

EPA regional officials explained to GAO that lack of clarity in the 1994 guidance regarding the type and amount of data that would constitute an approvable use change has led to varying regional interpretations and, consequently, inconsistency in approval decisions made by the regions. EPA headquarters officials also acknowledge this inconsistency and note that regional inconsistency in approving proposed designated use changes has been a long-standing concern.

Importantly, 22 states indicated that if the process for changing designated uses were improved in a way that allowed them to assign more accurate designated uses, different water bodies would be targeted for cleanup under the TMDL program. (An additional 16 states said they did not know whether different water bodies would be slated for TMDL development.) Most EPA regional officials agreed; officials from 7 of EPA's 10 regional offices reported that different water bodies would be slated for cleanup if the process of changing designated uses were improved.

States Need Criteria for Some Pollutants and Assistance in Applying and Modifying Existing Criteria

Water quality criteria are the measures by which states determine if designated uses are being attained, and therefore they play an equally important role in identifying impaired waters for cleanup. If nationally recommended criteria do not exist for key pollutants or if states have difficulty using or modifying existing criteria, states may not be able to accurately identify water bodies that are not attaining their designated uses. Several barriers currently prevent states from using some of the criteria they need to identify impaired water bodies. Specifically, (1) EPA has not developed criteria documents for some key pollutants that cause a relatively large share of the nation's water impairments; (2) even when EPA has developed criteria recommendations, many states have difficulty using some of the criteria to determine whether their water bodies are meeting standards; and (3) most states have difficulty modifying the criteria they already have in place to better meet their needs or to reflect new information.

Regarding the first barrier, while EPA has developed and published criteria documents for a wide range of pollutants over a period of decades, it has not yet issued numeric water quality criteria recommendations for sedimentation and other key pollutants and is currently in the process of developing nutrient criteria. These pollutants together cause approximately 50 percent of water quality impairments nationwide. Many states responding to GAO's survey indicated that these pollutants are among those for which numeric criteria are most needed. Specifically,

when asked to identify the top three such pollutants, the pollutants most frequently cited were nutrients, followed by sediment and pathogens. EPA explained that the delay in developing and publishing key criteria has been due to various factors, such as the complexity of the criteria and the need for careful scientific analysis, as well as an essentially flat budget accompanied by a sharply increased workload.

Regarding the second barrier, even where criteria documents have been published by EPA, states reported that the criteria cannot always be used because water quality officials sometimes cannot perform the kind of monitoring that the criteria documents specify, particularly in terms of frequency and duration. GAO's survey asked states the extent to which they have been able to establish criteria that can be compared with reasonably obtainable monitoring data. About one-third reported that they were able to do so to a "minor" extent or less, about one-third to a "moderate" extent, and about one-third to a "great" extent. Mississippi's response noted, for example, that the state has adopted criteria that specify that samples must be collected on four consecutive days. The state noted, however, that its monitoring and assessment resources are simply insufficient to monitor at that frequency. Mississippi is not alone: a 2001 report by the National Research Council found that there is often a "fundamental discrepancy between the criteria used to determine whether a water body is achieving its designated use and the frequency with which water quality data are collected." To address this discrepancy, regional EPA officials have suggested that EPA work with the states to develop alternative methods for determining if water bodies are meeting their criteria, such as a random sampling approach to identify and prioritize impaired waters.

Regarding the third barrier, states are required to periodically review and modify the criteria they already have in place, but 43 states reported that it is "somewhat" to "very" difficult to do so. Given their current fiscal conditions, most state water quality officials said that they lack the considerable resources (including data, funding, and expertise) needed to modify their criteria. Significantly, however, more than half of the states reported that EPA's approval process is a barrier they face when trying to modify their criteria. In this connection, respondents also noted that EPA regional offices are inconsistent in the type and amount of data they deem sufficient to justify a criteria change. Some regional officials told us that this inconsistency is explained, in part, by staff turnover in the regional offices. Likewise, a 2000 EPA report found that less tenured staff in some regional offices often lack the technical experience and skill to work with the states in determining the "scientific feasibility" of state-proposed

criteria modifications. GAO concluded that additional headquarters guidance and training of its regional water quality standards staff would help to facilitate meritorious criteria modifications while protecting against modifications that would result in environmental harm.

Recommendations

At the end of chapter 2, GAO makes a number of recommendations to the EPA Administrator to help ensure that the designated uses in place under EPA's water quality standards program provide a valid basis for decisions about which of the nation's waters should be targeted for cleanup. Along similar lines, GAO makes recommendations to the Administrator at the end of chapter 3 to help improve the states' abilities to adopt, apply, and modify water quality criteria so that they, too, are more effective in accurately determining water impairments.

Agency Comments

GAO provided EPA with a draft of this report for its review and comment. EPA's January 14, 2003, letter is included in appendix III. To obtain the states' perspectives, GAO also provided the draft report to ASIWPCA, which in turn provided it to water quality standards experts from Ohio and South Carolina for their review.

EPA stated that the agency will give serious consideration to the report's recommendations. EPA also offered specific comments dealing with the report's discussion of (1) EPA's progress in developing nutrient and sedimentation criteria, (2) new criteria for nutrients, sedimentation, and other pollutants causing an increase in the number of waters identified as impaired by states, (3) states' concerns about developing and adopting nutrient criteria, (4) states' need to change some of their designated uses, and (5) barriers states face to changing designated uses. These issues, and our responses, are discussed at the end of chapters 2 and 3. In addition, EPA also provided GAO with a number of more detailed technical suggestions and clarifications. These have been incorporated into the report as appropriate.

The water quality standards experts from Ohio and South Carolina who reviewed the report on behalf of ASIWPCA offered several specific clarifications and suggestions, all of which were incorporated in the report. ASIWPCA officials noted that since the reviewers' comments were not considered for endorsement by the association's membership, they should be viewed as informal suggestions to enhance the accuracy and

completeness of the report. GAO also verified specific state information noted in the draft report with representatives from those states and made modifications as necessary.

Introduction

The Federal Water Pollution Control Act, commonly referred to as the Clean Water Act, was enacted in 1972. One of its primary goals is to achieve and maintain water quality for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water. As a first step toward achieving this goal, states were required to adopt water quality standards. These standards identify thresholds above which water bodies are deemed to be impaired and in need of cleanup. The act specifies that water quality standards should consist of designated uses and water quality criteria. Designated uses identify the purposes for which a given body of water is intended to serve, such as drinking water, contact recreation (e.g., swimming), and aquatic life support (e.g., fishing). Water quality criteria are used to determine whether the water's quality is high enough to support these uses.

In addition to requiring the states to set standards, the act also requires that states periodically review their standards and revise them as needed. Periodic review and revision of water quality standards is important because standards are the foundation of several water quality programs, such as the TMDL program. For this reason, water quality standards play a key role in achieving the goals of the Clean Water Act.

Designated Uses

States must determine designated uses by considering the use and value of their water bodies for public water supplies; the protection of fish, shellfish, and wildlife; and for recreational, agricultural, industrial, and navigational purposes. In situations where water quality standards specify designated uses less protective than those that are presently being attained, the state is required to revise its standards to reflect the uses actually being attained. In addition, states must assign designated uses to protect any "existing use"—defined by EPA regulations as any use actually attained by a water body on or after November 28, 1975.

Federal regulations state that, with EPA approval, a state may remove a designated use that is not an existing use if the state can demonstrate that it is not feasible to attain that designated use. According to the language of the regulations, a designated use change may be made for one of the following reasons:

- naturally occurring pollutant concentrations prevent the attainment of the use;

- natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met;

- human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place;

- dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use;

- physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

- controls more stringent than those required by the act would result in substantial and widespread economic and social impact.

To demonstrate that a current designated use is not feasible for one of these reasons, states can conduct a use attainability analysis (UAA). A UAA is a structured scientific assessment of the factors affecting the attainment of the use, which may include physical, chemical, biological, and economic factors as described above. States that want to remove a designated use, for example, by removing a primary contact recreation use such as swimming while retaining a secondary contact recreation use such as boating, must conduct a UAA and include the results of the analysis in their submittal for a use change to EPA. States that want to increase the stringency of a designated use are not required to conduct a UAA.

In addition to changing uses for individual water bodies, states may also add subcategories of designated uses. For example, a state may wish to create designated use subcategories that distinguish between cold and warm water fisheries, as opposed to a single, more general fishery use. These types of more stratified designated uses are referred to by the National Academy of Sciences as “tiered” designated uses.

Water Quality Criteria

In addition to assigning designated uses, states must also adopt water quality criteria that specify pollutant limits intended to protect those uses. Criteria can be either numeric or narrative, and they can include components such as frequency and duration of monitoring needed to determine if criteria are being met. Numeric criteria specify quantitative limits on pollutant levels that will protect a designated use. For example, states might specify a maximum allowable concentration for iron in order to protect a water body designated for public water supply or an allowable temperature range to protect a water body for aquatic life. Narrative criteria are descriptions of physical or biological conditions that must be met in order for the water body to be identified as achieving its designated use. For example, states might have a narrative criterion for all surface waters stating that waters "shall be free from floating debris, oil, scum, and other floating materials entering the waters as a result of human activity in amounts sufficient to be unsightly or cause degradation."

In addition to numerous chemical-specific criteria, states have sometimes adopted biological, nutrient, and sedimentation criteria, as well. For example, biological criteria can be developed to describe a desired aquatic community based on the number and kind of organisms expected to be present in a water body.[1] Nutrient criteria are a means to protect water bodies from nutrient over-enrichment and cultural eutrophication—a condition in an aquatic ecosystem where high nutrient concentrations stimulate the rapid growth of algae. Nutrients, such as phosphorus and nitrogen, occur in waters naturally as well as from pollution sources such as wastewater treatment plants and runoff from agriculture. Sedimentation criteria describe conditions that will avoid the adverse effects of sediments. Sediments, for example sand and silt, accumulate through natural processes such as erosion and from activities such as mining, logging, and urban development.

To assist states, EPA is required to develop, publish, and revise criteria documents that contain the technical information states need to develop their water quality criteria. States may adopt EPA's nationally recommended criteria, modify nationally recommended criteria to reflect site-specific conditions, or adopt criteria based on other scientifically defensible methods.

[1] According to EPA, there is a growing recognition of the importance of biological criteria in water quality protection.

Standards Review and Revision

Under the Clean Water Act, states are required to review their water quality standards at least every 3 years, make revisions as needed, and submit any changes to EPA for review and approval (or disapproval).[2] Once states submit their proposals, EPA has 60 days to approve or 90 days to disapprove of the standards change. In its review of state changes, EPA must determine whether

- the state has adopted designated uses which are consistent with the requirements of the Clean Water Act,
- the state has adopted criteria that protect the designated uses,
- the state has followed its legal procedures for revising or adopting standards,
- the state standards are based upon appropriate technical and scientific data and analyses, and
- the state submission meets the requirements of the regulations.

If a state has met these conditions, EPA will generally approve the standards change.[3] If a state has not met these conditions, EPA must disapprove the change, specify what the state needs to do to correct the problem, and promulgate a new or revised standard when necessary to meet the requirements of the act if the state fails to revise its standards to address EPA's concerns. Historically, states could implement new standards pending a decision by EPA, but a recent court decision[4] and subsequent regulations, commonly referred to as the Alaska rule, declared that water quality standards are not effective until approved by EPA.

[2] EPA's regulations provide that the minimum requirements for a state water quality standards submission to EPA include, among other things, an antidegradation policy to maintain and protect the existing uses of water bodies.

[3] EPA must also consult with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service if the approval would affect threatened or endangered species.

[4] *Alaska Clean Water Alliance v. Clark*, No. C96-1762R (W.D. Wash. July 8, 1997).

Importance of Accurate Water Quality Standards in Identifying Polluted Waters

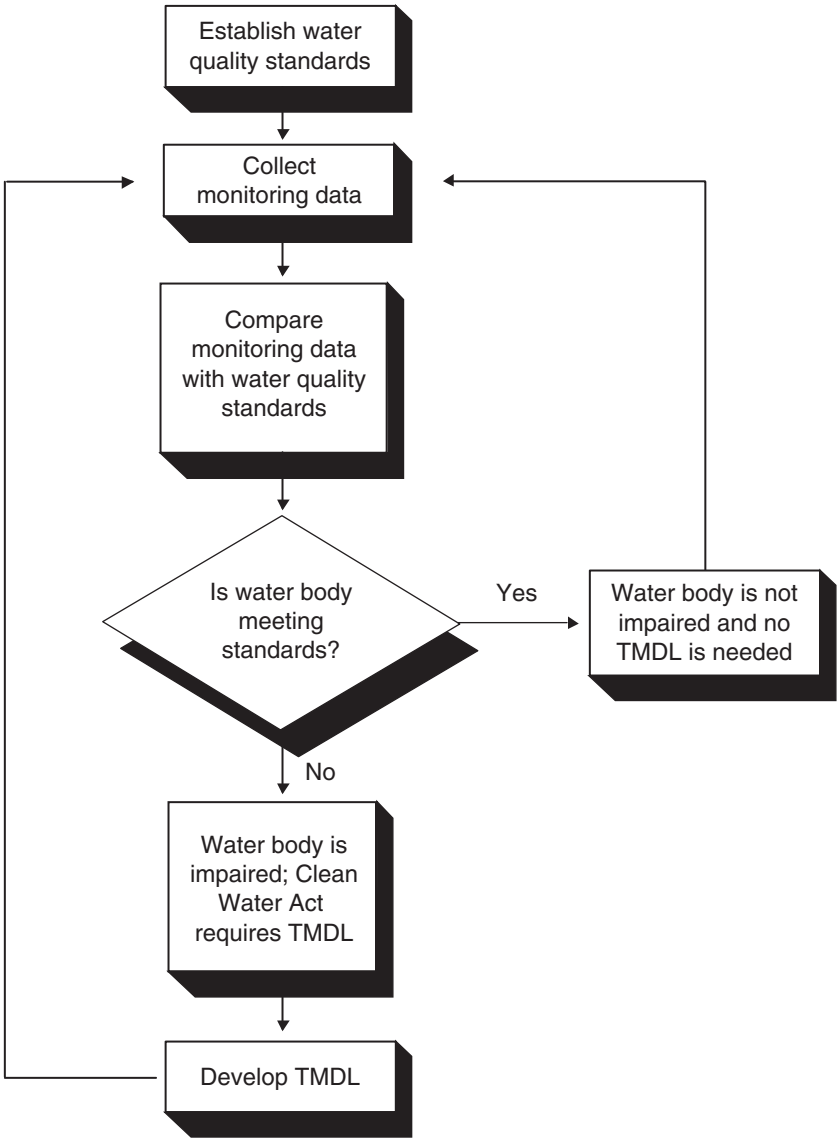
States use water quality standards as the benchmark against which they identify water quality problems caused by a variety of factors, such as improperly treated wastewater discharges; runoff or discharges from active or abandoned mining sites; sediment, fertilizers, and chemicals from agricultural areas; and erosion of stream banks caused by improper grazing practices. Water quality standards also support other programs aimed at achieving and maintaining protective water quality conditions. For example, water quality standards support (1) the National Pollution Discharge Elimination System (NPDES) program for point source discharges; (2) efforts that document current water quality conditions, including the list identifying impaired waters for which TMDLs are required; (3) water quality certifications for activities that may affect water quality and require a federal license or permit; and (4) management plans for the control of nonpoint sources of pollution.[5]

[5] Point source discharges include discrete discharges from individual facilities, such as factories and wastewater treatment plants. Nonpoint sources of pollution are diffuse sources that include a variety of land-based activities, such as timber harvesting, agriculture, and urban development.

Of perhaps greatest consequence in the past several years is the critical role that water quality standards play in determinations made in the TMDL program. As figure 3 illustrates, states' water quality standards play a key role in helping states identify which waters are in need of cleanup. States generally determine if a water body's designated use has been achieved by comparing monitoring data with applicable state water quality criteria. If the water body fails to meet the applicable standards, the state is required to list the water as impaired, calculate a pollution budget under the TMDL program that specifies what reductions are needed to achieve the standards, and eventually implement a cleanup plan. Because of this link between the water quality standards and TMDL programs, we and other organizations have identified concerns about the standards program. Our January 2002 report, *Water Quality: Inconsistent State Approaches Complicate Nation's Efforts to Identify Its Most Polluted Waters* (GAO-02-186), addressed, in part, inconsistencies among the states in assigning designated uses to water bodies as well as in developing criteria to protect those uses. In a similar vein, the National Academy of Sciences' National Research Council released a report in June 2001 that concluded, among other things, that standards are the foundation upon which the entire TMDL program rests, and states need to develop appropriate water quality standards prior to assessing water bodies and developing TMDLs.[6]

[6] National Research Council, *Assessing the TMDL Approach to Water Quality Management* (Washington, D.C.: National Academy Press, 2001).

Figure 3: Water Quality Standards as the Basis for Cleanup Decisions



Source: GAO.

Objectives, Scope, and Methodology

As agreed with the Chairman, Subcommittee on Water Resources and Environment, House Committee on Transportation and Infrastructure, the objectives of this review were to determine the extent to which (1) states are changing designated uses when necessary and EPA is assisting the states toward that end, and (2) EPA is updating its criteria documents and assisting states in establishing criteria that can be compared with reasonably obtainable monitoring data.

To obtain information on both objectives, we conducted a Web-based survey of water quality standards officials from the 50 states and the District of Columbia. Our survey asked state officials to provide information on the number of designated uses that have been changed in their state, as well as barriers officials face when making use changes. We also asked the officials to provide information on their state's water quality criteria needs and barriers they face when modifying criteria. We pretested our survey with state officials in Pennsylvania and Virginia and also obtained comments on the draft survey during a teleconference call with officials from 27 states and ASIWPCA. We received survey responses from all 50 states and the District of Columbia. We also provided our survey to five river basin commissions and received responses to the questions applicable to these organizations from three of those commissions.

To obtain EPA's perspective, we interviewed officials in EPA headquarters and EPA's 10 regional offices. During our interviews with officials from the regional offices, we asked the officials to provide information on program operations, policies, and guidance. We also obtained information on regional offices' interactions with the states during situations in which the state proposed to change designated uses and modify criteria.

To obtain more detailed information on the activities and limitations affecting state agencies' efforts to refine designated uses and establish appropriate criteria, we also visited water quality staff in three states—Kansas, Montana, and Ohio. In selecting these states, we considered a variety of factors, most notably their experiences in changing designated uses and establishing criteria and the diversity of their geophysical characteristics. In the states, we interviewed state water quality officials as well as representatives of industry and environmental groups. In addition, we accompanied Kansas water quality officials as they conducted a use attainability analysis and Ohio water quality officials as they demonstrated a biological assessment of a water body.

To obtain the perspective of the primary national organization representing state and interstate water quality officials, we interviewed members and staff of ASIWPCA. To obtain additional perspectives of key interest groups, we also interviewed representatives from the national offices of the American Farm Bureau Federation, the American Forest and Paper Association, and Earthjustice.

We conducted our work from February through December 2002 in accordance with generally accepted government auditing standards. GAO contacts and staff acknowledgments are listed in appendix IV.

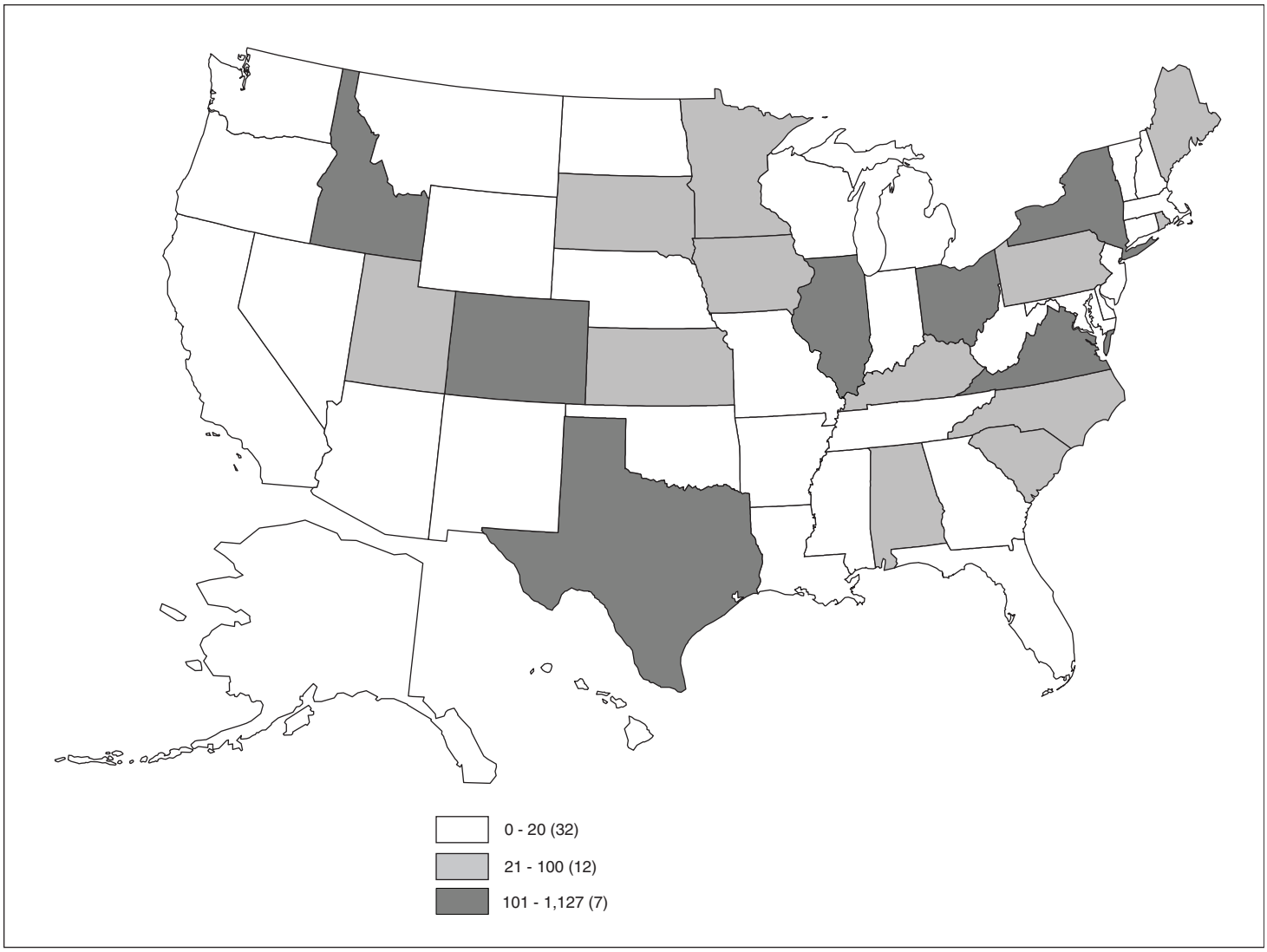
States' Practices in Changing Designated Uses Vary Widely

Appropriate designated uses are critical because they play a key role in states' determinations as to whether their waters are impaired and therefore need to be cleaned up. Nearly all states believe that some portion of their water bodies have over- or under-protective designated uses, or both. However, states vary considerably in the extent to which they have made changes to those designated uses. Nearly all states reported that they face barriers to making necessary changes to their designated uses, with many noting that a lack of resources and data limits the number of designated use changes they attempt. Compounding these problems is uncertainty states sometimes face about the circumstances in which use changes are acceptable to EPA and the evidence needed to support those changes. A key contributor to this uncertainty, in turn, is the absence of sufficient EPA guidance to help states understand when it is appropriate to pursue a designated use change and what data is required to successfully justify the change. Improved guidance would also help clarify for EPA's regional offices the circumstances under which state-proposed use changes should and should not be approved. Significantly, many states indicated that if improvements were made to the process of changing designated uses, so that they could more accurately assign those uses, they would likely identify different waters for cleanup under the TMDL program.

States Thus Far Report Wide Variation in the Extent to Which They Change Designated Uses

We asked the states to report the total number of designated use changes they adopted from 1997 through 2001. Their responses indicated that the extent to which states have made use changes varies widely. As figure 4 illustrates, 31 states and the District of Columbia reported that they made somewhere between no designated use changes to up to 20 use changes between 1997 and 2001, 12 states reported that they made between 21 and 100 use changes, and 7 states made between 101 and 1,127 use changes. Overall, the states identified approximately 3,900 use changes that were made during this period.

Figure 4: Number of Designated Use Changes Reported by Each State from 1997 through 2001



Source: GAO.

Notes: GAO analysis of state data.

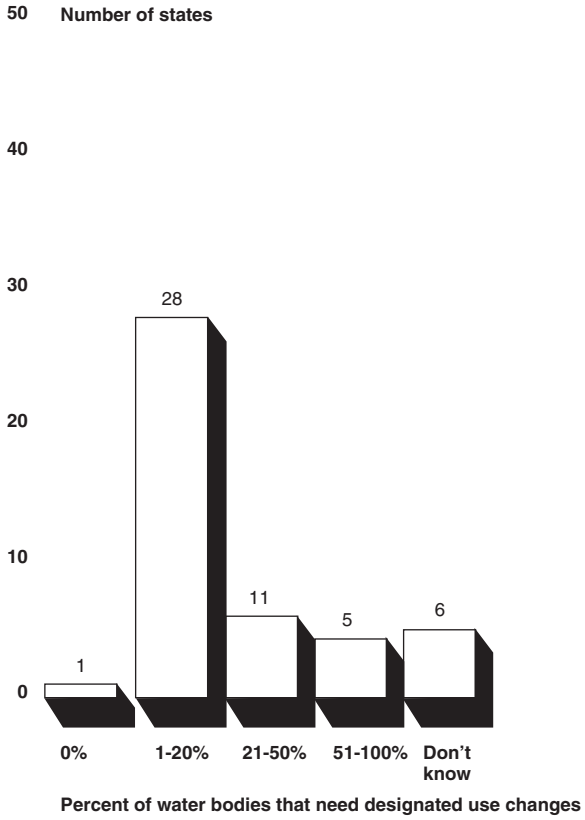
The designated use changes reported by the states include both changes that resulted in more protective uses and changes that resulted in less protective uses.

Future Use Changes May Dwarf Those Made to Date

Regardless of the number of use changes states have made to date, nearly all believe that future use changes are needed. As figure 5 illustrates, 28 states reported that between 1 to 20 percent of their water bodies need use changes, 11 states reported that between 21 and 50 percent of their water bodies need use changes, and 5 states reported that more than 50 percent of their water bodies need use changes. When examined more closely, these percentages indicate that future use changes may dwarf the few thousand made between 1997 and 2001. For example, Missouri's response noted that while the state did not make any use changes from 1997 through 2001, approximately 25 percent of the state's water bodies need changes to their recreational designated uses, and more changes might be needed for other use categories, as well. Similarly, Oregon's response noted that while no use changes were made from 1997 through 2001, the state needs designated use changes in more than 90 percent of its basins. The prospect of a significant increase in the number of designated use changes was also suggested by an internal 2000 EPA report assessing the water quality standards development and review process. In that report, EPA noted that the number of water quality standards submissions are expected to increase significantly, due in part to use designations reflecting more and better scientific information and greater focus on ecological factors.[1]

[1] EPA, *An Assessment of the Water Quality Standards Development and Review Process* (Washington, D.C.: October 2000).

Figure 5: Number of States Reporting Various Percentages of Their Water Bodies Needing Designated Use Changes



Source: GAO.

Note: GAO analysis of state data.

The expected increase in designated use changes to be proposed by many states is explained, in part, by how states originally designated the uses of their waters. Many state officials reported that, as a result of time constraints and a lack of data, their state set designated uses broadly. For example, Oregon's response explained that the state's designated uses were assigned very broadly by entire basin or subbasin, and most freshwaters are designated for all uses. Missouri's response explained that "Due to the paucity of data and time frame considerations [at the time uses were assigned]…" many of the state's waters are not appropriately designated. State water quality officials estimated that for recreational uses alone, 25 percent of the state's water bodies are misclassified. Utah's response

noted that because of concerns that grant funds would be withheld if designated uses were not assigned quickly, state water quality and wildlife officials set designated uses over a 4- to 5-day period using "best professional judgment."

In the same vein, many states found that as they collected more data in ensuing years, the new data provided compelling evidence that their uses were either under- or over-protective. In the case of over-protective designated uses, some states found, for example, that natural physical conditions unrelated to water quality (such as cover, flow, or depth) prevent attainment of the designated use. For example, as Kansas officials have collected additional data on their water bodies, they have identified instances where the attainment of a recreation use was not feasible due to natural physical conditions. They cited the example of Lohff Creek, which has naturally low flow conditions that prevent it from attaining its recreation use—a condition that state officials recognized only after they actually monitored the creek in 2001. Similarly, some states found that man-made hydrologic modifications, such as dams and diversions, sometimes prevent the attainment of a designated use and that in such instances it may not be feasible to restore or modify the water body. In other cases, naturally occurring pollutants, such as arsenic and mercury, prevent attainment of the designated use.

Conversely, some states reported that a portion of their designated uses were not protective enough. For example, water quality officials from Kansas explained that some of the water bodies in their state that have a designated use of secondary contact recreation (i.e., wading) should actually have a more protective primary contact recreation use (i.e., swimming) because the public has easy access to those water bodies. They cited the example of Huntress Creek, which flows through a city park, thereby allowing the public unhindered access. South Carolina's response noted that the state changed the designated uses of some of its water bodies to be more protective of trout waters and the outstanding resource waters of the state. Iowa's and Kentucky's responses noted that 96 and 87 percent, respectively, of their designated use changes made between 1997 and 2001 resulted in more protective uses. An Iowa water quality official explained that Iowa has been changing broad designated use categories into more specifically defined categories, and that these changes have resulted in many water bodies being assigned more protective uses.

In addition, some states have recognized a need to change designated uses based on interstate inconsistencies they identified. For example, a former

Kansas water quality official (currently with the Kansas Farm Bureau) explained that a part of the Missouri River that forms a portion of the state boundary between Kansas and Missouri has a primary recreation use in Kansas and a secondary recreation use in Missouri. Because of this discrepancy in the uses between the states, Missouri can allow discharges at levels such that the identical stretch of water is not impaired in Missouri but is impaired in Kansas. Similarly, the Salmon Falls River, an interstate water forming a portion of the boundary between Maine and New Hampshire, had inconsistent designated uses that resulted in an impairment designation by Maine but not by New Hampshire. Likewise, New York and Connecticut discovered that their dissolved oxygen standards for Long Island Sound (both designated uses and criteria) were inconsistent.

Some states are also seeking to develop more subcategories of designated uses to make them more precise and reflective of their waters' actual uses. Developing these subcategories of uses has the potential to result in more protective uses in some cases, and less protective uses in others. For example, Montana water quality officials noted that all streams with trout fall under the same use classification, but that not all trout have the same habitat requirements. The officials explained that without subcategories of uses, they cannot distinguish between high-quality, award-winning trout fisheries and lower-quality fisheries. Similarly, a representative from the Environmental Law and Policy Center of the Midwest explained that for water bodies that have a general designated use of fishing, the fish species present has sometimes changed over time due to increased pollution, yet the water bodies were still attaining their uses. On the contrary, states that currently have broadly defined designated uses that are protective of the most sensitive species might develop subcategories that are less protective for areas where those species are not present.

Citing circumstances such as these, the 2001 National Research Council report discussed earlier concluded that developing subcategories of designated uses is an essential step in setting appropriate water quality standards and that designated uses need to be more detailed than broad "recreational support" and "aquatic life support" categories. EPA has since developed a tiered aquatic life uses working group that has been tasked with developing guidance for creating aquatic life use subcategories.

Lack of Clear Guidance Complicates States' Efforts to Make Defensible Designated Use Changes

States have latitude under the Clean Water Act in determining whether their designated uses need to be changed. This latitude, along with different state philosophies, helps to explain, in part, their behavior thus far in making such changes. However, our survey shows that states have not made all of the use changes they believe are needed. According to the states, some reasons needed designated use changes have not been made include a lack of resources and monitoring data and resistance from interest groups and affected parties. Importantly, another key reason some of the needed use changes have not been made is states' uncertainty over the circumstances in which use changes are acceptable to EPA and the evidence needed to support these changes. EPA headquarters and regional officials acknowledge that states are uncertain about how to change their designated uses and believe better guidance would serve to alleviate some of the confusion.

Uncertainty Regarding UAAs

EPA regulations specify that in order to remove a designated use, states must provide a reason as to why a use change is needed and demonstrate to EPA that the current designated use is unattainable. To do this, states are required to conduct a UAA. According to EPA, a UAA is a structured, scientific assessment of the physical, chemical, biological, and economic factors affecting the attainment of a use. UAAs vary considerably in their scope and complexity and in the time and cost required to complete them. They can range from 15-minute evaluations that are recorded on a single worksheet to more complex analyses that might require years to complete. A Virginia water quality official explained, for example, that some of the state's UAAs are simple exercises using available data, while others require more detailed analysis involving site visits, monitoring, and lab work. In their responses to our survey, states reported that UAAs they conducted in the past 5 years cost anywhere from $100 to $300,000.

In 1994, as noted in chapter 1, EPA published guidance regarding use changes that specifies the reasons why states may remove a designated use.[2] Nonetheless, our survey shows that many states are still uncertain as to when to conduct UAAs, or about the type or amount of data they need to provide to EPA to justify their proposed use changes. Forty-three percent of states reported that they need additional clarifying UAA guidance. Among them, Oregon's response explained that water quality officials need

[2] *EPA Water Quality Standards Handbook*—Second Edition.

guidance on whether a UAA is required to add subcategories of use for particular fish species. Virginia's response indicated that the state needs guidance as to what reasons can justify recreational use changes, noting further that state water quality officials would like to see examples of UAAs conducted in other states. Louisiana's response similarly called for specific guidance on what type of and how much data are required for UAAs in order for EPA to approve a designated use change with less protective criteria.

To facilitate the process of making necessary use changes, as of summer 2001, 18 states had negotiated UAA protocols with their EPA regional offices to assist in achieving a common understanding of the information needed to justify a use change. Another 6 states were developing protocols at that time.[3] According to EPA officials, such protocols facilitate the UAA process by (1) standardizing data collection and analysis procedures, (2) outlining the bases on which the state evaluates the information, and (3) providing a consistent format and content for UAA results. Seventy-eight percent of the states with UAA protocols made designated use changes from 1997 to 2001, compared to 45 percent of the states without UAA protocols.

EPA Acknowledges State Uncertainty Regarding UAAs

EPA regional officials acknowledged the uncertainty states frequently experience regarding the scope, content, and other key attributes required for a given UAA. Officials from 9 of the 10 EPA regions reported that states need better guidance on when UAAs are needed and the data needed to justify a use change. Chicago regional officials, for example, explained that the states in their region need clarification on when recreational use changes are appropriate and the data needed to support recreational use changes. Similarly, an official from the San Francisco regional office reported that EPA needs to develop national UAA guidance that details how to conduct UAAs and suggested that headquarters provide a national clearinghouse of approved use changes to provide examples for states and regions of what is considered sufficient justification for a use change. In an EPA Office of Water draft strategy developed for the water quality standards program, EPA recognized that a clearinghouse for states and

[3] The 18 states with UAA protocols are Arkansas, Colorado, Idaho, Illinois, Iowa, Kansas, Louisiana, Maine, Minnesota, Nebraska, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas, Washington, Wisconsin, and Wyoming. The six states developing protocols as of summer 2001 were Hawaii, Indiana, Maryland, Missouri, Virginia, and West Virginia.

EPA to share information on policies, guidance, criteria, and implementation approaches would be useful to the states. The strategy specifies that EPA's Office of Science and Technology will conduct a feasibility study to identify ways to provide a cost-effective clearinghouse; EPA plans to conduct the feasibility study in 2004.

EPA headquarters officials have acknowledged states' need for additional UAA guidance and have formed a national UAA working group for this purpose. Tasked with developing draft guidance for categories of designated uses, the group plans to have draft guidance for recreational uses for public comment in late spring 2003 and to finalize the guidance by late summer 2003. EPA also intends to start drafting guidance for aquatic life uses in spring 2003, with draft guidance completed sometime in 2004.

EPA Regional Approaches Concerning States' Designated Use Changes Are Inconsistent

EPA's regional offices play an important role, both in assisting states in their efforts to ensure that their waters are properly designated and ultimately in either approving or disapproving proposed designated use changes. We found that regional assistance to the states varies but that much of this variation reflects the fact that some states request more assistance than others. Of greater concern to some states than the amount of assistance provided by EPA are the different "burdens of proof" applied by different regional offices as to when a UAA is needed and how much data is sufficient to justify a use change.

In response to a specific question posed in the letter requesting this study, we asked states about the extent of EPA assistance they have received in their efforts to evaluate designated uses for possible changes. Most of the states that have conducted UAAs characterized the level of assistance they received from their EPA regional offices as "minor," "very minor," or none at all. EPA officials explained that they provide assistance to states that are conducting UAAs when contacted by the states, and they encourage states to involve them in the process early and often. Officials from the Boston regional office noted that they have only received one request to assist with a UAA and that they worked hand in hand with the state when asked. Officials from the San Francisco regional office explained that it is important for states to contact EPA early in the process of conducting a UAA because EPA can help identify problem areas in advance. The officials noted that any time a state or regulated community member has conducted a UAA, they have come to the regional EPA office for assistance.

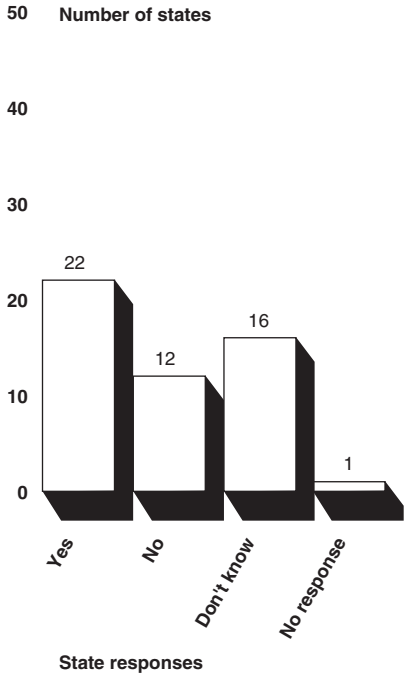
States' responses, however, cited a need for a different kind of assistance from EPA than guidance on how to conduct a UAA; rather, many said they would like a sense of predictability regarding the data they need to justify to EPA a designated use change. Some states' water quality officials reported that the data needed to justify a use change varies among EPA regions, and, in some regions, the requirements serve as a barrier to making use changes. Louisiana's response noted that the state would like EPA to agree on what type of and how much data are required in a UAA to substantiate a use change and added that it "would like to see the same 'rules' apply across EPA regions. In our experience, states in other regions are not subject to the same requirements for UAAs as we have been." Similarly, Iowa's response indicated that the approaches used to modify standards, including UAAs, vary considerably among the states and that EPA is often seen as an impediment to adopting better designated uses. Likewise, Rhode Island's response noted that EPA guidance on UAAs should be more uniformly applied by all the EPA regional offices and explained that the state's most significant concern is that its EPA regional staff require a much greater burden of proof than EPA guidance suggests or than other regions require.

Existing EPA guidance recognizes that some inconsistency in the amount and type of data required to justify a use change is legitimate given that UAAs vary in scope and complexity. Some EPA headquarters and regional officials, however, acknowledge inconsistency among the regions, based on varying interpretations of the regulations, in the type and amount of data they require of states making use changes. One EPA regional official expressed the view that the 10 regions have 10 different interpretations of when a UAA is appropriate and what data are needed to justify a use change. The official further explained that national UAA guidance that provides decision criteria is needed so that there can be greater consistency in use change decisions across regions. Water officials from several other regions also acknowledged the inconsistency and explained that the inconsistency is due to the lack of national guidance. EPA headquarters officials concurred that regional offices require different types and amounts of data to justify a use change and noted that inconsistency in EPA regional approaches has been a long-standing concern. The officials explained that EPA is trying to reduce inconsistencies while maintaining the flexibility needed to meet region-specific conditions by holding regular work group meetings and conference calls between the regional offices and headquarters.

Different Water Bodies Would Be Slated for Cleanup If Improvements Were Made

Appropriate designated uses play a key role in states' determinations of impaired water bodies. Without them, states cannot make well-informed cleanup decisions under the TMDL program, and states risk focusing resources on the wrong water bodies and/or exposing their citizens to health and environmental risks. Given the barriers to changing designated uses that states face, some EPA regional officials reported that some states are opting to develop "bad" TMDLs rather than make needed use changes. Some states believe that if the process of changing designated uses were improved, it would result in better decisions as to which water bodies need to be cleaned up. As figure 6 illustrates, 22 states reported that they believe different water bodies would be identified for TMDL development in their states, while another 16 reported that they did not know whether different water bodies would be slated for TMDL development. Rhode Island's response, for example, noted that if the process of changing uses were improved, waters impaired by natural causes would no longer be targeted for TMDL development. Nebraska's response indicated that if the state were able to refine recreational uses to exclude high flow events, many of its waters slated for cleanup would no longer require TMDLs.

Figure 6: States' Responses to Whether Different Water Bodies Would Be Slated for Cleanup if the Process for Changing Designated Uses Were Improved



Source: GAO.

Note: GAO analysis of state data.

Many of the regional EPA officials we interviewed agreed with this assessment. Overall, officials from 7 of 10 regional EPA offices reported that different water bodies would probably be identified as requiring TMDLs if the process of changing designated uses were improved.[4] One regional official reflected the views of others in explaining that while some additional water bodies presently not listed as impaired would be identified as requiring a TMDL, others currently listed as impaired might be subsequently delisted.

[4] Officials from the other three regional offices indicated that they did not know whether different water bodies would require TMDLs.

Conclusions

The accuracy of designated uses is critically important, given their central role in determining whether or not waters are to be targeted for cleanup. Inaccurately identified uses may result in either wasted resources caused by the "overprotecting" of some waters, or unacceptable environmental consequences caused by the "underprotecting" of others.

Many thousands of waters nationwide are currently assigned designated uses that state water quality officials believe are inappropriate. However, based on the states' relatively limited experience to date in making use changes, the challenge of evaluating this much larger number of waters for future changes will be particularly complicated.

As they approach this task, both states and their EPA regional offices would benefit from additional guidance that clarifies the circumstances in which designated use changes are appropriate and the type and amount of data a state needs to justify such a change to EPA. Indeed, the states and regions that have developed protocols for this purpose have, as a group, been better able to agree upon such changes than those without protocols. EPA officials acknowledge the value of designated use protocols. They also acknowledge that clearer national guidance would serve a similar purpose and, at the same time, provide a more consistent framework for use changes among states and regions.

EPA has plans to explore the feasibility of establishing a clearinghouse that provides states and regional offices with examples of approved use changes and the justification for those changes. A clearinghouse would also allow EPA and the states to share information on policies, guidance, criteria, and implementation approaches. EPA officials said they are currently planning to conduct the feasibility study in 2004 to identify cost-effective ways to provide this clearinghouse.

Recommendations

To help ensure that the designated uses in place under EPA's water quality standards program provide a valid basis for decisions on which of the nation's waters should be targeted for cleanup, we recommend that the Administrator of EPA

- provide additional guidance on designated use changes to better clarify for the states and regional offices when a use change is appropriate, what data are needed to justify the change, and how to establish subcategories of uses; and

- follow through on the agency's plans to assess the feasibility of establishing a clearinghouse of approved designated use changes by 2004.

Agency Comments and Our Evaluation

EPA shares our concern that waters are inappropriately slated for TMDL development as a result of inappropriate use designations. The agency notes that it intends to provide guidance to states on how to change their uses so that states can establish a more refined set of uses that will better characterize the states' water quality goals for specific waters. The agency also notes, however, that current designated uses are not necessarily "incorrect," explaining that waters may be listed as impaired inappropriately because the designated uses applying to those waters are not specific enough. We agree with EPA that some of the waters inappropriately slated for TMDL development are the result of designated uses that are not specific enough and need further refinement. However, some state water quality officials also told us that some waters are listed inappropriately because the designated uses were, in fact, incorrect. For example, a number of state officials explained that some waters are listed inappropriately because the designated uses are simply inconsistent with the waters' conditions.

EPA points out that, like the non-EPA related barriers to making necessary criteria changes cited in chapter 3, similar barriers apply to the designated uses discussion in chapter 2. Specifically, EPA's letter cites "burdensome state rulemaking processes, public opposition to downgrades, and resource shortages that make it difficult for states to invest in necessary monitoring and assessment programs." While the draft report had acknowledged several of these non-EPA barriers (e.g., scarcity of resources and monitoring data and resistance from interest groups and affected parties) in its executive summary, we have added these barriers in chapter 2.

States Need Criteria for Some Pollutants and Assistance in Applying and Modifying Existing Criteria

Because water quality criteria are the measures by which states determine if designated uses are being attained, they play a role as important as designated uses in states' decisions regarding the identification and cleanup of impaired waters. If nationally recommended criteria do not exist for key pollutants or if states have difficulty using or modifying existing criteria, states may not be able to accurately identify water bodies that are not attaining designated uses. Therefore, EPA is required to periodically publish and revise criteria documents that contain the technical data that help the states adopt pollutant thresholds.

As required, EPA has developed and published criteria for a wide range of pollutants. According to EPA data, however, a relatively large share of pollutants causing water quality problems nationwide are pollutants for which EPA either has not yet developed national numeric criteria (e.g., sedimentation and other nonpoint source pollutants) or is in the process of developing numeric criteria (e.g., nutrients). In addition, (1) many states have had difficulty using EPA's criteria documents to establish state water quality criteria that can be compared with reasonably obtainable monitoring data and (2) most states have difficulty modifying the criteria they already have in place to better meet their needs or reflect new information. As was the case with designated uses discussed in the previous chapter, many states reported that if the process of making necessary changes to criteria were improved, different waters would be slated for cleanup.

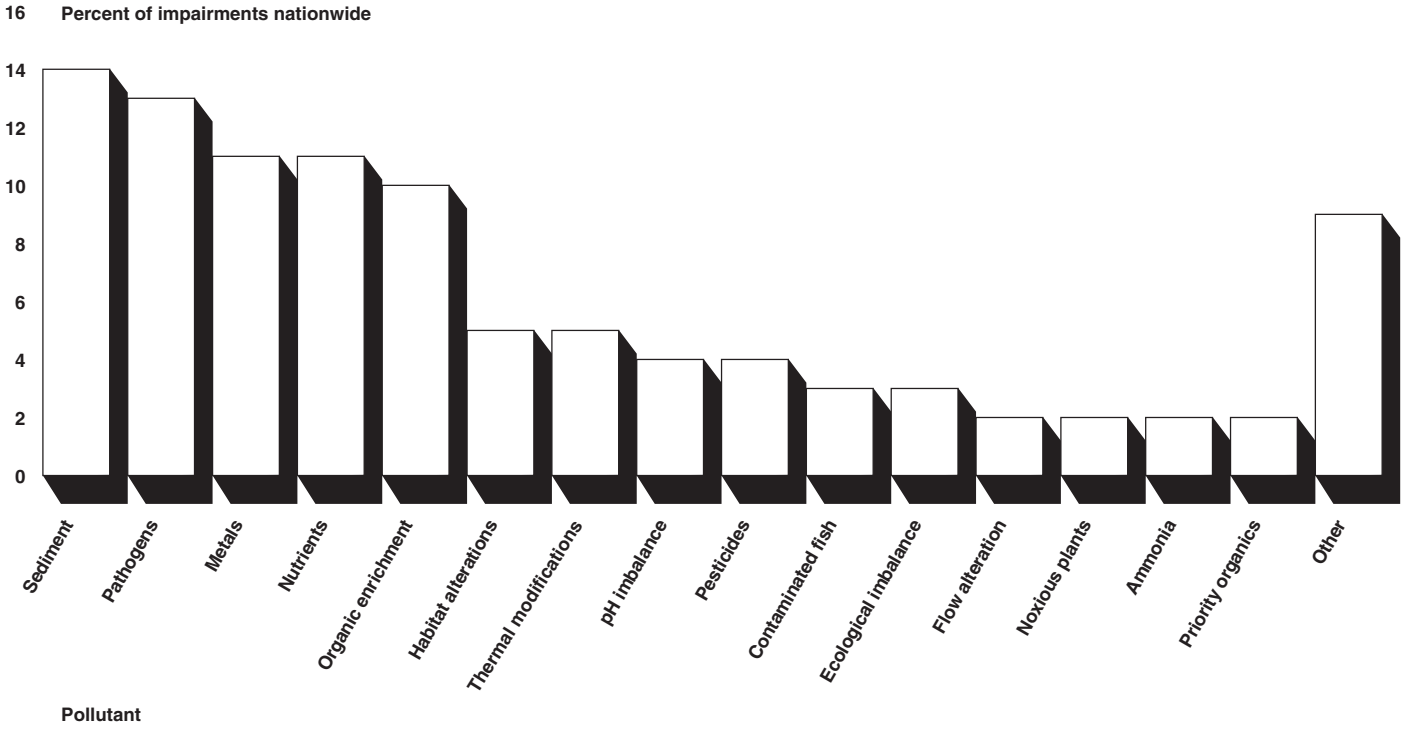
Key Criteria Documents Have Not Been Developed by EPA

Under the Clean Water Act, EPA is required to develop and publish, and from time to time revise, water quality criteria that accurately reflect the latest scientific knowledge. As of May 2002, EPA had issued national numeric criteria for 165 pollutants, of which 101 are for priority toxic pollutants.[1] Yet as large as this number of pollutants may be, approximately 50 percent of water quality impairments nationwide concern pollutants for which there are no national numeric water quality criteria. Sedimentation is a key pollutant for which numeric water quality criteria need to be developed. In addition, nutrient criteria are currently being developed, and pathogen criteria need to be revised. Together, sediments, nutrients, and pathogens are responsible for about 40 percent of impairments nationwide. (See fig. 7.) Many states responding to our survey indicated that these

[1] The Clean Water Act includes specific requirements for priority toxic pollutants, which are known to be toxic at low levels.

pollutants are among those for which numeric criteria are most needed. Specifically, when asked to identify the top three such pollutants, the pollutants most frequently cited were nutrients, followed by sediment and pathogens.

Figure 7: Percent of Impairments Nationwide Caused by Various Pollutants



Source: GAO.

Note: GAO analysis of EPA data.

Recognizing the growing importance of pathogens in accounting for the nation's impaired waters, EPA developed numeric criteria for pathogens in 1986—although states are having difficulty using these criteria and are awaiting additional EPA guidance. EPA is also currently working with states to develop nutrient criteria and has entered into a research phase for sedimentation. The agency is asking states to make "substantial progress" in adopting nutrient criteria by the end of 2004. EPA issued guidance in January 2001 to help the regions and states do this. While EPA has published final "eco-regional" nutrient criteria recommendations for all

freshwaters, excluding wetlands, some state water quality officials told us of continuing concerns over their ability to adapt the recommended numeric nutrient criteria to take into account local watershed conditions. If the recommended criteria are not adapted, some states expressed concern that the criteria may not be realistic for state implementation. For example, a water quality official from Iowa explained that the discussion in his region has thus far been dominated by individuals who will not be responsible for actually using the criteria and that the criteria suggested appear to represent ideal conditions. Water quality officials from Illinois and Kentucky also expressed concern with the current nutrient criteria, noting that eco-regions are too broad in scope and that criteria will need to be adapted by the states to be meaningful.

EPA has made substantially less progress in developing sedimentation criteria. The agency plans to have a strategy for developing sedimentation criteria by September 2003. At that point, EPA officials plan to consult with their Science Advisory Board regarding the strategy. As of January 2003, the agency does not have a prospective date for developing sedimentation criteria. EPA noted that in the past the agency has issued several technical papers and provided some guidance to states regarding sedimentation.

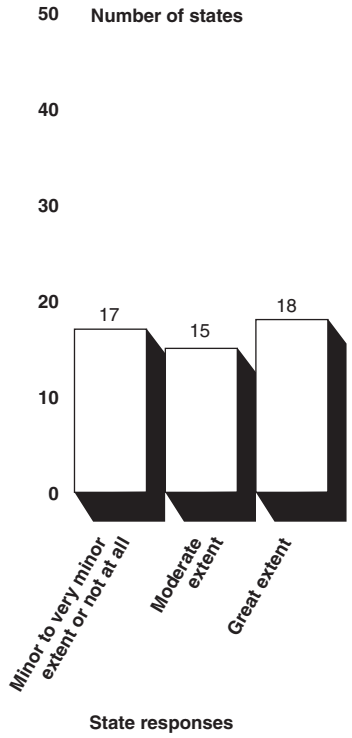
EPA explained that the delay in developing and publishing key criteria has been due to various factors, such as the complexity of the criteria and the need for careful scientific analysis, as well as an essentially flat budget accompanied by a sharply increased workload. In response to our request for specific budget data, the officials noted that since 1992 the water quality standards budget has fluctuated between $16.2 and $20.3 million, with the fiscal year 2002 budget at approximately $18.8 million. (See app. I.) During the same time, EPA officials noted that their workloads have increased because of several external factors, including increased litigation and new legislative requirements. For example, as of August 2002, EPA had 11 pending cases and nine notices of intent to file suit that affect the water quality standards program. The officials also explained that for several decades EPA and the states focused more on point source discharges of pollution, which can be regulated easily through permits, than on nonpoint sources, which are more difficult to regulate. In recent years, as nonpoint sources of pollution have become more of a priority, there has been an increasing focus on pollutants from such sources.

Many States Cannot Reasonably Monitor to Determine if Criteria Are Being Met

Even in cases where criteria have been published by EPA, states reported that the criteria cannot always be effectively used because water quality officials sometimes cannot perform the kind of monitoring, as specified in the criteria documents, that must be used to ascertain whether the water body is meeting standards. While most states face long-standing challenges in collecting a sufficient amount of monitoring data to assess all of their water bodies, states reported that some criteria cannot be used even when reasonably obtainable monitoring data is collected. These findings confirm those of the 2001 National Research Council report cited earlier, which underscored the importance of criteria that can be reasonably compared with monitoring data but which also found that criteria often lack this key characteristic.

Our survey asked states to report on the extent to which they have been able to establish criteria that they can use to determine whether their water bodies are attaining their designated uses. As figure 8 shows, about one-third reported that they were able to do so to a "minor" extent or less, about one-third to a "moderate" extent, and about one-third to a "great" extent. Some states explained that the required frequency of monitoring posed a problem. For example, while Connecticut was one of the states that reported that it has been able to establish its criteria in this way to a "moderate" extent, its response also explained that some criteria include "never exceed" values that suggest the need for continuous monitoring—a monitoring regimen that requires resources the state "simply does not have." Similarly, Mississippi's response noted that the state has adopted some water quality criteria that specify that samples must be collected on four consecutive days. The response noted, however, that the state's monitoring and assessment resources are simply insufficient to monitor at that frequency.

Figure 8: States' Responses on the Extent to Which Their Criteria Can Be Used to Determine Whether Their Water Bodies Are Impaired



Source: GAO.

Note: GAO analysis of state data.

Some EPA regional officials said they generally understand the states' concerns and suggested that EPA should assist states by developing scientifically defensible methods for implementing criteria that account for monitoring constraints. Regional officials in Boston explained that they are currently assisting the states in their region to use probabilistic sampling techniques for assessing many water bodies. Similarly, Chicago and Dallas regional officials suggested the use of a random sample approach to identify and prioritize impaired waters. San Francisco regional officials recognized that technology has not always kept pace with states' monitoring needs, and thus they have promoted a "weight of evidence" approach to making impairment decisions in which chemical, toxicity, and biological data are assessed collectively, rather than independently, to determine the overall state of the water body. New York regional officials stated that national EPA guidance for criteria implementation is needed

because states will not use criteria unless they have a clear understanding of how to implement them.

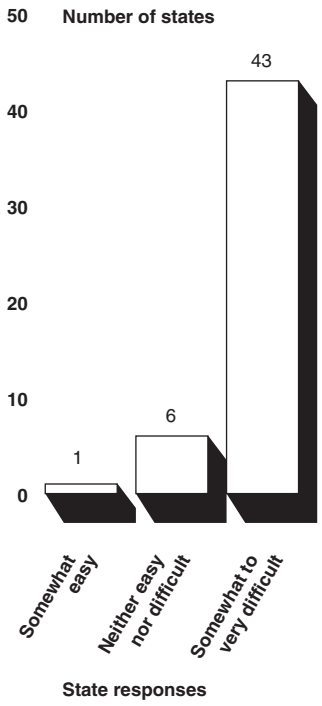
The National Research Council's 2001 report underscored the importance of having water quality standards that can be compared to reasonably obtainable monitoring data, but echoed the concerns of many states that standards too often lack this key characteristic. The report explained that "In many states, there is a fundamental discrepancy between the criteria that have been chosen to determine whether a water body is achieving its designated use and the frequency with which water quality data are collected." The report further noted that compliance with some criteria is virtually impossible, leading to complications within the TMDL program.

States Report Difficulty in Modifying Criteria

If a state believes that it can improve its criteria, it has the option of modifying them—with EPA's approval. In fact, states are required to review and modify their criteria periodically—a process involving activities from data collection and assessment through EPA approval or disapproval. A state might modify a criterion, for example, if new information becomes available that better reflects local variations in pollutant chemistry and corresponding biological effects, or because newer and more direct measures of designated use protection are identified.

As figure 9 illustrates, 43 states responded that it was "somewhat" to "very" difficult to modify criteria. Not surprisingly, a vast majority of states reported that a lack of resources (including funding, data, and staff expertise) complicates this task. Nevada's response, for example, explained that, like many states, it typically relies on EPA's recommended criteria because of limited experience in developing criteria as well as limited resources; in many instances, developing site-specific criteria would better reflect unique conditions, allowing for better protection of designated uses. Ohio's response cited the need to use a formal rulemaking process, which can be both time- and resource-intensive.

Figure 9: States Reporting the Ease or Difficulty of Modifying Water Quality Criteria



Source: GAO.

Note: GAO analysis of state data.

Many states also said that concern over the public's perception of a proposal to modify criteria affects their ability and inclination to do so. States receive comments concerning proposed changes from a wide range of interested parties, from the regulated community (e.g., the American Farm Bureau, power companies, and wastewater treatment plants) to the environmental community and other citizen groups. As Wisconsin's response noted, resistance to criteria changes tends to come from whichever side believes its interests are adversely affected—the regulated community in cases where the proposed criteria become more stringent and the environmental community when they become less stringent. On the other hand, Ohio water quality officials, as well as members of environmental organizations and the regulated community, noted that their state officials' use of science to justify criteria changes makes agreement between the state and the public more likely. Members of the regulated community have been able to use the state's methodology for making

criteria changes in order to initiate some criteria changes and provide the data to justify those changes. Likewise, members of a state environmental organization noted that they support the state's methodology because it is science-based and allows for greater objectivity in decision making.

Uncertainty over EPA approval process a key barrier

While it is not surprising that most states cited resource shortages and the public's response as factors that affect their ability to modify criteria, more than half the states also reported that the EPA approval process is a factor. Some states noted that the EPA approval process leaves them unclear as to whether a resource-intensive criteria modification process may be worth pursuing. States also noted differences among the EPA regional offices and with EPA's headquarters office as to what they will accept as "reasonable proof" to justify a criteria modification. Kansas officials explained that EPA headquarters officials state there is a great deal of flexibility afforded to states in developing their individual state water quality standards, but EPA regional officials appear more reluctant to allow states to utilize that flexibility. State officials postulated that because of staff turnover, regional staff are not there long enough to have much confidence as to what is reasonable. A Kansas Farm Bureau employee who formerly worked for the Kansas Department of Health and Environment asserted that Region 7 officials were far less experienced than Region 8 officials and that it was therefore much more difficult to negotiate criteria changes with Region 7 staff.

Some EPA regional and headquarters officials acknowledge that a lack of staff expertise has sometimes had an effect on criteria modification decisions. One regional EPA official told GAO that regional staff tenure and experience has affected how easily states are able to modify their criteria. In addition, a recent report by EPA's Office of Science and Technology acknowledged the staff turnover issue and its effects.[2] The report notes that high staff turnover at headquarters as well as in the regions has, at times, resulted in inexperienced staff being placed in positions of authority over water quality standards decisions. The report further notes that these staff sometimes lack the technical competency to work with the states on determining the "scientific feasibility" of state criteria modifications. While the report adds that EPA is implementing 2000 guidelines for national

[2] EPA, *An Assessment of the Water Quality Standards Development and Review Process* (Washington, D.C.: October 2000).

coordination on reviewing state water quality standards actions, states continue to report inconsistencies.

Regional officials have acknowledged this report's conclusion that states' uncertainty over what constitutes an approvable modification has sometimes complicated their efforts to modify their criteria. An official from the San Francisco regional office noted that states do not know what data they need to provide to justify a criteria modification or when their region will approve a criteria modification. The official explained that a southern California group of dischargers spent $1.5 million to provide supporting data for a standards change to the regional EPA office. The proposed change was ultimately not approved, and the sponsors believed that a clear reason for the disapproval was not provided.

Officials from EPA's Office of Science and Technology told us that EPA has intentionally not issued specific guidance on what constitutes an approvable criteria modification. The officials explained that EPA does not want to preclude options that states may use to modify their criteria if the states can demonstrate protectiveness and scientific defensibility of the proposed criteria. The officials noted that EPA regional and headquarters staff are available to assist states that wish to pursue modifications of their criteria. We acknowledge the merits of EPA's strategy of allowing the states the flexibility to pursue different options. Our findings, however, suggest that additional headquarters guidance and training of its regional water quality standards staff would still help to facilitate meritorious criteria modifications—particularly in situations where relatively less experienced standards officials have hesitated to consider proposed modifications largely because they would come under the scrutiny of the regulated and/or environmental communities.

Improving Criteria Would Result in Different Waters Being Slated for Cleanup

States' abilities to modify criteria can significantly affect the way they identify their impaired waters and, consequently, the decisions they make as to which of their waters should be targeted for cleanup under the TMDL program. When asked if an improvement in the criteria modification process would result in different waters being slated for TMDL development, 22 states responded yes, 19 states said they did not know, and 10 states said no. Idaho, Rhode Island, South Carolina, and Wyoming responded that improved criteria would probably result in fewer waters being listed as impaired. Rhode Island and South Carolina said that such criteria could better reflect site-specific conditions in their states. Oregon's response noted that an improvement in the criteria modification process

could lead to more or fewer water bodies identified as impaired, depending on what criteria are modified and how they are modified.

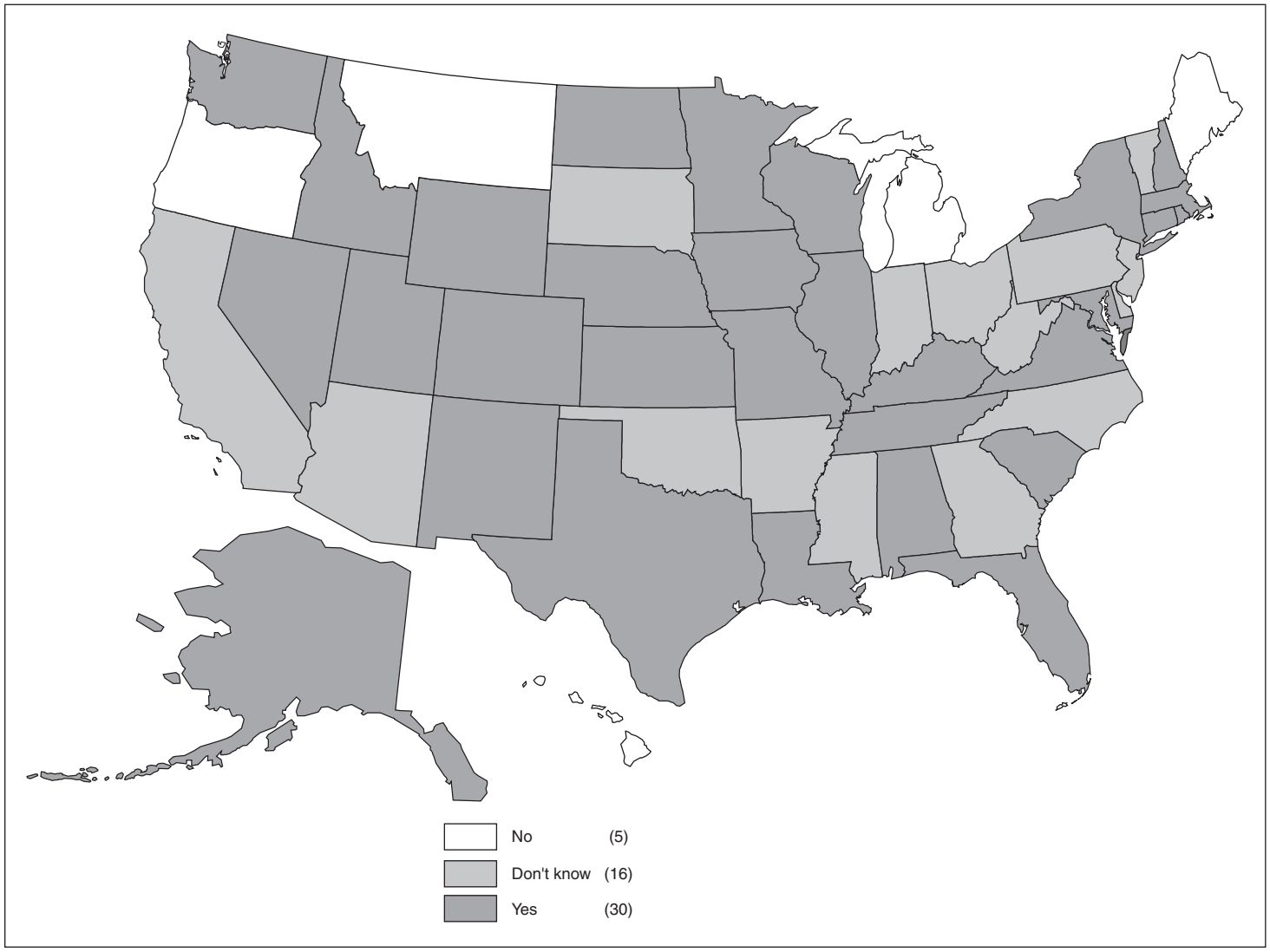
Additional Impacts Expected from Upcoming New Criteria on Nonpoint Source Pollutants

In addition to states identifying different waters as impaired due to their modification of existing criteria, states would also identify different waters as impaired as a result of new nonpoint source pollutant criteria—particularly nutrients and sedimentation. These criteria will likely lead to increases in the number of impaired waters listed by some states, particularly agricultural states. Kansas water quality officials explained, for example, that if Kansas adopts the nutrient criteria without adapting them for local conditions, more than 90 percent of the state's lakes and reservoirs—284 of approximately 315 lakes and reservoirs—would need to be listed as impaired by nutrients. Regardless of whether states experience an increase, decrease, or no change in the number of waters identified as impaired due to new criteria, the more important point is that states will be identifying different waters as impaired.

Potentially Large Cumulative Impact of Both Designated Uses and Criteria on Impaired Waters Lists

Because designated uses and criteria make up states' water quality standards, a change in either one is considered a standards modification. As noted in chapter 2, 22 states reported that an improvement in the process of changing designated uses would result in different water bodies being slated for cleanup. Further, as noted in this chapter, 22 states reported that an improvement in the process of modifying criteria would have that effect. When we superimpose the states' responses to obtain the cumulative effect of improving either designated uses or the process of criteria modification, we found that a total of 30 states indicated that an improvement in the process of modifying standards—whether a change in their designated uses, their criteria, or both—would result in different water bodies being slated for cleanup. (See fig. 10.)

Figure 10: States Reporting That Different Water Bodies Would Be Slated for Cleanup if Improvements Were Made to the Process of Changing Standards



Source: GAO.

Note: GAO analysis of state data.

Importantly, the 30-state total does not reflect the impacts that would result from EPA's publication, and states' subsequent adoption, of new criteria for sedimentation and other pollutants and states' adoption of new nutrient criteria. As this occurs in coming years, states will adopt numeric criteria for these key pollutants which, in turn, will likely lead many of them to identify different waters as impaired.

Conclusions

Because water quality criteria are the measures by which states determine if designated uses are being attained, they play an equally important role with designated uses in identifying impaired waters for cleanup. Several problems, however, impede the use of criteria for this purpose. Specifically, (1) EPA has not developed many of the criteria for identifying the key nonpoint source pollutants that cause the largest share of the nation's water quality impairments, (2) even when EPA has developed criteria recommendations, some states have often had difficulties using the criteria in such a way that they can reasonably determine if the criteria are being met, and (3) most states have difficulty modifying the criteria that they already have in place.

EPA has developed and published criteria for a wide range of pollutants over a period of decades, but has not yet issued numeric water quality criteria recommendations for key nonpoint source pollutants that together cause approximately 50 percent of water quality impairments nationwide. The agency has taken significant steps toward the complex task of developing nutrient criteria, and states are currently trying to adapt default nutrient criteria provided by EPA to reflect local conditions. However, EPA has made substantially less progress to date in developing criteria for sedimentation, another top priority pollutant, and has yet to identify a target date for its completion.

In cases where EPA has developed criteria recommendations, states have often had difficulties using the criteria in such a way that they can reasonably determine if the criteria are being met. Some difficulties in using the criteria stem, for example, from states' inability to reasonably monitor at the frequency needed. While a lack of resources for monitoring has been a long-standing concern at the state level, some EPA regional officials have noted that there may be alternative, scientifically defensible monitoring strategies that could better help them determine whether water bodies are meeting their criteria.

Even though states are required to review and modify their existing criteria periodically, most states have a difficult time making needed changes. While most states said that they sometimes lack the resources needed to modify their criteria, more than half of the states also reported that EPA's approval process is a barrier they face when trying to modify their criteria. Many noted that EPA regional officials are inconsistent in the types and amount of data they deem sufficient to justify a criteria change. This inconsistency can be explained, at least in part, by staff turnover in the regional offices, particularly in situations where relatively less experienced standards officials have hesitated to consider proposed modifications. Additional headquarters guidance and training of its regional water quality standards staff would help facilitate meritorious criteria modifications while protecting against modifications that would result in environmental harm.

Recommendations

We recommend that the Administrator of EPA take actions to improve states' abilities to adopt, implement, and modify water quality criteria. Specifically, the Administrator should direct the Office of Science and Technology to do the following to help ensure that states' criteria are a valid basis for impairment decisions:

- Set a time frame for developing and publishing nationally recommended sedimentation criteria.
- Develop alternative, scientifically defensible monitoring strategies that states can use to determine if water bodies are meeting their water quality criteria.
- Develop guidance and a training strategy that will help EPA regional staff determine the scientific defensibility of proposed criteria modifications.

Agency Comments and Our Evaluation

EPA states that the report should further emphasize the significant progress the agency has made in developing criteria for nutrients and sedimentation. EPA notes, for example, that the agency has published final nutrient criteria recommendations for all freshwaters (except wetlands) in the contiguous United States and that EPA is currently working on nutrient criteria recommendations for wetlands. The agency also underscored its initial efforts to develop sedimentation criteria. The draft report had cited

EPA's significant efforts to develop nutrient criteria, noting, for example, that EPA issued guidance in January 2001 to assist the regions and states develop "eco-regional" numeric nutrient criteria that would take into account local watershed conditions. The draft also cited EPA's plans to have a strategy for developing sedimentation criteria by September 2003 and after that, consult with its Science Advisory Board regarding the strategy. However, in response to the EPA comment, we have added an expanded explanation of the current status of EPA actions to develop nutrient and sedimentation criteria in chapter 3.

EPA questions the draft report's prediction that new criteria for nutrients, sedimentation, and other pollutants would lead to large increases in the numbers of waters listed as impaired. EPA points out that it may be difficult to predict the effect of the new criteria for various reasons. For example, EPA notes that depending on how states prepared their previous lists of impaired waters, some waters may be taken off the list while others are added. In addition, EPA explains that new quantitative criteria for nutrients or sedimentation may help refine impaired waters lists because many states would have numeric benchmarks as opposed to narrative criteria or qualitative assessments. We acknowledge EPA's assessment that the nationwide effect of new criteria may be unclear. However, water quality experts from a number of individual states told us that they expect large increases in their numbers of impaired waters from the new nutrient criteria alone. Nonetheless, whether the new criteria result in an increase, decrease, or no change in the number of waters listed as impaired nationwide, the important point is that the issuance of these criteria will result in different listings in the case of many waters. In response to EPA's comment, we revised the report to emphasize the key point that states will identify different waters as impaired, rather than more or fewer waters.

EPA states that the draft report did not sufficiently recognize the progress EPA has made in addressing states' concerns about developing and adopting nutrient criteria. The agency notes that in response to states' concerns that EPA's nutrient criteria recommendations may not be appropriate for specific waters, the agency issued a November 2001 guidance memorandum. EPA explains that the guidance memorandum clarifies that states have the flexibility to adopt EPA's recommendations, adapt the recommendations to better reflect local conditions, or develop nutrient criteria using other scientifically defensible methods. We acknowledge the value of EPA's November 2001 guidance but note that some state representatives told us of continuing concerns, despite the guidance, over their ability to adopt, adapt, or develop nutrient criteria.

For example, some state representatives reported that their states will need to adapt EPA recommended nutrient criteria to reflect local conditions but will have difficulty collecting adequate data to do so.

EPA's Water Quality Standards Program Budget from 1992 through 2002

EPA provided its best available budget amounts for the water quality standards program from 1992 through 2002. As table 1 indicates, the nominal dollar budget amounts for the program ranged between approximately $16.2 and $20.3 million during that time.

Table 1: EPA Water Quality Standards Program Budget Amounts from 1992 through 2002

Fiscal Year	Dollars in millions
1992	$16.2
1993	$16.7
1994	$18.9
1995	$18.6[a]
1996	$18.4[b]
1997	$19.9[a]
1998	$20.3[c]
1999	$19.1[a]
2000	$18.5[a]
2001	$18.4[a]
2002	$18.8[a]

Source: EPA.

[a]Enacted budget amount

[b]Operations plan budget amount

[c]Presidential budget amount

GAO Survey of State Water Quality Standards Programs

Survey of State Water Quality Standards Programs

U.S. General Accounting Office

Designated Uses

We would like to obtain information about the way states originally assigned their designated uses for their water bodies. Your responses to the following set of questions will provide perspective about how states set designated uses as well as their current status.

1. While we are aware that at least some states had designated uses in place prior to the Clean Water Act of 1972, we are interested in finding out when states set designated uses in response to the Act. In what year(s) did your state assign designated uses based on the Clean Water Act for your states' water bodies?

2. How were those designated uses assigned in your state?

3. Based on what you know now, do you believe that those designated uses assigned in your state were reasonable?
(PLEASE CHECK ONLY ONE ANSWER)

   1. ☐ Yes
   2. ☐ No
   3. ☐ Partially
   4. ☐ Don't know

Please explain your answer to Question 3:

1

4. In your opinion, what percentage of the water bodies in your state need a refinement (i.e. any change) of their current designated uses?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ 1-10 %
2. ☐ 11-20 %
3. ☐ 21-30 %
4. ☐ 31-40 %
5. ☐ 41-50 %
6. ☐ 51-60 %
7. ☐ 61-70 %
8. ☐ 71-80 %
9. ☐ 81-90 %
10. ☐ 91-100 %
11. ☐ None need to be refined
12. ☐ Don't know

5. What are the two most frequent reasons you believe designated uses of water bodies in your state need to be refined?
(PLEASE CHECK ONLY TWO)

1. ☐ Naturally occurring pollutants prevent attainment
2. ☐ Natural water levels prevent attainment
3. ☐ Human conditions that cannot be remedied or would cause more environmental damage to correct prevent attainability
4. ☐ Hydrologic modifications prevent attainment and it is not feasible to restore or modify
5. ☐ Natural physical conditions unrelated to water quality (like cover, flow, depth, etc.) prevent attainment
6. ☐ Attainment would result in substantial and widespread economic and social impact
7. ☐ Other reason(s) (please specify in text box below)

If you answered "Other reason(s)" in Question 5, please specify the reason:

2

Numbers of Use Changes and Use Attainability Analyses (UAAs)

According to EPA, a UAA is a structured scientific assessment of the factors affecting the attainment of a use which may include physical, chemical, biological, and economic factors.

Note: You may have to gather some information before you can respond to questions 6 and 7. If so, you can answer subsequent questions and return to questions 6 and 7 later

6. This question has four parts and asks: (a) how many designated use changes in total were adopted by your state?; (b) how many of the designated use changes resulted in a new use that is more stringent than the previous use?; (c) how many of the designated use changes resulted in a new use that is less stringent than the previous use?, and (d) how many UAAs has your state submitted to EPA?

   (*Please indicate "0" if your answer is zero.*)

   6a. For each of the calendar years listed below, what was the total number of designated use changes that were adopted by your state?

   1997 ____

   1998 ____

   1999 ____

   2000 ____

   2001 ____

   Please enter any comments about Question 6a:

   6b. For each year listed below, what was the total number of designated use changes **that resulted in a use that is *more* stringent** than the previous use?

   1997 ____

   1998 ____

   1999 ____

   2000 ____

   2001 ____

3

6c. For each year listed below, what was the total number of designated use changes **that resulted in a use that is *less* stringent** than the previous use?

1997 ____

1998 ____

1999 ____

2000 ____

2001 ____

6d. For each year listed below, what was the total number of UAAs your state submitted to EPA?

1997 ____

1998 ____

1999 ____

2000 ____

2001 ____

UAA Time and Cost Estimates and Results

7. Of the UAAs completed in your state **in the past 5 years**, please estimate:

7a. The range of time (in months) it took your state to conduct the UAAs. (Example: From: "**6**" To: "**12**" months.)

From: ____

To: ____

7b. The range of time (in months) it took EPA to review and approve or disapprove the designated use changes supported by the UAAs. (Example: From: "**3**" To: "**6**" months.)

From: ____

To: ____

7c. The range of costs (in dollars) to your state in conducting the UAAs. (Example: From: "**25000**" To: "**200000**" dollars. Please do not use dollar signs, commas or decimals.)

From: ____

To: ____

7d. The percentage of UAAs that showed:

No change was needed: ____

A more stringent use was needed: ____

A less stringent use was needed: ____

Please explain any factors that contributed to the ranges of time and cost:

4

UAA Process

8. To what extent does EPA encourage your state to conduct UAAs?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Very great extent
2. ☐ Great extent
3. ☐ Moderate extent
4. ☐ Minor extent
5. ☐ Very minor extent
6. ☐ Not at all
7. ☐ Don't know

Please enter any comments about question 8:

9. In general, how easy or difficult is it for your state to conduct UAAs?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Very easy
2. ☐ Somewhat easy
3. ☐ Neither easy nor difficult
4. ☐ Somewhat difficult
5. ☐ Very difficult
6. ☐ No UAAs conducted
7. ☐ Don't know

Please explain your answer to Question 9:

10. Has your state developed protocols for performing UAAs?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Yes
2. ☐ No
3. ☐ Currently developing protocols
4. ☐ Don't know

11. Is there any method besides UAAs that your state can use to refine designated uses?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Yes (please describe method in text box below)
2. ☐ No
3. ☐ Don't know

If you answered yes in Question 11, please specify:

UAA Barriers

12. What barriers, if any, affect whether your state conducts UAAs?
(PLEASE CHECK ALL THAT APPLY)

1. ☐ Lack of data on water bodies
2. ☐ Lack of data for criteria development
3. ☐ Lack of appropriate EPA guidance
4. ☐ Lack of EPA support
5. ☐ Lack of funding
6. ☐ Lack of resources
7. ☐ UAAs take too long to conduct
8. ☐ State policy prohibits UAAs
9. ☐ State does not have tiered designated uses/subcategories of uses
10. ☐ Response from the public
11. ☐ Other (please specify in text box below)
12. ☐ No barriers
13. ☐ Don't know

6

EPA Assistance and Guidance
The following 5 questions concern EPA assistance and guidance on conducting UAAs.

13. To what extent has your **EPA regional office** assisted your state during its efforts to conduct UAAs?
(PLEASE CHECK ONLY ONE ANSWER)

- 1. ☐ Very great extent
- 2. ☐ Great extent
- 3. ☐ Moderate extent
- 4. ☐ Minor extent
- 5. ☐ Very minor extent
- 6. ☐ Not at all (GO TO QUESTION 15.)
- 7. ☐ No UAAs conducted (GO TO QUESTION 16.)
- 8. ☐ Don't know (GO TO QUESTION 15.)

14. How helpful has assistance from your **EPA regional office** been during your state's efforts to conduct UAAs?
(PLEASE CHECK ONLY ONE ANSWER)

- 1. ☐ Very helpful
- 2. ☐ Somewhat helpful
- 3. ☐ Neither helpful nor hindering
- 4. ☐ Somewhat hindering
- 5. ☐ Very hindering
- 6. ☐ Don't know

15. How helpful has guidance from **EPA headquarters** been during your state's efforts to conduct UAAs?
(PLEASE CHECK ONLY ONE ANSWER)

- 1. ☐ Very helpful
- 2. ☐ Somewhat helpful
- 3. ☐ Neither helpful nor hindering
- 4. ☐ Somewhat hindering
- 5. ☐ Very hindering
- 6. ☐ Don't know

7

16. In your opinion, does your state need additional guidance on UAAs from EPA?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Yes (please specify in text box below)
2. ☐ No
3. ☐ Don't know

If you answered "Yes" in Question 16, please specify:

17. Other than guidance, what could EPA provide, if anything, that would assist your state in conducting UAAs?

Subcategories of Uses

18. We are aware that some states use **subcategories of uses**, referred to by the National Academy of Sciences as "tiered designated uses". Does your state currently have subcategories of uses?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Yes
2. ☐ No
3. ☐ Don't know

If you answered "Yes" in Question 18, please provide an example of subcategories used in your state:

19. To what extent has EPA encouraged your state's development of subcategories of uses?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Very great extent
2. ☐ Great extent
3. ☐ Moderate extent
4. ☐ Minor extent
5. ☐ Very minor extent
6. ☐ Not at all
7. ☐ Don't know

Please enter any comments about Question 19:

8

Relationship Between Designated Uses and TMDL Development
The next set of questions focuses on the relationship between designated uses and your state's development of TMDLs.

20. After identifying water bodies in your state that are not meeting standards, has your state attempted to refine a designated use prior to:

	Yes	No	Don't Know	No Response
20a. Listing the water body on your state's 303(d) list?	____	____	____	____
20b. Developing a TMDL?	____	____	____	____

21. To what extent has your state been successful in refining designated uses prior to:

	Very great extent	Great extent	Moderate extent	Minor extent	Very minor extent	Not at all	Don't know	No response
21a. Listing the water body on the state's 303(d) list? *(Please do not respond if you answered "No" to question 20a above.)*	O	O	O	O	O	O	O	O
21b. Developing a TMDL? Developing a TMDL? *(Please do not respond if you answered "No" to question 20b above.)*	O	O	O	O	O	O	O	O

Please enter any comments about Question 21:

22. To what extent has EPA encouraged your state to refine designated uses prior to:

	Very great extent	Great extent	Moderate extent	Minor extent	Very minor extent	Not at all	Don't know	No response
22a. Listing the waterbody on your state's 303(d) list?	O	O	O	O	O	O	O	O
22b. Developing a TMDL?	O	O	O	O	O	O	O	O

Please enter any comments about Question 22:

9

Barriers to Refining Uses Prior to Listing or TMDL Development

23. What 3 most important barriers, if any, does your state face to refining designated uses prior to either listing water bodies on the state's 303(d) list or developing TMDLs. For each barrier, what would you recommend to help reduce that barrier?

1. Barrier:

Recommendation (for first barrier, listed above):

2. Barrier:

Recommendation (for first barrier, listed above):

3. Barrier:

Recommendation (for first barrier, listed above):

10

Improvements to the Process of Refining Uses

24. Do you believe that an improvement in the process of refining designated uses would ultimately result in different water bodies being slated for TMDL development program?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Yes
2. ☐ No
3. ☐ Don't know

Please explain your answer to Question 24:

25. Please list any additional ways you believe the process of refining designated uses can be improved.

Relationship Between Designated Uses and Antidegradation

26. To what extent, if at all, do you believe your state's antidegradation policy limits your state's ability to refine designated uses?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Very great extent
2. ☐ Great extent
3. ☐ Moderate extent
4. ☐ Minor extent
5. ☐ Very minor extent
6. ☐ Not at all
7. ☐ Don't know

Please enter any comments about Question 26:

27. In what year did your state adopt its **current** antidegradation policy and antidegradation implementation procedures?

27a. Antidegradation policy: ____

27b. Antidegradation implementation procedures: ____

11

28. In your opinion, do your state's antidegradation policy and/or antidegradation implementation procedures need to be revised?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Antidegradation policy needs to be revised
2. ☐ Antidegradation implementation procedures need to be revised
3. ☐ Both need to be revised
4. ☐ Neither need to be revised
5. ☐ Don't know

Please enter any comments about Question 28:

Water Quality Criteria

The following set of questions addresses your state's water quality criteria needs.

29. **In general**, to what extent does your state have the information, or is able to obtain the information, it needs to perform the following activities to improve water quality criteria?
(PLEASE CHECK ONE FOR EACH ACTIVITY.)

	State has or can obtain **all or almost all** necessary information	State has or can obtain **more than half of** necessary information	State has or can obtain **about half of** necessary information	State has or can obtain **less than half of** necessary information	State has or can obtain **none or almost none** of necessary information	Don't know	No response
a. Activity 1: Revise existing criteria	☐	☐	☐	☐	☐	☐	☐
b. Activity 2: Develop new criteria	☐	☐	☐	☐	☐	☐	☐
c. Activity 3: Adapt EPA criteria to meet state needs	☐	☐	☐	☐	☐	☐	☐
d. Activity 4: Develop criteria translators	☐	☐	☐	☐	☐	☐	☐
e. Activity 5: Develop site specific criteria	☐	☐	☐	☐	☐	☐	☐

Please enter any comments about Question 29:

30. **For each of the following parameters**, please specify the extent to which your state has or can obtain the **scientific information** needed to develop or revise your state's water quality criteria.
(PLEASE CHECK ONE FOR EACH PARAMETER.)

	State has or can obtain **all or almost all** necessary information	State has or can obtain **more than half of** necessary information	State has or can obtain **about half of** necessary information	State has or can obtain **less than half of** necessary information	State has or can obtain **none or almost none** of necessary information	Don't know	No response
a. Nutrients	☐	☐	☐	☐	☐	☐	☐
b. Pathogens	☐	☐	☐	☐	☐	☐	☐
c. Organics	☐	☐	☐	☐	☐	☐	☐
d. Clean Sediment	☐	☐	☐	☐	☐	☐	☐
e. Contaminated Sediment	☐	☐	☐	☐	☐	☐	☐
f. Dissolved Oxygen	☐	☐	☐	☐	☐	☐	☐
g. Metals	☐	☐	☐	☐	☐	☐	☐
h. Other (please specify in text box below)	☐	☐	☐	☐	☐	☐	☐

If you responded "Other" in Question 30, please specify parameter:

Please enter any comments about Question 30:

EPA Criteria Documents

31. In your opinion, to what extent has EPA provided updated criteria documents that reflect "latest scientific knowledge"?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Very great extent
2. ☐ Great extent
3. ☐ Moderate extent
4. ☐ Minor extent
5. ☐ Very minor extent
6. ☐ Not at all
7. ☐ Don't know

Please enter any comments about Question 31:

13

Criteria Development

32. In your opinion, what are the 3 most important pollutants for which criteria need to be **developed** by your State or EPA? (For the purpose of this survey, pollutants can include stressors such as sediment and temperature.)

1. Pollutant:

Who should develop the criteria for the first pollutant you identified?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ The State should develop the criteria
2. ☐ EPA should develop the criteria
3. ☐ Both the State and EPA should develop the criteria
4. ☐ Don't know

2. Pollutant:

Who should develop the criteria for the second pollutant you identified?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ The State should develop the criteria
2. ☐ EPA should develop the criteria
3. ☐ Both the State and EPA should develop the criteria
4. ☐ Don't know

3. Pollutant:

Who should develop the criteria for the third pollutant you identified?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ The State should develop the criteria
2. ☐ EPA should develop the criteria
3. ☐ Both the State and EPA should develop the criteria
4. ☐ Don't know

Please enter any comments about Question 32:

14

Criteria Revision

33. For this question, we are interested in finding out about **any** revisions you believe are needed within the following criteria parameters.

In your opinion, for which of the following do criteria need to be **revised** by your state and/or EPA?

	State should revise	EPA should revise	Both State and EPA should revise	No revision necessary	Don't know	No Response
a. Nutrients:	☐	☐	☐	☐	☐	☐
b. Pathogens	☐	☐	☐	☐	☐	☐
c. Clean Sediment	☐	☐	☐	☐	☐	☐
d. Contaminated Sediment	☐	☐	☐	☐	☐	☐
e. Dissolved Oxygen	☐	☐	☐	☐	☐	☐
f. Metals	☐	☐	☐	☐	☐	☐
g. Other (please specify below)	☐	☐	☐	☐	☐	☐

If you answered "Other" in Question 33, please specify pollutant:

34. Which key pollutants in your state have narrative criteria but are in need of numeric criteria?

Monitoring to Determine if Criteria are Being Attained

35. We have heard that some states have adopted criteria for which they may not be able to gather the data needed in order to determine whether their water bodies are meeting those criteria. We are interested in learning about your state's criteria and EPA's assistance in developing those criteria.

To what extent have your state's criteria been established in such a way that the state can reasonably monitor its water bodies in order to determine if the water bodies are meeting the criteria?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Very great extent
2. ☐ Great extent
3. ☐ Moderate extent
4. ☐ Minor extent
5. ☐ Very minor extent
6. ☐ Not at all
7. ☐ Don't know

Please enter any comments about Question 35:

15

36. To what extent has EPA assisted your state in developing criteria in such a way that your state can reasonably monitor its water bodies in order to determine if they meet the criteria?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Very great extent
2. ☐ Great extent
3. ☐ Moderate extent
4. ☐ Minor extent
5. ☐ Very minor extent
6. ☐ Not at all
7. ☐ Don't know

Please enter any comments about Question 36:

State Experience: Modifying Water Quality Criteria

The following set of questions addresses your state's experience with modifying water quality criteria. For the purpose of this survey, modifying criteria includes all activities your state undertakes, from gathering appropriate data through EPA approval or disapproval.

37. In your opinion, how easy or difficult is it for your state to modify criteria?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Very easy
2. ☐ Somewhat easy
3. ☐ Neither easy nor difficult
4. ☐ Somewhat difficult
5. ☐ Very difficult
6. ☐ Don't know

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38. What barriers, if any, affect your state's ability to modify water quality criteria?
(PLEASE CHECK ALL THAT APPLY)

1. ☐ Lack of funding
2. ☐ Lack of resources
3. ☐ State legislature
4. ☐ Lack of guidance provided by EPA
5. ☐ Lack of data on water bodies
6. ☐ EPA approval process
7. ☐ Interaction with your regional EPA office
8. ☐ Differences between EPA regional and headquarters
9. ☐ Response from the public
10. ☐ Response from the regulated community
11. ☐ Other (please specify in comment box below)
12. ☐ No barriers
13. ☐ Don't know

If you answered "Other" in Question 38 above, please specify barrier:

Please enter any comments or other barriers for Question 38:

Improvements to the Process of Modifying Water Quality Criteria

39. Please list ways you believe the process of modifying water quality criteria can be improved:

40. Do you believe that an improvement in the process by which your state can modify water quality criteria would ultimately result in different water bodies being slated for TMDL development?
(PLEASE CHECK ONLY ONE ANSWER)

1. ☐ Yes
2. ☐ No
3. ☐ Don't know

Please enter any comments about Question 40:

17

General Water Quality Standards Questions

41. In your opinion, how easy or difficult is it for your state to modify its water quality standards? *(PLEASE CHECK ONLY ONE ANSWER)*

    1. ☐ Very easy
    2. ☐ Somewhat easy
    3. ☐ Neither easy nor difficult
    4. ☐ Somewhat difficult
    5. ☐ Very difficult
    6. ☐ Don't know

    Please explain your answer to Question 41:

42. Please provide any additional comments you have about the water quality standards program, particularly as it relates to your state's efforts to implement the TMDL program:

Completing the Survey

43. After reviewing your responses, we may want to contact you for additional information. Please provide your contact information:

    Name:

    Title:

    Phone Number:

44. We expect to release our report in January 2003. Would you be interested in receiving an email notification with instructions on how to access our report online when the report is released? *(PLEASE CHECK ONLY ONE ANSWER)*

    1. ☐ Yes
    2. ☐ No

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Comments from the Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 14 2003

OFFICE OF
WATER

John B. Stephenson
Director, Natural Resources and the Environment
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Stephenson:

Thank you for the opportunity to review the draft General Accounting Office (GAO) Report, "Water Quality: Improved EPA Guidance and Support Can Help States Develop Standards That Better Target Cleanup Efforts." We appreciate the effort your staff has made to understand the water quality standards program and will give serious consideration to your recommendations. In this letter we are providing our substantive comments on the Report. We are providing separate technical and editorial comments regarding factual information in the Report.

Throughout the document, the Report emphasizes the need for the Environmental Protection Agency (EPA) to publish nutrient and sedimentation criteria since many waters are identified to be impaired by these pollutants. We agree wholeheartedly, but believe your readers need to know that EPA has made significant progress in developing criteria for these pollutants, especially for nutrients. EPA has published final nutrient criteria recommendations for all fresh waters (except wetlands) in the contiguous United States. EPA is currently working on nutrient criteria recommendations for wetlands. In addition, EPA has published final guidance on how to develop nutrient criteria for estuaries and coastal waters. Concerning sedimentation, EPA has issued several technical papers and provided some guidance to States. The Office of Wetlands, Oceans, and Watersheds (OWOW), in EPA's Office of Water, is developing guidance for sedimentation TMDLs, including innovative guidance on assessing watersheds for river stability and sediment supply. The Office of Science and Technology (OST) is developing a sedimentation criteria strategy for review by EPA's Science Advisory Board during 2003. OST and OWOW are also working with EPA's Office of Research and Development (ORD) on sedimentation workshops, synthesis papers, and ORD's research projects concerning sedimentation exposure, risk assessment, sedimentation effects, and risk management/restoration. As a point of clarification, we suggest you use the term "sedimentation" criteria rather than "sediment" criteria. Without this change, readers may confuse the term with criteria for "contaminated sediments."

The Report states in several places that the new criteria for nutrients, sediments and "other pollutants" will lead to large increases in the numbers of waters listed as impaired. This in fact may not be the case for several reasons. (Use changes and criteria modifications may also lead to some differences in the lists, but not necessarily a huge increase or decrease.) First, the lists may change with some waters being de-listed and some being added as a result of States adopting new criteria depending on how the States have prepared their previous lists. Second, many of the waters listed as impaired for nutrients or sediments are listed based on narrative criteria or qualitative assessments. New quantitative criteria may actually help refine the impaired waters lists as the States will have numeric benchmarks with which to evaluate monitoring data. These criteria will also serve as quantitative targets to help prepare restoration plans and thus reduce the number of waters on the list. Finally, it is unclear how to interpret State responses to your survey since the survey was conducted just as States were preparing their 2002 section 303(d) lists of impaired waters requiring TMDLs. State lists from 1998/2000 are the basis for EPA's current estimate of 35,000 TMDLs[1] needed, but most States have now submitted their 2002 lists based on new information and on EPA's November 2001 listing guidance.[2] This guidance establishes a revised framework for assessing waters. Preliminary analysis of the 2002 section 303(d) lists indicates that many States are refining their lists as a result of this guidance. We suggest that GAO's projection of "increases" in waters listed may be difficult to justify given the changing baselines.

The Report suggests that States are concerned with EPA's guidance to States on developing and adopting nutrient criteria (chapter 3, page 35). The statements in the Report do not recognize the progress EPA has made in the past year to address many of the States' concerns. For example, in response to States' concern that EPA's nutrient criteria recommendations may not be appropriate for specific waters, EPA clarified in a November 2001 guidance memorandum that States have the flexibility to adopt EPA's recommendations, adapt the recommendations to better reflect local conditions, or to develop nutrient criteria using other scientifically defensible methods. EPA recommended that States develop nutrient criteria plans describing their expected approach to developing criteria and the schedule they plan to meet. EPA requested that States share these plans with EPA for purposes of coming to a mutually agreeable approach. Since we issued the November 2001 guidance memorandum, we have received a positive response from almost all States interested in developing plans and pursuing development and adoption of nutrient criteria.

With regard to designated uses, the Report says that additional guidance on how to change uses is needed because the "incorrect uses" in place are causing waters to be inappropriately slated for TMDLs. EPA does not believe the current designated uses are

[1]EPA Office of Water; Office of Wetlands Oceans and Watersheds. National Section 303(d) List Fact Sheet. <http://oaspub.epa.gov/waters/national_rept.control> Last updated December 31, 2003.

[2]EPA Office of Water, "2002 Integrated Water Quality Monitoring and Assessment Report Guidance," Memorandum from Robert H. Wayland III, Director, Office of Wetlands, Oceans and Watersheds, to EPA Regional Offices and Directors of State and Authorized Tribal Water Quality Program Directors, Nov. 19, 2001.

necessarily "incorrect" in these situations. Waters may be listed as impaired inappropriately because the uses applying to those waters are not specific enough to properly describe the desired conditions. Therefore, EPA intends to provide guidance to States on how to change their uses so that they can establish a more refined set of uses to assign their waters that will better characterize the States' water quality goals for specific waters. In addition, the survey you sent to States asked whether they believed their designated uses were "reasonable" and if they believed any "refinement" in the uses were needed. The language in the survey did not suggest that uses may be considered "incorrect." We suggest that you clarify this point in the report and remove any language suggesting that "more accurate designated uses" are necessary. You may wish to consider including the survey instrument in the Report as an appendix.

In Chapter 2, the Report fails to identify significant non-EPA barriers that States face when changing designated uses. These include burdensome State rulemaking processes, public opposition to any "downgrades" and resource shortages that make it difficult for States to invest in necessary monitoring and assessment programs. The Report does address similar non-EPA barriers (e.g. public perception, resource shortages, stakeholder resistance) to criteria modifications in Chapter 3. We suggest including such a discussion on the non-EPA barriers to designated use changes in Chapter 2.

Once again, we appreciate the opportunity to coordinate with your staff on this Report. Should you need any additional information or have further questions, please contact Fred Leutner, Chief of the Water Quality Standards Branch at (202) 566-0378 or Don Brady, Chief of the Watershed Branch at (202) 566-1227.

Sincerely,

Geoffrey H. Grubbs, Director
Office of Science and Technology

Sincerely,

Diane C. Regas, Director
Office of Wetlands, Oceans, and Watersheds

GAO Contacts and Staff Acknowledgments

GAO Contacts

John Stephenson, (202) 512-3841
Steve Elstein, (202) 512-6515

Acknowledgments

In addition to the individuals named above, Barbara Patterson, Katheryn Summers, and Michelle K. Treistman made key contributions to this report. Also contributing to this report were Nancy Crothers, Brandon Haller, Karen Keegan, and Elsie Picyk.

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