

Appendix 3: A Nonpoint Source “Cookbook” for State TMDL Programs

Recipes for More Effectively Addressing Nonpoint Source
Impairments through the TMDL Program⁴

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⁴ This Appendix sets forth the initial iteration of what ELI intends to maintain as a living document. New entries will be included—and details added—as additional examples and information become available.

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1. Developing TMDLs

A. Develop TMDLs using good science and detailed nonpoint information

i. Model to the appropriate level

Depending upon the circumstances, you may have to develop detailed, site-specific models for certain NPS—particularly where there are many contributing sources, such as septic system impacts to local embayments. Note that in some instances, this approach could be a waste of time—as with bacteria impacts, where bacteria source identification is more important than development of models.

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ii. Designate a load allocation for the objective

WLAs must be translatable into effluent limits—the idea we’re going to try for nonpoint is to use the necessary BMPs as a surrogate for a load allocation, so instead of saying in the TMDL that the load allocation is a 90% reduction of fecal coliform, we say that the load allocation is to implement the specific BMPs that will achieve compliance.

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iii. Give explicit directions: where, how, and by when

TMDLs need to inform NPS and watershed plans by presenting specific information on current conditions, necessary load reductions, likely contributing areas, hydrologic context of impairing pollutants, necessary programs, practices, and placement, and an accurate timeline over which implementation will be accomplished and water quality improvements seen—with attainment of standards the goal.

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B. Package the TMDL strategically

i. Make data understandable to a wider audience

Make data more understandable for key audiences beyond EPA (e.g., end users, the legislature). We tend to do a very good job on the kinds of technical analysis in TMDL development that are required to secure EPA approval. However, very little of this information is usually needed by those that will actually be implementing the TMDL, or useful to decision-makers at higher levels of government. In addition, many of our TMDLs are being written for temperature, with time horizons for meeting the TMDL load allocations on the order of decades. A TMDL should include information that is understandable by and readily accessible to the people who will actually be working with the TMDL. TMDL load allocations should be linked to both administrative measures (number of stream miles

restored, number of grant dollars spent in a watershed, etc.) and environmental measures (temperature of stream, recovery of fish populations, etc.) .

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ii. Push technical information into appendices

First, we have developed a Document Template and a Style Guide for our TMDL reports so that there is consistency in the look, feel, and readability across all reports, regardless of authorship. As for the documents themselves, they all start with a Report Summary which is purposefully written in simple, understandable language that can be read by the casual reader who wants to get the essence of the report. In this section we pose and answer a series of simple questions:

1. What is the purpose of this report?
2. What's wrong with the [waterbody name]?
3. What is causing the problem?
4. What can be done to improve the [waterbody name]?
5. Who is responsible for a cleaner [waterbody name]?

This is immediately followed by a table that lists and addresses the EPA required elements of an approvable TMDL, with references to pages and tables within the report where specific numeric values for the WLA, WLALA, etc., can be easily found. We try as best we can to keep the language in the main body of the report as simple and straightforward as possible. Any complex or highly technical modeling or analysis is placed in the appendix and the reader is referred to the appendix for further technical detail. We also include a brief Implementation Section, which generally describes the kinds of actions that will need to be taken in order to achieve the NPS reductions called for in the report, along with language encouraging readers to take the next steps and develop and implement a Watershed Management Plan. Finally, the Monitoring Section articulates both the planned ongoing monitoring efforts (if any) and a framework for an “ideal” monitoring plan (one that assumes sufficient resources are available to be deployed in the watershed). The appendix includes a Glossary of Terms and Acronyms for readers who may not be as familiar as we are with some of the jargon of TMDLs.

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iii. Present data in a way that maximizes collaboration

In our estuaries project, the individual towns within common watersheds sought separate allocations for each town. We realized that taking such an approach could result in more costly solutions, as opposed finding

solutions on a watershed basis. As a result, we allocated loads by watershed and subwatershed to force the towns to work together to find the most cost-effective solution. The loadings are done by watershed, not by town, compelling the towns to work with their neighbors rather than point fingers.

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2. Bridging the Divide between Development and Implementation

A. Include an implementation plan with each TMDL

In Oregon, the TMDL implementation plan is adopted as part of the TMDL. The TMDL is issued as a department order to all responsible parties (known as “Designated Management Agencies”) and spells out specific TMDL implementation requirements for them to follow. Oregon was fortunate to have legal authorities developed in the early 1990s that define how TMDLs will be addressed for the agricultural sector. If DEQ does not approve of Oregon Forestry or Ag Department efforts to implement TMDLs, there is a statutorily-prescribed appeals process. Oregon has enforceable authorities—including for nonpoint sources—across all land uses.

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B. Keep the TMDL science-based—and politics-free

TMDL development arises from objective scientific analysis, whereas implementation planning can be subject to various political pressures. Don’t mix the two, because the implementation planning process can politicize the technical TMDL analysis.

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C. Integrate TMDL development and implementation

i. Combine TMDL and 319 programs

The Watershed Planning Unit in the Department of Ecology’s (DOE) Water Quality Program is responsible for oversight of both the TMDL and Nonpoint Programs. As our focus turned more and more toward nonpoint pollution, and as more of our TMDLs began to address nonpoint problems, it became clear that our way of doing business was neither practical nor logical. We have made changes to merge the two programs and make them more effective:

- We consider an array of solutions, including using enforcement, trying a “straight-to-implementation” strategy, going directly to source identification without setting load allocations, or doing either a “streamlined” or conventional TMDL.

- We are revising State Environmental Policy Act (SEPA) guidance to require that TMDLs be considered during SEPA review.
- We are revising our TMDL templates to add language that makes it clear that DOE's TMDLs, including nonpoint TMDLs, are enforceable under State law.
- We are focusing our nonpoint program on producing results, so we are placing more emphasis on implementation. Our 319 grant from EPA will be increasingly directed toward on-the-ground best management practices that will have a measurable water quality benefit.
- We are working to capture the knowledge we've gained from doing nonpoint TMDLs and to use it to establish minimum standards for various land uses that generate nonpoint pollution.
- We are examining the State's forest practice rules to evaluate their ability to effectively protect water quality.

See the document on *Merging the 319 and TMDL programs* (available on ELI's *State TMDL Program Resource Center* website) for further details of the efforts undertaken so far.

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ii. Establish an MOU between agencies responsible for developing and implementing TMDLs

Virginia Department of Environmental Quality (VDEQ) and Virginia Department of Conservation and Recreation (VA DCR) have in place an MOU concerning TMDL development and implementation. VDEQ conducts TMDL studies, and VDCR does implementation plans when dealing with NPS pollution (through the MOU).

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D. Prioritize use of funds to support TMDL implementation

We revised our SRF/319 priority ranking system to give higher priority to projects designed to implement BMPs where a segment was already on the 303(d) list, was a direct result of implementation of a watershed action plan, or was in response to a TMDL.

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We actively use funding to implement BMPs and TMDLs instead of allowing external agencies to apply for any water quality project they want to do, and we use 319 clean water management measures as the goals for the TMDL program. The TMDL goal is no longer to produce TMDLs; it's to produce clean water.

See *2008 Strategy Soiree instructions* (available on ELI's *State TMDL Program Resource Center* website) for the initial vision of moving from dirty water to clean water.

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The ranking criteria in all of our State funding programs (SRF, TMDL grants, 319 grants) provide higher priority to projects that will reduce pollutant loads to impaired waters. A hierarchical system is used with higher priority for projects contained in TMDL implementation plans than for projects discharging to waters with an adopted TMDL, and finally for projects discharging to waters on the adopted Impaired Waters List.

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E. Incorporate land use into TMDL implementation

Consider land use planning as a first step of TMDL implementation planning: proper choices of land development on the front end makes it easier on the back end to avoid difficult wetlands, forest, and stormwater-management issues.

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Develop site-specific BMPs based on land use information, the cost, the expected load reduction, the prescribed schedule, and the priorities for implementation in the watershed. Set milestones for recovery in the watershed.

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3. Implementing TMDLs

A. Develop implementation guidance

Washington State has developed *guidance* (available on ELI's *State TMDL Program Resource Center* website) on the nine key elements of a TMDL implementation plan.

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Massachusetts has developed implementation guidance on ways to address septic systems, including the development of sewage districts. (see Embayment Restoration and Guidance for Implementation Strategies at <http://www.mass.gov/dep/water/resources/coastalr.htm>)

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Distinguish between (1) guidance for developing “implementation plans,” and (2) guidance for changing routine operating procedures for State and local government planning and decisions to ensure consistency with TMDLs.

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B. Implement with active partners

i. Target implementation where groups are active

A key criterion for selecting watersheds for implementation plans and 319 funding is the presence of an active group. When groups have already conducted assessments or even conducted some planning, this helps with meeting funding responsibilities.

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ii. Require implementing municipalities to commit funds

In our estuaries project, we wanted to create long-term buy-in to the project—which is ultimately necessary to achieve environmental goals. As a result, we required a 50% cost share for the project. We also required a minimum of three years of data collection in each estuary in order to be prioritized and eligible for the project. In most cases, the towns sub-contracted directly with our university partners to collect the baseline data, the cost of which contributed towards the 50% cost share. Once in the project, the towns had a vested interest in seeing the project through to completion.

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iii. Work with the implementing institution to create the plan

Partner with watershed associations, conservation districts, or municipalities to develop an implementation plan that addresses the community’s need—either to implement a TMDL or to preempt one. The group creates a roadmap, and the agency provides funding and technical assistance. Technical information fits within the context of the plan.

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C. Craft implementation plans strategically

i. Create technical and public versions of implementation plans

Virginia has begun developing a more abbreviated and visually appealing version of the technical TMDL Implementation Plan for public distribution. It was clear that in the past, very few people within the local communities where we had developed implementation plans had the time to read the lengthy technical documents that we were producing. In the public

documents, we now include numerous pictures of the practices that we are recommending for the watershed, along with photos of the streams and land uses in the watershed. If a landowner is interested in more detailed information, such as model output, then he or she can be referred to the technical document.

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ii. Focus on source controls

It is much easier to prevent pollutants from entering the water than to treat the water. Therefore, focus on source controls whenever possible.

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D. Promote effective and sustained implementation

i. Hire a farmer to conduct outreach

We have found that farmers like to receive information from other farmers. Consequently, hiring a farmer or someone with a farming background to conduct outreach for implementing agricultural BMPs seems to work best. Hiring a local farmer is even better (provided that the farmer is respected in the community and has implemented BMPs on his or her own farm).

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ii. Recognize incremental improvements

Given that it can take years, or even decades, to obtain sufficient water quality data to be able to delist an impaired segment or waterbody, there needs to be a mechanism to recognize incremental improvements in water quality that occur in the interim. This recognition of incremental improvement is important not only for regulators, but also for maintaining local watershed momentum and for satisfying institutional needs to demonstrate that resource allocation is having a positive effect on water quality. This has prompted us to set aside about ten percent of our annual 319 incremental funds to support ongoing monitoring in watersheds where there are active efforts to address NPS pollution. The goal of this monitoring effort is to demonstrate incremental improvements in water column water quality that may fall short of the level of improvement needed to warrant a delisting. This improvement may come in the form of increasing trends in water quality, or perhaps even in a change in the slope of the curve for the water quality data that is collected. Alternatively, it may track water quality improvement in just one or two tributaries within the watershed where NPS BMPs are being targeted to address the most critical contributing sources. While these tributaries may show improvement in the near term, the improvement may not be quantifiable in the larger watershed context until many years into the future. We are also

exploring the possible development and use of some sort of water quality index to measure and track incremental improvement in water quality at this scale (typically a HUC-12).

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iii. Chose meaningful indicators

Use indicators to which the public in the watershed can relate. Think of water quality standards in terms of uses, not just criteria. Track required activities and monitor water quality—but wait to draw conclusions on cause and effect until you are confident you can discern the signal of program influence amidst the inherent background noise of water quality data.

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iv. Capitalize on momentum

To help ensure the long-term success of BMPs—and thereby actually accomplish our water quality goals—Virginia has worked to publicize the success of farmers, not the State and its objectives. When the creek improves, Virginia recognizes the contributors; money from various programs seems to follow, and the community is receptive. There has been an ownership of their success and profitability. With increasing community momentum and widespread notoriety (honors) comes a greater interest on the part of farmers in reducing pollution, that is, “doing their part.” Where this has been successful, farms are smaller and communities are tightly-knit.

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E. Use Economic Incentives

i. Shape the message

Emphasize how implementation measures will save stakeholders money and beneficially affect their productivity, rather than dwelling on the State’s water quality goals.

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ii. Tailor eligibility for grant funding

Washington has narrowed eligibility for grant funding of BMPs to those that we know achieve compliance with water quality standards. Previously, we funded anything that had a “water quality benefit.” For now, our eligibility criteria apply to grants only because very few applicants want a loan to deal with nonpoint problems, since there are no ratepayers to help repay the loan. However, we are working to make purchase of direct seed

drills attractive in the loan program by allowing conservation districts to purchase the drills with a loan and pay off the loan by renting the drill to farmers.

Agricultural practices that are eligible in our grant programs are described in *Additional BMP Eligibility* (available on ELI's *State TMDL Program Resource Center* website).

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F. Plan for the long-term

i. Implement over the long-term

Implement over a long period of time (up to 15 years). Florida divides its TMDL implementation plans into five-year blocks (consistent with its rotating basin approach).

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ii. Designate local coordinators to move and sustain projects

The scarcity of technical assistance for planning and administering good water quality projects is a major impediment to achieving TMDL water quality goals. To facilitate the implementation, monitoring, and reporting of high-priority water quality improvement projects in TMDL watersheds, we have found success in financially supporting and training local watershed coordinators through cooperative arrangements with partner agencies such as conservation districts and University Extension offices. Local coordinators also serve as effective marketing agents with landowners to implement water quality projects. Prior to initiating this program, funding was essentially provided on a first-come, first-served basis with little consideration of the effectiveness of the project and more on landowner willingness to participate. The primary challenges associated with this program are retaining qualified and motivated coordinators and maintaining their focus on TMDL implementation while leading more holistic watershed planning efforts. However, through regular training workshops and Statewide Watershed Coordinating Council meetings, we have cultivated a group of dedicated and enthusiastic proponents for water quality throughout the State.

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G. Establish direct coordination with other implementing agencies

i. Craft an MOU with another agency

In Oregon, MOUs with federal land managers have added clarity and direction as to how land managers and regulators can work together towards common goals. An MOU can specify management actions or

reference BMP guides, and it can provide for conflict resolution. Having in place written agreements that outline the agencies' working relationship, the nature of overlapping authorities, and who is responsible for what is an effective means of maintaining institutional knowledge.

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During the mid-to-late 1990's, there was an effort undertaken to develop cooperative agreements (MOUs, Intergovernmental Agreements (IGAs), Memoranda of Agreement (MOAs), etc.) among various entities in Arizona. These included tribes, federal and State land managers, and non-governmental organizations. Although, historically, seven agreements were reached, only the MOU with USFS remains current.

The spirit of the agreement is to keep the lines of communication open between the Arizona Department of Environmental Quality (ADEQ) Nonpoint Source (NPS) programs and the various interested parties. ADEQ meets annually with USFS personnel to discuss the ongoing NPS activities of each agency. Communication between the individual project managers continues throughout the year with the coordination of sampling efforts, project updates, and the general sharing of information.

ADEQ is currently reintroducing the concept of cooperative agreements with a variety of groups across the State to build upon the success of the USFS MOU.

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ii. Join the NRCS State Technical Advisory Committee (STAC)

While some States have concluded that participation was a potential political liability, several States, such as Florida, have participated fruitfully. Iowa has a number of staff that sit on the STAC and/or are actively involved on various subcommittees (as chairs or members).

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iii. Coordinate with local universities

The coordination between the Arizona Department of Environmental Quality (ADEQ) Surface Water programs and the State's universities has been very successful. The university contacts have provided a wide range of services, from informal presentations at watershed group meetings to TMDL model development. Contracts with universities typically cost less than a comparable contract with a consulting firm. Professors and their students offer specialized technical expertise and sampling experience,

and they often have specific local watershed knowledge from previous investigations.

Prior to being closed due to the current State budget shortfalls, the Arizona Water Institute (AWI) combined the expertise of Arizona's water managers with the resources of the three universities to support water resources management and technology development in real-world applications. This unique partnership—which also included three State agencies, Water Resources (ADWR), Environmental Quality (ADEQ), and Commerce (ADoC)—was formed to provide access to hydrologic information, support communities, and develop technologies to promote water sustainability.

The 319 program has also tapped the university system by providing funding for the Nonpoint Education for Municipal Officials (NEMO) and Master Watershed Stewards (MWS) Programs. NEMO activities include developing watershed-based plans for the ten major surface watersheds in Arizona, providing technical assistance to watershed groups and municipalities, and maintaining a GIS Internet Mapping Service (IMS) website. The NEMO plans and website are extensively used by watershed groups as they develop 319 grant applications. MWS educates local residents on watershed function and health with the goal of producing a trained group of citizens to undertake watershed improvement projects.

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To address nutrient impairments in our southeast coastal areas, we developed a collaborative partnership with the local university (UMass-Dartmouth School of Marine Science) as well as local planning agencies. Each participating group played a role in the development of the technical analysis and ultimately the TMDL. The university trained local groups (with a QAPP) to collect baseline data and was served as a primary lead for detailed data collection, modeling, and analysis (with MassDEP). The local planning agencies assisted by providing GIS support and worked directly with the town planning boards to conduct land use and water use analysis that ultimately feed into the watershed loading analysis. Although, overall, this has been a very positive experience and results in local buy-in for TMDL implementation, caution should be exercised: we have run into problems with the culture of the university system, which is that everything they do is considered research and proprietary—even though paid for with public funds. This can result in an inability to obtain (or delays in obtaining) data and model files for use at either the State or local level.

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