

MENU OF APPROACHES

Potential Approaches for States, Tribes, and
Territories to Achieve the Goals of the
Clean Water Act Section 303(d) Program Vision



Purpose

This document reflects a compilation of responses by state, tribal, and territorial staff regarding what their respective jurisdictions are doing, and what they believe could be useful means to achieve the goals of the Clean Water Act Section 303(d) Program Vision. This list is not exhaustive, as other options exist and others may be developed. The objective of any approach to implementing the vision goals ultimately will be meeting water quality standards. The appropriateness of a specific approach or collection of approaches in a particular circumstance will depend on those circumstances.

Structure

The main body and appendices of this document are divided by vision goal. The main body includes bulleted options for advancing each goal and brief descriptions of those options. The appendices provide examples in practice of the options, further elaborating on the nature of each option for achieving the respective goals of the Clean Water Act Section 303(d) Program Vision.

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**A Long-Term Vision for Assessment, Restoration, and Protection under the
Clean Water Act Section 303(d) Program**

The Clean Water Act Section 303(d) Program provides for effective integration of implementation efforts to restore and protect the nation's aquatic resources, where the nation's waters are assessed, restoration and protection objectives are systematically prioritized, and Total Maximum Daily Loads and alternative approaches are adaptively implemented to achieve water quality goals with the collaboration of states, federal agencies, tribes, stakeholders, and the public

“Prioritization” For the 2016 integrated reporting cycle and beyond, states review, systematically prioritize, and report priority watersheds or waters for restoration and protection in their biennial integrated reports to facilitate state strategic planning for achieving water quality goals

“Assessment” By 2020, states identify the extent of healthy and CWA Section 303(d) impaired waters in each state's priority watersheds or waters through site-specific assessments

“Protection” For the 2016 reporting cycle and beyond, in addition to the traditional TMDL development priorities and schedules for waters in need of restoration, states identify protection planning priorities and approaches along with schedules to help prevent impairments in healthy waters, in a manner consistent with each state's systematic prioritization

“Alternatives” By 2018, states use alternative approaches, in addition to TMDLs, that incorporate adaptive management and are tailored to specific circumstances where such approaches are better suited to implement priority watershed or water actions that achieve the water quality goals of each state, including identifying and reducing nonpoint sources of pollution

“Engagement” By 2014, EPA and the states actively engage the public and other stakeholders to improve and protect water quality, as demonstrated by documented, inclusive, transparent, and consistent communication; requesting and sharing feedback on proposed approaches; and enhanced understanding of program objectives

“Integration” By 2016, EPA and the states identify and coordinate implementation of key point source and nonpoint source control actions that foster effective integration across CWA programs, other statutory programs (e.g., CERCLA, RCRA, SDWA, CAA), and the water quality efforts of other Federal departments and agencies (e.g., Agriculture, Interior, Commerce) to achieve the water quality goals of each state

Timeline for Goal Statements

2014 – Engagement

2016 – Prioritization, Protection, Integration

2018 – Alternatives

2020 – Assessment (Site-specific)

2022 – Evaluate accomplishments of the Vision and Goals

PRIORITIZATION

Goal: For the 2016 integrated reporting cycle and beyond, states review, systematically prioritize, and report priority watersheds or waters for restoration and protection in their biennial integrated reports to facilitate state strategic planning for achieving water quality goals

Current approaches to prioritization

- **Recovery potential**

A state, tribe, or territory could prioritize waters based upon their respective projected ability to meet water quality standards again. Recovery Potential Screening is a method of comparing the relative restorability of large numbers of watersheds (e.g., across a state) by measuring several ecological, stressor, and social context indicators associated with the likelihood of successful restoration efforts. EPA has designed and continues to test with states a recovery potential screening tool.

Examples: prioritize NPS-impaired waters most likely to be recoverable using the recovery potential tool (MA); target CWA 319(h) grant funding to biologically impaired waters demonstrating high potential for removal from the state's CWA 303(d) list (MD)

- **Multi-agency team**

To determine which waters are to receive priority treatment, a state, tribal, or territorial program could collaborate with other CWA programs and other agencies. Each entity would contribute its priorities given its respective charge, from which the team would determine the collective priorities. This approach ideally improves integration at the start, coordinating what to work on and how, and may improve implementation.

Examples: DEC, DNR, and DF&G rank waters (AK); TCEQ, TSSWCB, and RAs plan and prioritize waters (TX)

- **Public input**

A state, tribe, or territory may use direct communication with the public or simply the presence of active stakeholders to determine which waters to prioritize. Public input can serve as a rough indicator of social impact, economic value, political relevance, and ideally potential support for implementation.

Examples: public nominates water bodies for priority (AK); public review of CWA 303(d) list informs TMDL and plan priorities (CT)

- **Availability of implementation support**

Whether from other CWA programs, other agencies, watershed groups, or other entities, a state, tribe, or territory may prioritize waters based upon the potential support it may receive to implement a TMDL or alternative approach. This strategy does not necessarily require involvement of those other entities in the prioritization process, rather just a prediction of the money, time, influence, and authority that they may provide collectively toward meeting water quality standards.

Examples: the degree of citizen interest (IA); the number of stakeholders in TMDL development and the interest level of watershed groups (IL); the involvement of other agencies (CO)

- **Economics**

Related to the availability of implementation support is prioritization based on economics, although this approach considers the projected cost of restoration in addition to the availability of funds to accomplish it. At its simplest, this is "bang for the buck," prioritizing waters offering the most results (restoration, improvement, social or

ecological benefit, etc.) for the least cost. But it also can include consideration of how much financial support may be available and the likelihood of procuring it, from sources such as CWA 319 funds.

Example: local governments select and install BMPs in areas with the greatest water quality improvement potential for the cost (MN)

- **Nutrient Framework Memo**

When a state, tribe, or territory is prioritizing waters not meeting nitrogen and/or phosphorus criteria, they might use the prioritization framework identified in the EPA memo *Working in Partnership with States to Address Phosphorus and Nitrogen Pollution through Use of a Framework for State Nutrient Reductions*. That framework suggests identifying HUC-8 watersheds that individually or collectively account for most of the nutrient load in the state and then prioritize HUC-12 watersheds therein for implementing targeted load reduction activities.

Example: stream total phosphorus and lake eutrophication impairments in HUC-8's identified with high nutrient loading are the basis for scheduling TMDL development over the next eight to ten years (KS)

Current approaches regarding what to prioritize

A state, tribe, or territory may choose to prioritize waters based upon any number of factors. Examples of potential factors are described below. Ultimately, priorities will be translated into geographic terms, from as broad as HUC-6 watersheds to as pinpointed as water segments.

- **Pollutants**

The most significant issue facing a state, tribe, or territory may be a specific pollutant or set of pollutants. The pollutant(s) may be in the public spotlight, be significantly affecting uses throughout the state, or be of particular concern to public health, and thus worthy of concentrated effort.

Examples: total phosphorus (KS); bacteria and nutrients (MA); temperature caused by nonpoint sources (ID)

- **Impacts/uses**

Similar to prioritizing pollutants, a state, tribe, or territory could prioritize waters based upon the effects of water quality impairments. These effects could be general, such as environmental harm, or pertain to specific designated uses, such as drinking water or primary recreational contact.

Example: human health risk (MO)

- **Sources**

A state, tribe, or territory may find the most effective means of improving water quality and ultimately meeting water quality standards to be prioritizing categories of water pollution sources. This approach likely would be useful when certain types of sources are significant contributors to major water quality problems in the state or improvements to certain sources are deemed highly cost-effective.

Examples: abandoned/legacy mines (CO); Chesapeake Bay watersheds in most need of NPS pollution reduction (MD)

ASSESSMENT

Goal: By 2020, states identify the extent of healthy and CWA Section 303(d) impaired waters in each state's priority watersheds or waters through site-specific assessments

Current approaches to assessment

- **Focus monitoring on unassessed waters**

One means of expanding the number of assessed waters is prioritizing the monitoring of all or a select group of the unassessed waters, likely at the expense of the number of previously assessed waters that are monitored and/or the frequency of sampling.
Examples: ensure that sampling sufficiently covers unassessed waters so that they meet the minimum requirements for Integrated Reports (MD); identify areas historically lacking data, such as high alpine lakes, and increase sampling there (CO)
- **Probabilistic monitoring**

Whether through National Aquatic Resource Surveys or purely state-initiated probabilistic surveys, random but spatially distributed sampling of subsets of waters along with statistical analysis can supplement site-specific monitoring data. Probabilistic monitoring offers an estimate of the quality of all waters, which can reveal trends and identify stream reaches that may contribute to an impairment as well as be a factor in determining which areas to target for intensive sampling.
Examples: National Aquatic Resource Surveys (NARS) (EPA); Random Ambient Monitoring System (RAMS) (NC); probabilistic biomonitoring to provide a statistical overview of percentage of supporting and nonsupporting wadeable streams (KY)
- **Targeted monitoring**

A state, tribe, or territory could prioritize the monitoring of unassessed waters based upon the potential impact that the assessments may have on future decisions and actions.
Examples: focus monitoring on waters in areas of significant resource development without adequate baseline water quality data (MT); Intensive sampling of those waters identified by probabilistic monitoring to be impaired and also have installed BMPs and/or active watershed groups (IN)
- **Rotational monitoring**

A state, tribe, or territory could monitor more sites without added financial resources by systematically monitoring sites on a rotating basis, as opposed to monitoring the same sites every year. Commonly, a set of sites are monitored in depth for a year or two, at which point a new set of sites are monitored, and then another set, until all sets of sites have been monitored and the process starts again with the original set of sites.
Examples: HUC-8 watershed intensive monitoring on a 10-year cycle (MN); a 5-year cycle with 2 to 4 major drainage basins each year (NY)
- **Use of data from volunteer monitoring and other sources**

Clean Water Act programs need not rely solely on their monitoring data for water quality assessments. Other state and federal agencies collect data for their own purposes that are potentially useful for water quality assessments. The challenge is assuring that the data are of sufficiently high quality, which can be addressed through education of volunteers and coordination with universities and other agencies.
Examples: trained volunteer monitoring groups (MT); universities (AZ); state fisheries division (MI); USGS (KS)

- **Improved databases**
Beyond the monitoring of waters, assessments are time consuming in part because of the data available, whether inadequately cataloged, of poor quality, or incomplete. Databases that can handle more information, in various forms, and from more sources reduce these hurdles.
Example: California Environmental Data Exchange Network (CA)
- **Improved assessment process**
A state, tribe, or territory may be able to review more waterbodies in the same amount of time through improvements in assessment process efficiency. These improvements can come through advancements in technology and/or greater clarity in what qualifies as an impaired water, specifically when working with narrative criteria.
Examples: automated assessment process (NM); refining methods for determining impairment (MT)

PROTECTION

Goal: For the 2016 reporting cycle and beyond, in addition to the traditional TMDL development priorities and schedules for waters in need of restoration, states identify protection planning priorities and approaches along with schedules to help prevent impairments in healthy waters, in a manner consistent with each state's systematic prioritization

Current approaches to prioritizing protection

- **Multi-agency team**
A state, tribal, or territorial program could collaborate with other CWA programs and other agencies, with each entity contributing its priorities given its respective charge. The team would determine the collective protection priorities, possibly in conjunction with determining restoration priorities. This approach ideally improves integration at the start, coordinating what to protect and how, and may improve implementation.
Example: DEC, DNR, and DF&G rank waters (AK)
- **Input from other agencies and the public**
A state, tribe, or territory may use direct communication with the public and other agencies and organizations, whether on an ad hoc basis or as part of a coordinated planning process, to determine which waters to protect. This input can serve as a rough indicator of the social impact, economic value, and political relevance of the waters, and it ideally focuses protection where there is support for implementation.
Examples: protection planning priorities largely driven by grassroots water quality concerns and EPA priorities (NY); local prioritization processes with DEQ basin coordinators and other partners (OR)
- **Degree or nature of threat to water quality**
A state, tribe, or territory may choose to prioritize protection efforts on those waters least likely to continue meeting water quality standards. The waters may be threatened because they already are degraded and only barely meet water quality standards or because development or other foreseeable influences likely will degrade high quality waters.
Examples: prioritize "stressed" waters for protection (NY); address declining water quality trends in healthy waters, notably those with limited assimilative capacity (MD)

- **Value to watershed**
Certain healthy waters can have more functional value than others, whether a source of clean water to an otherwise degraded waterbody or critical habitat for species vital to the riparian ecology of the watershed. A state, tribe, or territory may choose to prioritize protection based upon these factors.
- **Availability of implementation support**
Whether from other CWA programs, other agencies, watershed groups, or other entities, a state, tribe, or territory may prioritize waters for protection based upon the potential support available to implement the protective measures. This strategy does not necessarily require involvement of those other entities in the prioritization process, rather just a prediction of the money, time, influence, and authority that they may provide collectively toward protection efforts.
Example: local willingness to change land uses and implement other nonpoint source activities (KS)
- **Economics**
Related to the availability of implementation support is prioritization based on economics, although this approach considers the projected cost of protection in addition to the availability of funds to accomplish it. At its simplest, this is “bang for the buck,” prioritizing waters offering the greatest chance of maintaining water quality and/or the greatest benefits (social or ecological) resulting from protection for the least cost. But it also can include consideration of how much financial support may be available and the likelihood of procuring it, from sources such as CWA 319 funds.

Current approaches to protection

A state, tribe, or territory may choose to prioritize the protection of healthy waters in a number of different ways, but in any case, the next step is determining how those waters that have been prioritized will be protected. Some options presently in practice are explained below.

- **Monitoring and analysis**
Identifying degradation in healthy waters is a valuable step in maintaining the quality of those waters, or at least ensuring that they continue to meet applicable water quality standards. This information can focus protection efforts and, as noted above, even be the foundation for prioritizing protection based upon the degree or nature of threat to water quality.
Examples: biomonitoing of healthy waters to detect degradation (KY); establishing Biological Condition Gradient models for various target species to identify negative trends in healthy waters (CT); a water quality analysis for a waterbody “on the cusp” of impairment (MD)
- **Waterbody classifications**
A state, tribe, or territory may require certain protective measures of healthy waters, such as significant restrictions on new or increased discharges to those waters, by giving them a specific classification.
Examples: using the water supply, high quality waters, and outstanding water resources classifications to protect healthy waters (NC); using the outstanding resource waters classification to protect healthy waters with outstanding socio-economic, recreational, ecological and/or aesthetic values (MA)

- **Planning**
Plans ideally guide subsequent actions and can thereby assist in the protection of healthy waters. These plans can focus on various issues, from identifying the preferred means and timing of development to coordinating multiple water quality protection efforts.
Example: watershed protection plans for areas with no identified impairments and TMDL implementation plans that include all waters, not just those that are impaired (TX)
- **Outreach program**
Public outreach can have a significant impact on the protection of healthy waters in practice. These efforts can attract community involvement in the development of preventive management strategies and, perhaps more importantly, in the implementation thereof.
Examples: Source Water Assessment and Protection program (CO); Drinking Water Protection Program (OR)

ALTERNATIVES

Goal: By 2018, states use alternative approaches, in addition to TMDLs, that incorporate adaptive management and are tailored to specific circumstances where such approaches are better suited to implement priority watershed or water actions that achieve the water quality goals of each state, including identifying and reducing nonpoint sources of pollution

Current approaches to alternatives

The Clean Water Act requires that TMDLs be developed for waters not meeting any applicable water quality standard due to a pollutant, but TMDLs may not always be the most efficient means of meeting water quality standards. Rather than assigning a high priority for TMDL development for some waters, states, tribes, and territories may assign those waters a lower priority for TMDL development as they pursue an alternative restoration approach to meet water quality standards in the near term. If the waterbody subsequently meets water quality standards, a TMDL will not need to be developed so long as standards continue to be met.

- **Straight to Implementation for Category 5 waters**
When the sources of pollution causing the use impairment have been identified and are few in number, proven management strategies to address the problem exist, and funds are available for implementation as well as for post-implementation monitoring, a state or territory may choose to address the problem directly, developing a TMDL later only if the effort does not succeed.
Examples: cattle exclusions from riparian corridors to address water quality standard exceedances in temperature, fecal coliform, DO, and pH (WA); egg oiling and goose roundups to address the water quality impacts of large goose populations (RI); state regulation of phosphorus in dishwasher detergents and lawn fertilizer (NY)
- **Restoration actions with plans for Category 5 waters**
When the opportunities for water quality restoration are not sufficiently simple to go straight to implementation but restoration may be more efficient without the development of a TMDL, a state or territory may choose to develop and execute a plan, developing a TMDL later only if the plan does not succeed. These plans can cover a wide range of sources, focus only on nonpoint sources, or concern a single type of source,

depending on what is needed to meet water quality standards for the waterbody and pollutant at issue. Some EPA regions have been piloting new subcategories within the Integrated Reporting Category 5 for waters with plans achieving certain qualifications, such as Category 5R in Region 4.

Examples: watershed-based plans under CWA 319; watershed implementation plans; approved conservation plans under the Agricultural Water Quality Certification Program (MN); Category 4R for waters impaired by a pollutant but with a restoration plan (FL)

- **Category 4b**

Category 4b contains waters impaired by a pollutant but that have “other pollution control requirements” stringent enough to achieve applicable water quality standards within a reasonable time period. Such listings must demonstrate the problem causing the impairment, the pollution controls and how they will achieve water quality standards, the predicted timeline for meeting water quality standards, the schedule for implementing pollution controls, the monitoring plan for tracking the effectiveness of pollution controls, and a commitment to revise pollution controls as necessary.

Examples: U.S. Army's restoration plan under CERCLA for Eagle River Flats (AK); NPDES permit-related waters (OH)

ENGAGEMENT

Goal: By 2014, EPA and the states actively engage the public and other stakeholders to improve and protect water quality, as demonstrated by documented, inclusive, transparent, and consistent communication; requesting and sharing feedback on proposed approaches; and enhanced understanding of program objectives

Current approaches to engagement

- **Councils/groups**

In-person discussions with stakeholders and the public provide valuable opportunities for state staff to disseminate information and receive input and feedback. Being in the form of a council or other type of group with a regular meeting schedule creates consistency in engagement. These groups can take many different forms, from purpose, to participant composition, to topical focus, to frequency of meetings.

Examples: Clean Water Council—composed of legislators and staff of state agencies and stakeholder organizations—makes biennial budget/policy recommendations to the legislature and governor (MN); work groups of Water Quality Control Division staff and stakeholders on specific water quality topics (CO); Basin Advisory Committees track issues, alert the state of problems, and serve as forums for community involvement (KS)

- **Meetings**

Some of the same objectives can be achieved and participants involved in less-structured, irregular or singular meetings as with councils or other groups. Meetings can be as large as conferences that cover many issues or be as specific as individual meetings with affected stakeholders. As with councils and other groups, meetings can have the engagement purposes of broadcasting information and/or receiving it.

Examples: ADEQ's Public Outreach and Assistance Division meets regularly with watershed groups, holds quarterly meetings, and hosts a biannual conference to engage stakeholders and keep them involved in the protection of water quality (AR); public

meetings and workshops throughout the listing, TMDL development, and restoration stages (FL); meetings, workshops, conferences, and webinars to provide local partners opportunities to learn about the Bay TMDL/WIP development process, express ideas and concerns, and provide local data and pollution reduction strategies (MD)

- **Field staff**

Stationing agency staff throughout the state can generate more opportunities for local engagement. Ideally these staff members are from the region assigned and build on their knowledge of the area and people. Their specific roles may include identifying and encouraging interest in improving local water quality and working with local stakeholders in restoring and protecting water quality through TMDL and stormwater programs, grant applications, and implementation.

Examples: TMDL Coordinators and Watershed Field Coordinators in regional offices (VA); Basin Coordinators deployed across the major river basins of the state (IA)

- **Listservs**

A state, tribe, or territory may choose to develop listservs as a means of disseminating information and generating discussion. While it lacks the in-person element of the preceding engagement methods, it is less costly and can reach more people. Listservs can be tailored to certain subsets of subscribers, perhaps most usefully providing the opportunity for easy dissemination of information about local water quality just to local subscribers and via a forum for community discussion of solutions.

Examples: listservs to disseminate information about water quality and associated activities (CT); subscriber listservs to receive news and other notices (MO); listserv to distribute Division related news (UT)

- **Publications**

Newsletters, factsheets, brochures, and reports still can be influential means of engaging stakeholders and the public. While detailed, lengthy documents offer much for decision-makers, summary documents in casual language better serve much of the population. Since publications are not forums for discussion, their function in terms of engagement is limited to disseminating information and eliciting subsequent actions and communication.

Examples: Watershed Health Reports convey the results of the TMDL division's work, show where improvement is needed, and highlight the strengths of the watershed (KY); Clean Water Fund Performance Report monitors the progress and effectiveness of protection and restoration efforts for 18 different measures through narrative and graphic summaries (MN); quarterly newsletter "Clearing the Waters" containing updates from several water quality divisions (NM)

- **Interactive mapping**

A great deal of water quality information can be conveyed via a digital map overlaid with data, allowing users a simpler, visually stimulating means of accessing desired information. Data layers can include water segment categorization in the Integrated Report, including what waters have been assessed and which have TMDLs developed for them; the designated use impaired; the pollutant exceeding the criteria standard; where implementation efforts are underway; and more.

Examples: a web-based interactive GIS map presenting assessment information (MA); Integrated Report web map searchable by waterbody name, ID, category, and use (NV)

- **Apps**

Water quality information can be easier to access on-demand, thus more likely to be used, via applications for smartphones and tablets. The same information available in a

report or interactive map can be made portable, in addition to searchable and non-technical.

Example: How's My Waterway app (EPA)

- **Websites**

Websites primarily are a means of disseminating information to the public, but they also can serve as a means of receiving feedback and crowdsourcing information. In addition to posting water quality data, Integrated Reports, and the status of implementation projects, a state, tribe, or territory may use its website to educate the public about water quality sampling and to collect water quality data from other sources, to receive reviews from stakeholders on draft documents, as a forum for discussion and the contribution of local information, to collect success stories, and more.

Examples: website with contact information, schedules and timelines, regularly updated notifications, and all relevant public documents (MO); website containing water quality monitoring and assessment methods, how to report and upload water quality monitoring data, the status of standards development and TMDL and 319 projects, draft TMDL documents and water quality data posted for the review of watershed advisory groups, and more (MT)

INTEGRATION

Goal: By 2016, EPA and the states identify and coordinate implementation of key point source and nonpoint source control actions that foster effective integration across CWA programs, other statutory programs (e.g., CERCLA, RCRA, SDWA, CAA), and the water quality efforts of other Federal departments and agencies (e.g., Agriculture, Interior, Commerce) to achieve the water quality goals of each state

Current approaches to integration

- **Integrated agency structure**

An agency's structure influences the integration of its programs. The more that programs such as monitoring, standards, assessment, TMDL, NPDES, and CWA 319 are collected under a single section, bureau, division, or unit within the agency, the more unified management is and the more connected staffs may be. In addition to the managerial hierarchy, agency structure can determine the location of offices, and physical proximity, whether the same office, floor, or building, can improve integration by creating opportunities for ad hoc discussions.

Examples: standards, monitoring, TMDL, NPDES, and CWA 319 program staff interact daily since they organizationally unified (KS); standards, assessment, TMDL, and NPDES staff are in the same division (LA); Surface Water Quality Management Program is responsible for monitoring, standards, assessment, TMDLs, CWA 319, the nutrient management strategy, and the Integrated Report (ND)

- **Dedicated agency position for integration**

Programs may task one or more staff members with spearheading integration efforts generally; with other specified programs, agencies, or governments; or for particular purposes such as incorporating TMDL information into CWA 319 grant decisions. The desired integration should be more likely with assigned responsibility than without it.

Examples: dedicated positions in the wastewater and stormwater programs for leading TMDL integration efforts in permits (MN); DEQ Tribal Liaison that works with the nine federally-recognized tribal nations in Oregon (OR)

- **CWA 319 elements incorporated into TMDLs**

Integration also can take the form of merging types of documents to make the result more useful to more parties, and ideally more effective. In this case, EPA has identified nine minimum elements to be included in a watershed plan for impaired waters financially supported through CWA 319 funds. By incorporating these elements into TMDLs, TMDLs can be used to support CWA 319 work plans without the need of producing additional plans.

Examples: the nine elements of a watershed plan are being incorporated into TMDLs (UT); testing a TMDL template that addresses the 319 program's nine elements (IN)

- **Multi-program coordination groups**

Programs can effectively integrate with one another, with other agencies, and with other governments through groups consisting of staff from each entity. The key to such groups is not only the knowledge of the participants but also their authority to implement agreed upon actions. A regular meeting schedule encourages consistency in integration efforts.

Example: Indiana Conservation Partnership with IDEM, IDNR, ISDA, NRCS, 92 soil and water conservation districts, and others (IN)

- **Multi-program meetings**

Integration among CWA programs and with other programs, agencies, and governments can benefit from meetings set for the purpose of improving integration and merely the participation of program staff in the meetings of other entities, and vice versa. Meetings provide an opportunity to better understand the objectives and approaches of other entities, to contribute information to their efforts, to gain information from them, and ideally to synchronize efforts where possible to improve efficiency.

Examples: routine meetings between state standards, assessment, monitoring, TMDL, NPDES, and CWA 319 programs to effectively and efficiently implement the CWA (AL); annual meeting with USFS watershed staff, hydrologists, and on-scene coordinators to review ongoing and upcoming projects (AZ); annual inter-agency coordination meeting between state and federal agency partners to share upcoming water quality related issues and coordination issues (UT)

- **Coordinated plans**

The development of plans offers an opportunity for programs, agencies, and other entities to identify synergies in objectives and develop strategies for addressing complex problems together. These plans can be common aspects of CWA programs, such as nonpoint source management plans, or unique efforts to solve a specific problem in a coordinated manner.

Examples: Nonpoint Source Management Plan developed by IDNR, state department of agriculture, NRCS, Iowa State, and soil and water conservation districts (IA); the Tactical Basin Planning Framework lays out an integrated process for developing individual basin-specific plans (VT)

- **Cooperative agreements**

Integration can be promised and planned in agreements among programs, agencies, and governments. While the agreements may not be binding on any party, they can serve as a source of good will and a foundation for future cooperative efforts.

Example: memoranda of understanding with BLM, USFS, and NRCS regarding processes and opportunities for interagency communication and collaboration to address water quality issues (MT)

- **Integrated databases**

Integration is not just about collaborative or mutually beneficial decision-making, but also the sharing of information on which such decisions are made. As technology improves, data can be more readily available and more easily sharable. Databases that collect and process information from multiple sources can be a building block for integrated management, as well as being valuable to each entity involved as it provides each with more information.

Examples: California Environmental Data Exchange Network aggregates water quality, aquatic habitat, and wildlife health data from many agencies and citizen groups and makes it available to everyone (CA); TMDL and NPDES programs maintain a database of TMDL requirements for permitting purposes (TX)

Appendices

Examples from practice of the approaches to achieving the respective goals of the Clean Water Act Section 303(d) Program Vision

APPENDIX A: Prioritization Examples

Current approaches to prioritization

- **Recovery potential**
 - The Massachusetts Department of Environmental Protection (Mass DEP) partnered with EPA in Fiscal Year 2011-2012 to develop a Recovery Potential Screening Tool to help identify priority projects with high restoration potential. MassDEP also worked with inter- and intra-agency partners to develop and implement synergistic strategies. The tool was used to identify HUC-12 sub-watersheds that are most highly recoverable. From that list, the watersheds showing high and medium-high recovery potential were selected and mapped compared to MS4 regulated areas and Water Quality Assessment Report maps. This enabled MassDEP to screen out the segments located in regulated areas as ineligible for CWA 319 funding. For the remaining water bodies, the Integrated List was examined to identify segments impaired by causes most likely to respond to nonpoint source best management practices and remediation efforts and target these for action.
 - The Maryland Department of the Environment's restoration strategy is two-pronged: 1) Target resources to waters that have a reasonable potential for removal from the CWA 303(d) list, which tend to be waters that are not too severely impaired or are special situations with high recovery potential and, 2) Target resources to waters that are severely impaired and for which restoration action is most likely to show measurable incremental improvement. These also tend to be places that are high loading sources to the Chesapeake Bay. The department is working with EPA on assembling data for further assessment using the EPA Recovery Potential Screening Method system. For each water or watershed, this method measures several ecological, stressor, and social context indicators associated with the likelihood of success of a restoration effort. Combined, these three indices form the Recovery Potential Integrated (RPI) score.
 - The New Hampshire Department of Environmental Services is adapting the Recovery Potential Screening Tool for use as a prioritization tool for restoration, protection, and funding.
 - The New Mexico Environment Department is working with consultant The Cadmus Group and EPA headquarters on a Recovery Potential Screening Tool for New Mexico to help prioritize waters.
 - The State of Hawaii Department of Health, Clean Water Branch has identified three priority watersheds that serve as the focus of TMDL implementation activities, CWA 319 projects, and increased monitoring efforts. These watersheds were selected because of the opportunities to achieve water quality improvements and the likelihood of achieving water quality goals by working with partners.
 - The Water Quality Division of the Wyoming Department of Environmental Quality prioritizes impaired waterbodies for TMDL development and implementation based on their potential for restoration, how well the water quality issue is understood, and how long the water has been listed.
 - North Carolina Division of Water Quality has its own restorability index for TMDL development which includes the following considerations: severity of the impairment, how long the water has been impaired, whether the water is within DWQ's Use Restoration Watershed program, public interest in assisting with implementation, ample data for modeling if required, and time availability for modeling.

- The Virginia Department of Environmental Quality recently developed a trend analysis with EPA as a pilot project to support new ‘incremental’ measures of water quality changes. This project uses a seasonal Kendall statistical analysis with an Integrated Water Quality Index to evaluate waters and prioritize those declining and improving the fastest.

- **Multi-agency team**
 - Alaska has a state multi-agency team that prioritizes waters of concern. Water quality concerns are represented by the state Department of Environmental Conservation, while water quantity issues are represented by the Department of Natural Resources and habitat issues are covered by the Department of Fish & Game. The group uses a standard review process to rank waters as high, medium, or lower. The prioritization process addresses protection as well as restoration issues.
 - In Texas, the Watershed Action Planning Process brings together the Texas Commission on Environmental Quality (TCEQ), the Texas State Soil and Water Conservation Board (TSSWCB), and the River Authorities (RAs) to discuss, plan, and prioritize water bodies on the CWA 303(d) list. Discussions during meetings include evaluating potential strategies, identifying lead entities, and prioritizing water bodies.
 - The Montana Department of Environmental Quality, Natural Resources Conservation Service, Bureau of Land Management, U.S. Forest Service, and others are actively working to identify watersheds at the 12-digit HUC level where restoration priorities overlap, in order to provide adequate technical and financial resources to effect lasting changes in watershed health.
 - The Louisiana Department of Environmental Quality has created an interagency team comprised of the Coastal Protection and Restoration Authority of Louisiana, Louisiana Department of Agriculture and Forestry, and the Louisiana Department of Natural Resources, in addition to its own department, to develop and implement the state’s nutrient management strategy, part of which is prioritizing waters of concern for protection and restoration efforts.
 - The Colorado Water Control Division makes prioritization decisions with the involvement of other agencies relevant to a given situation, such as the Colorado Division of Reclamation, Mining and Safety, for mining impaired projects.
 - The Arizona Department of Environmental Quality is creating a prioritization scheme for the development and implementation of TMDLs. Prioritization will be a collaborative effort between the CWA 319 and TMDL programs in the state, with input from local watershed stakeholders. Waters will be ranked for one of the three approaches: develop an integrated TMDL/Watershed Improvement Plan, develop a TMDL-like document that is not as detailed as a TMDL, and moving directly to implementation without a TMDL.

- **Public input**
 - The Alaska Department of Conservation’s prioritization scheme begins with public input. Through an online system and over the phone, the public nominates water bodies to be prioritized. Any water body, impaired or healthy, may be nominated, which connects the prioritization of protection and restoration activities. But one of the drawbacks of the method is that there may not be any data available for a nominated water body – meaning it will have to stay in a lower category in the short term.

- In Connecticut, the Department of Energy and Environmental Protection holds a public review process for the CWA 303(d) list. Public comments are particularly relevant to the process of establishing priorities for the development of TMDLs and other management plans for impaired waters included in Categories 4 and 5.
- **Availability of implementation support**
 - The most significant factor in the prioritization of waters in Iowa is sustained citizen interest in restoring the waterbody.
 - The primary prioritization consideration for the Nevada Division of Environmental Protection is that the watershed has stakeholder interest to address nonpoint source problems.
 - In addition to the number of impaired waterbodies in a given watershed, the Illinois Environmental Protection Agency prioritizes watersheds based on the interest level of watershed groups and stakeholder involvement in TMDL development.
 - In Kentucky, prioritization historically has been given to areas with stakeholders so that the program could be certain implementation dollars would be spent on the ground.
 - In South Carolina, local interest in restoration via CWA 319 implementation projects is considered during prioritizing and scheduling TMDL development.
 - The Colorado Water Control Division is in the beginning stages of developing implementation plans for completed TMDLs in conjunction with the CWA 319 program. The first stage is prioritization based on the involvement of other agencies (e.g. Colorado Division of Reclamation, Mining and Safety, for mining impaired projects) in addition to the feasibility of meeting water quality standards and other parameters.
 - In Kansas, the CWA 303(d) program spends a portion of its time seeing that developed nutrient TMDLs are being incorporated within CWA Section 319 watershed plans and used in establishing NPDES permit conditions and limits.
- **Economics**
 - In Minnesota, Watershed Restoration and Protection Strategies (WRAPS) help guide the water plans of local governments. WRAPS include targeting data, along with information from stressor identification, modeling and TMDL reports, to help local governments select and install BMPs in areas where they will yield the biggest bang for the buck.
 - Iowa's TMDL program prioritizes lake impairments because there is economic research to support the value of lakes to citizens, and lake watersheds are normally at a scale for which the CWA Section 319 program can effect positive change in a reasonable time frame. Iowa recently began prioritizing river basins as well, to take advantage of the water quality monitoring efficiencies and save money.
 - In Utah, implementation efforts on TMDL waters are focused partly on contiguous stream reaches within smaller 12-digit watersheds to achieve measurable results with the limited funds available.
- **Nutrient Framework Memo**
 - Since fall 2012, the Kansas Department of Health and Environment (KDHE) has determined its 16 highest priority HUC-8's, pursuant to the EPA memo *Working in Partnership with States to Address Phosphorus and Nitrogen Pollution through Use of a Framework for State*

- Nutrient Reductions.* This led KDHE to look at the stream total phosphorus and lake eutrophication impairments in those HUC-8's and make them the basis for scheduling TMDL development over the next 8 to 10 years. KDHE likely will only complete nutrient-related impairment TMDLs in 6 of Kansas' 12 major river basins between 2013 and 2022. KDHE also will spend a portion of its time ensuring that developed nutrient TMDLs are being incorporated within CWA 319 watershed plans and used in establishing NPDES permit conditions and limits.
- The Division of Water in the North Dakota Department of Health has initiated a planning process with the goal of developing a state nutrient reduction strategy. This strategy, which is in response to the Nutrient Framework Memo, includes watershed prioritization as a key component. The Division has outlined various options for setting watershed priorities and is in the process of forming a technical workgroup focused on developing a water prioritization process which will be part of the nutrient reduction strategy.

Current approaches regarding what to prioritize

- **Pollutants**
 - Kansas prioritizes stream total phosphorus and lake eutrophication
 - Massachusetts prioritizes bacteria and nutrients
 - Idaho prioritizes nutrients and temperature due to nonpoint sources
 - Colorado prioritizes selenium and other pollutants from mining
 - Louisiana prioritizes dissolved oxygen and minerals

- **Impacts/uses**
 - In Missouri, waters are prioritized for TMDL development based on, among other things, the human health risk posed by the impairment.
 - In Connecticut, waters are prioritized for TMDL development based on threats to human health as well as the potential for a TMDL analysis to result in improved water quality, provide support to regulatory programs designed to improve water quality, and comments received during public review of the proposed CWA 303(d) list.
 - In Massachusetts, TMDL development for waters not meeting bacteria standards is prioritized based on human health considerations such as proximity to shellfish areas and public swimming areas.
 - The Michigan DEQ has started prioritizing subwatersheds within TMDL areas based on stress to the subwatershed from agricultural practices, land development, human population, on-site sewage treatment, etc.

- **Sources**
 - The Colorado Department of Public Health and Environment prioritizes water quality impairments caused by abandoned/legacy mines.
 - BayStat, Maryland's program for assessment, coordination, and reporting of statewide Chesapeake Bay restoration efforts, will annually implement a geographic targeting of watersheds that are both in greatest need of nonpoint source pollution reduction for local water quality conditions and which have the greatest water quality impacts on the

- mainstem of the Chesapeake Bay, thus prioritizing the efforts of the Maryland Department of the Environment on an iterative basis.
- In Maine, agricultural and urbanized watersheds were evaluated separately to identify the highest nutrient loading areas. For urban watersheds, developed lands were analyzed, while agricultural watersheds were separated into cropland and animal production systems.

APPENDIX B: Assessment Examples

Current approaches to assessment

- **Focus monitoring on unassessed waters**
 - In Colorado, efforts to increase the scope of assessed water bodies have been done in part by identifying areas that are lacking data historically (i.e. high alpine lakes). Beginning in 2005, lake sampling events have at least doubled (on average), both in the number of unique lakes visited and the frequency of visits in a sampling season. Also, measureable results efforts to further identify sources of impairments and the overall impact of water quality improvement projects have also been implemented over the past couple of years.
 - The Maryland Department of the Environment is currently working with its state partners to restructure monitoring programs to ensure that currently unassessed waters receive adequate sampling coverage to make Integrated Report assessments. One example of this is with the Chesapeake Bay benthic monitoring program. Here, the department is apportioning more sites to segments that have historically had samples sizes not meeting the minimum requirement.

- **Probabilistic monitoring**
 - The North Carolina Division of Water Quality started the Random Ambient Monitoring System (RAMS) in 2007. Under RAMS, approximately 30 sampling locations are randomly selected and monitored monthly for two years. The division's ambient monitoring network historically focused on large rivers and areas with known water quality problems. As a result, the ambient program does not have much data on smaller streams. Most streams in North Carolina are small, so the majority of RAMS sites are on small streams. RAMS allows the division to answer broad questions about the water quality of North Carolina streams with a statistical rigor that had not been possible before. RAMS also allows the division to collect data on water quality parameters that are rarely examined. Finally, when a large modeling project is planned, additional data are collected to support modeling and further identify the extent of impaired waters in the project area.
 - In Kentucky, probabilistic biomonitoring is used to provide a statistical overview of the percentage of supporting and nonsupporting Wadeable streams in each basin management unit. This statistical design is employed each year to build a database from which a potential trend can be observed. Through the TMDL program, each waterbody or segment that is listed as not supporting a designated use results in watershed monitoring to determine the extent of impairment and sources.
 - The Virginia Department of Environmental Quality added probabilistic monitoring networks to its estuarine monitoring program in 2000 and its freshwater monitoring program in 2001 in an effort to better address statewide and regional questions about water quality. The sampling points for probabilistic monitoring were generated by USEPA using a design similar to the Environmental Mapping and Assessment Program. The state samples 50 to 60 randomly selected sampling points per year for a variety of chemical, biological, and habitat parameters.
 - In Michigan, a probabilistic monitoring-based macroinvertebrate sampling program has allowed statistical assessment of 100% of streams and rivers in each watershed.

- The Kansas Department of Health and Environment has used the data from probabilistic surveys to get intra-watershed information on which stream reaches within an assessed watershed (as monitored by a pour point station) may or may not be contributing to the impairment identified at the pour point.
 - Probabilistic monitoring in North Dakota primarily occurs through the National Aquatic Resource Surveys, from the National Wetland Condition Assessment in 2011, to the National Lake Survey in 2012, and now to the National River and Streams Assessment in 2013 and 2014.
 - The Arizona Department of Environmental Quality's Ambient Monitoring Program has participated in probabilistic monitoring. The data collected has been used in the CWA 305(b) assessments, but the statistical results for these surveys have not been incorporated into the CWA 305(b) report.
- **Targeted monitoring**
 - The Indiana Department of Environmental Management (IDEM) has looked for areas where separate program goals overlap, and targeted monitoring and other resources to evaluate those waters. For example, where probabilistic sampling indicates impairments, IDEM reviews other factors such as the existence of active watershed groups and installed BMPs to determine which areas to target for intensive sampling in order to better understand the extent of impairment and the potential to affect water quality improvements.
 - Montana Department of Environmental Quality prioritizes significant resource development areas in their monitoring program. The state is currently assessing waters to define baseline and potential impairment conditions in areas of significant natural resource development. Focus is on areas of oil production via hydraulic fracturing and areas where coal bed methane development is anticipated.
- **Rotational monitoring**
 - The Minnesota Pollution Control Agency's has begun a 10-year cycle of chemical, physical, and biological stream monitoring and lake chemistry (at a rate of 8 HUC-8 watersheds per year) on all 81 major watersheds in the state, the first cycle to be completed in 2017. Watershed assessment and monitoring reports are a product of this process.
 - The New York Department of Environmental Conservation assesses the waters of its major drainage basins on a five-year cycle, two to four major drainage basins each year.
 - The Maine Department of Environmental Protection has divided the state into five regions, which are assessed annually on a five-year rotating schedule.
 - The Virginia Department of Environmental Quality uses an ambient watershed monitoring program that is designed to cover the state over a six-year-period. Over this time frame, each of state's river basins is monitored for two years on a bimonthly basis, with a subset of stations being monitoring every year for the purposes of long-term trend analysis.
 - The Massachusetts Department of Environmental Protection, Division of Watershed Management's traditional monitoring program was based on a five-year rotating cycle. Using this approach, the state has assessed about thirty percent of its waters.
 - The Division of Surface Water at the Ohio Environmental Protection Agency uses a rotating basin schedule for monitoring waterbodies.

- In Oklahoma, funding from the CWA 319 program since the mid-1990's has allowed monitoring of 250 sites on a rotating basin program, in addition to 100 sites in a volunteer monitoring program.
 - The State of Utah, Department of Environmental Quality has established a six year rotating basin approach for monitoring and funding nonpoint source projects. Intensive monitoring occurs in years one and six and funding is targeted to address water quality impairments identified through approved TMDLs in year three.
- **Use of data from volunteer monitoring and other sources**
 - In Montana, volunteer monitoring groups have been trained in sampling protocols and quality assurance by state Department of Environmental Quality staff in conjunction with the Montana Watershed Coordination Council and the Montana State University extension office to produce high quality data that is used by the department and other entities. The data gathered by these volunteer groups has helped Montana improve the completeness of its CWA 303(d) list of impaired waters. In addition, the department uses water quality data from other agencies and entities, such as the U.S. Forest Service, USGS, and private industry.
 - The Utah Department of Environmental Quality has initiated a volunteer monitoring program called Utah Water Watch to increase the state's capacity to collect water quality samples throughout the state and assist in expanding the database of available information for assessment purposes.
 - In Arizona, the Master Watershed Steward Program, a partnership of the University of Arizona Cooperative Extension and the Arizona Department of Environmental Quality, educates and trains citizens across the state to serve as volunteers in the monitoring, restoration, conservation, and protection of their water and watersheds.
 - In Virginia, alliances with citizen monitoring groups have expanded the monitoring reach of the state.
 - In Illinois, lake monitoring volunteers provide valuable monitoring data.
 - In Minnesota, a volunteer monitoring program for lakes and streams supplies additional data.
 - The Vermont Department of Environmental Conservation has benefitted from expanded lay monitoring through the state water quality lab.
 - The New York Department of Environmental Conservation recently began trying to incorporate citizen monitors into the monitoring program.
 - In California, the Clean Water Team (CWT) is the citizen monitoring program of the State Water Resources Control Board and provides training, technical assistance and guidance documents, QA/QC support, and temporary loans of equipment to citizen monitoring groups.
 - Over the last several years, the Michigan Department of Environmental Quality has increased its use of external data, such as those from the Fisheries Division of the Department of Natural Resources and volunteer information, to increase the number of assessed waters.
 - In Kansas, diminished resources have made data from the USGS or the state's universities a valuable supplement to the monitoring efforts of the Department of Health and Environment.
 - The Idaho Department of Environmental Quality benefits from data from collected by other state agencies, municipalities, universities, the U.S. Forest Service, and the U.S. Bureau of Land Management.

- In Puerto Rico, other government agencies, members of the public, and academic institutions provide water quality-related data.
 - In Alabama, annual workshops and meetings held between all state water programs have provided greater efficiency in the state's monitoring program, thus expanding its ability to truly assess the condition of more waters.
- **Improved databases**
 - The California Environmental Data Exchange Network (CEDEN) aggregates water quality, aquatic habitat, and wildlife health data from any agency, group, or individual collecting such water quality information. CEDEN makes this data accessible to environmental managers and the public through the website. The website also provides information about preparing and submitting data, and regional data centers provide personalized assistance in assessing data and developing a submission strategy.
- **Improved assessment process**
 - In New Mexico, the Surface Water Quality Bureau is using R-studio to develop an automated assessment process and is integrating ADB with the assessment database in order to improve efficiency in the assessment process. Building additional automated quality assurance tools into the in-house water quality database was set out as a priority initiative in the Surface Water Quality 10-year Monitoring and Assessment Strategy, released in 2010.
 - The Texas Commission on Environmental Quality has invested a great deal of resources in the development of databases and assessment tools capable of evaluating large amounts of data to develop the Integrated Report every two years.
 - Over the past few years, the Montana Department of Environmental Quality has created updated assessment processes to refine impairment and non-impairment determinations. These assessment processes define minimum data sets and data quality requirements as well as sample collection procedures. The processes are focused on the most common pollutant impairment causes found in Montana (nutrients, metals, sediment, and temperature) and address interpretation of both narrative and numeric water quality standards. This work has been conducted in parallel with the state's effort to develop numeric nutrient standards. Although not yet complete, the nutrient standards work has provided an updated narrative nutrient standards translation used for assessments and TMDL development. The overall improvement to assessment methods significantly improves the department's ability to expand the number of assessed water bodies in Montana.

APPENDIX C: Protection Examples

Current approaches to prioritizing protection

- **Multi-agency team**
 - Alaska has a state multi-agency team that prioritizes waters of concern. Water quality concerns are represented by the state Department of Environmental Conservation, while water quantity issues are represented by the Department of Natural Resources and habitat issues are covered by the Department of Fish & Game. The group uses a standard review process to rank waters as high, medium, or lower. The prioritization process addresses protection as well as restoration issues.
 - The Louisiana Department of Environmental Quality has created an interagency team comprised of the Coastal Protection and Restoration Authority of Louisiana, Louisiana Department of Agriculture and Forestry, and the Louisiana Department of Natural Resources, in addition to its own department, to develop and implement the state's nutrient management strategy, part of which is prioritizing waters of concern for protection and restoration efforts.

- **Input from other agencies and the public**
 - In New York, protection planning priorities have been largely driven by EPA priorities for implementation of the Clean Water Act and response to grass roots water quality concerns.
 - Oregon Department of Environmental Quality basin coordinators participate in local prioritization processes with partners such as the Oregon Water Science Center and Natural Resources Conservation Service and present water quality information, including analysis done for TMDLs. Some of these efforts have led to protecting certain areas that would not otherwise have been addressed.
 - The Massachusetts Executive Office of Energy and Environmental Affairs has worked with communities and other stakeholders in a collaborative planning effort to identify priority areas for protection as well as priority areas for development in the Metro West region of the state.

- **Degree or nature of threat to water quality**
 - In New York, "stressed" waters have long been tracked to identify priorities for protection before a water body is impaired.
 - The Maryland Department of the Environment has targeted additional monitoring efforts to those healthy watersheds most threatened by current or future planned development. Part of this effort has involved performing an assimilative capacity analysis to determine which healthy watersheds have limited capacity to assimilate additional pollutants. This targeted monitoring serves as an early warning system allowing Maryland to proactively identify and address declining trends in water quality.
 - The Utah Department of Environmental Quality currently relies upon the CWA 401 certification process to establish protection priorities.

- **Availability of implementation support**
 - The Kansas Department of Health and Environment recently completed a Healthy Watershed Initiative grant project examining how to characterize and potentially protect heritage streams flowing out of healthy watersheds in Kansas. The results indicated there were several regulatory tools that could be used for permitted activities, but land use changes and other nonpoint source activities were managed through local willingness to put practices in place, often without the assistance of government. A protection-based TMDL for a healthy stream system has been completed with the cooperation of a local watershed district.

Current approaches to protection

- **Monitoring and analysis**
 - In Kentucky there are designated protection areas for sensitive drinking water sources. For healthy waters, the Division of Water maintains a biomonitoring effort of the reference reach water bodies to assure their biological and physical integrity is intact or note any degradation as early as practical.
 - The Maryland Department of the Environment has developed a water quality analysis for a waterbody “on the cusp” of impairment, with the understanding on the part of the local jurisdiction that they will develop a watershed management plan to prevent it from becoming impaired.
 - The Connecticut Department of Energy and Environmental Protection has a multi-pronged approach to waters which are not impaired. This includes targeted monitoring, work to support national Wild and Scenic designations, working to establish Biological Condition Gradient models for various target species (e.g. invertebrates, fish (almost done), and periphyton (future)) with the intent of better tracking water quality trends to identify any negative trends as soon as possible before the water body becomes impaired. The state also includes entire watersheds within TMDL evaluations and highlights any data and loadings that indicate that water quality is better than required. Finally, the state is working to develop a method to identify High Quality and Outstanding Resource Waters on a statewide basis.
- **Waterbody classifications**
 - The North Carolina Department of Water Quality primarily uses water supply, high quality waters, or outstanding water resources waterbody classifications to protect healthy waters. These classifications require higher levels of protections than others.
 - Massachusetts DEP supports a robust baseline monitoring program. Certain waters are designated in the Surface Water Quality Standards (SWQS) for Protection as Outstanding Resource Waters (ORWs). These waters include Class A Public Water Supplies and their tributaries, certain wetlands, vernal pools, areas of critical environmental concern and other waters, which are determined by the Department based on their outstanding socio-economic, recreational, ecological and/or aesthetic values. The regulations require that the quality of these waters be protected and maintained. Except in extremely limited circumstances, new or increased discharges are prohibited in waters designated as ORWs in

- the SWQS. Many regulations piggy back off of the special designations of ORWs, cold water fisheries and shellfish areas, in order to protect existing uses.
- Montana state statute (75-5-316 MCA) and administrative rules (17.30.617 ARM) afford special protection to surface waters located wholly in the boundaries of designated national parks or wilderness areas, as of October 1, 1995. These waters are designated as Outstanding Resource Waters (ORWs). The state statute also provides a process for additional waters to be designated as an ORW. This process requires approval by the Montana legislature for each designation. To date there have been no additional ORW designations. Because existing ORWs are located in areas with essentially no pollution sources, there is little need to prioritize protection activities for these waters.
 - The South Dakota DENR has a water quality standard that allows a water body of high quality or exceptional recreational or ecological significance to be designated as an Outstanding State Resource Water. This designation ensures water quality will be maintained and protected. These water bodies are nominated and the designation is approved by the state Water Management Board. Although South Dakota does not currently have any water bodies with this designation, the standard is in place to allow increased protection for healthy water bodies.
 - The Pennsylvania Department of Environmental Protection has a healthy waters program through the implementation of its antidegradation program. The healthy waters program identifies high quality and exceptional value (special protection) waters.
- **Planning**
 - In Texas, a number of mechanisms have been implemented which protect healthy waters. Watershed Protection Planning activities have been developed for areas where there are no identified impairments. Also, TMDL implementation plan (I-Plan) activities consider the entire watershed so that protection activities implemented through the I-Plan include all waters, not just impaired water bodies.
 - **Outreach program**
 - The Oregon Drinking Water Protection Program is a partnership between the state Department of Environmental Quality and the Oregon Health Authority. The program provides the public with information about drinking water and encourages community-based protection and preventive management strategies to minimize risks to public drinking water resources from future contamination. The program also conducts source water assessments throughout the state and uses the information to identify protection priorities.
 - Colorado Source Water Assessment and Protection (SWAP) is a program designed to provide the general public with information about its drinking water, as well as a way to get involved in protecting drinking water quality. According to the Colorado Department of Public Health and Environment, “The program encourages community-based protection and preventive management strategies to ensure that all public drinking water resources are kept safe from future contamination.” SWAP has just entered its second and final phase, which is geared towards source water planning and protection. In the initial assessment phase, monitoring was done to uncover where each public water system’s source water comes from, what potential contaminants are present, and how susceptible the water is to these contaminants. In the protection phase, public water systems and communities are encouraged to use this information, and, with help from the Division, implement a

protection plan template. The state Water Quality Control Division and Colorado Rural Water Association developed these templates to simplify the process for public water suppliers, allow for flexibility in different scenarios, and help ensure that the necessary elements of a protection plan are in place. The plans also encourage public involvement and regular updating.

APPENDIX D: Alternatives Examples

Current approaches to alternatives

- **Straight to implementation for Category 5 waters**
 - The Washington Department of Ecology has addressed water quality standard exceedances in temperature, fecal coliform, DO, and pH caused solely by livestock by providing financial support for riparian corridor fencing, offstream watering, and other means of excluding cattle from the impaired streams. Several of these waters now meet water quality standards and reside in Category 1.
 - In Rhode Island, egg-oiling workshops and goose round-ups and killings (with the meat going to shelters) have been used address the water quality impacts of large goose populations.
 - On January 1st, 2012, a new law came into effect in New York State regulating the phosphorus content of dishwasher detergents and lawn fertilizer. The law prohibits the use of phosphorus in lawn fertilizer except in certain situations, prohibits fertilizer application to impervious surfaces and near surface water, and requires retailers to post educational signs about phosphorus fertilizers. The law also prohibits the sale of dishwasher detergents containing phosphorus for household use. New York became the seventeenth state to enact a law that requires phosphorus-free household detergents, joining Illinois, Indiana, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, Ohio, Oregon, Pennsylvania, Utah, Vermont, Virginia, Washington, and Wisconsin. Lawn fertilizer controls have also been adopted by Florida, Maine, Minnesota, and Wisconsin.
 - Following an algae bloom in Lake Mead in 2001, the Las Vegas area wastewater effluent dischargers voluntarily agreed to implement year-round phosphorus removal, even though the 1989 TMDL only called for seasonal removal. No problem algal blooms have occurred since. In addition, CWA 319 funds have been used in Nevada to implement grazing management, bank stabilization, riparian restoration, and other efforts on impaired streams that did not need TMDLs for source characterization.
 - Oregon Pesticide Stewardship Partnerships bring together the Oregon Department of Environmental Quality, the University of Oregon Extension Service, the Oregon Department of Agriculture, and the Oregon Department of Forestry to work with landowners and growers, conservation districts, and other stakeholders to reduce pesticide runoff to the state's waters. Using local expertise and water quality sampling results, the partnerships share their findings and provide context to encourage voluntary changes in pesticide use and management practices and help stakeholders identify, implement, and monitor those changes. The ultimate goal is to see measurable improvements in water quality through reduced pesticide levels and improved crop management, making the state's waters safer for humans and aquatic life.
 - In Ohio, CWA 319 requests for proposals are focused on actions that have proven successful in TMDL implementation in other areas, possibly eliminating the need for a TMDL and moving immediately to implementation. Follow-up monitoring as part of CWA 319 projects has been helpful in identifying which projects are successful.
 - The West Virginia Department of Natural Resources has been addressing the water quality impacts of acid precipitation through a program of limestone addition (perpetual), which has delivered successful brook trout restoration in multiple waters.

- **Restoration actions with plans for Category 5 waters**
 - The Minnesota Agricultural Water Quality Certification Program was formed through a partnership between the Minnesota Department of Agriculture, the Minnesota Pollution Control Agency, the Minnesota Board of Water and Soil Resources, the Minnesota Department of Natural Resources, the U.S. EPA, and NRCS. The goal of this program is to enhance Minnesota's water quality by accelerating the voluntary adoption of on-farm conservation practices. In exchange for Minnesota farmers' voluntary implementation and maintenance of approved conservation plans, the Certification Program will provide assurance that the farmers' operations meet water quality goals and standards for a specified time (likely 10 years).
 - The Iowa Department of Natural Resources has developed a Lake Restoration Program, focused on restoring impaired lakes. This can, according to the plan, be done without a TMDL. The Iowa Department of Natural Resources begins the process by developing a list of significant publicly owned lakes to be considered for funding. The department then meets with representatives from the communities on the lakes to provide an initial assessment and explain the funding process. Where there is a high potential for restoration and strong community interest and involvement, a joint action plan is developed. These plans must, at the minimum, document the causes, sources and magnitude of impairment, evaluate the feasibility of restoration options, establish water quality goals and schedules, assess the economic benefits of the project, identify the sources of funding, and describe community commitment to the project. The ultimate goals of the program are to address impairment in a cost-effective, community-based, sustainable way that results in improved water clarity, safety, and quality and the water's removal from the impaired waters list.
 - The New Hampshire Department of Environmental Services has completed watershed-based plans in the absence of TMDLs to quantify load reductions to meet water quality goals and recommend specific BMPs to achieve those load reductions. The department has been successful in watersheds where there is local capacity and resources to follow through on the plan recommendations.
 - In Wisconsin, watershed plans have been developed for a majority of the watersheds that have listed waterbodies. These plans were created by local stakeholders and provide many of the nine key elements that are required in a watershed-based plan. This approach has created a multitude of implementation projects throughout the state and in two instances impaired waterbodies have shown water quality improvement and are in the process of being evaluated for removal from the CWA 303(d) list.
 - The Georgia Environmental Protection Division is working with the U.S. EPA and South Carolina Department of Health and Environmental Control to develop a restoration plan with stakeholder involvement as an alternative to a typical TMDL for the Savannah harbor.
 - In Florida, Reasonable Assurance Plans allow stakeholders to set water quality targets and select the efforts to achieve attainment of those targets.
 - In 2011, EPA Region 4 launched a six-year pilot for listing impaired waters in Subcategory 5r. The subcategory was developed to encourage and support local restoration efforts done in advance of TMDLs. Like Category 4b, 5r allows states to work with stakeholders to develop a watershed restoration plan without the need for a TMDL. They also both ask states to identify the types of water quality controls and mechanisms needed, but 5r does not require that states demonstrate the adequacy of each of these implementation mechanisms and water quality controls. This allows states the flexibility to modify their mechanisms should they prove insufficient for implementing or maintaining the water quality controls. Region 4 has pledged to work with each state during the 5r piloting process to help select projects,

document requirements, set expectations, and track progress. Each state in the region is encouraged to pilot two watershed restoration projects using the 5r approach.

- **Category 4b**

- The Alaska Department of Environmental Conservation (ADEC) placed Eagle River Flats on its 1996 and 1998 CWA 303(d) lists for violating the toxic and other deleterious organic and inorganic substances water quality standard. White phosphorus particles from munitions in the nearby military base had built up in the sediments, causing the deaths of many waterfowl. In 2002, ADEC moved the waterbody to Category 4b based on EPA's approval of the U.S. Army's restoration plan through CERCLA. The Army successfully sublimated the white phosphorus, and as a result ADEC removed toxic and other deleterious organic and inorganic substances from the list of impairments in 2008.
- The Ohio Environmental Protection Agency uses Category 4b for some waters where sufficient pollutant reductions can be made through NPDES permits to meet water quality standards.
- Connecticut's Department of Energy and Environmental Protection has used Category 4b for several water bodies impaired due to industrial releases and the issue is being addressed through the ecological risk assessment process associated with site remediation activities.
- The Texas Commission on Environmental Quality has used Watershed Protection Plans that meet specified guidelines as a justification for moving impairments from Category 5 to Category 4b.
- North Carolina recently introduced the opportunity for local governments to use Category 4b to bypass the formal TMDL planning process and instead immediately develop programs to clean up the waterbody at issue.

APPENDIX E: Engagement Examples

Current approaches to engagement

- **Councils/groups**
 - In Minnesota, the Clean Water Council was created through the Clean Water Legacy Act to advise the legislative and executive branches of state government on the administration and implementation of the Clean Water Legacy Act. The Clean Water Council fosters coordination among public and private entities, develops education and participation strategies for stakeholders and the public, prioritizes strategies for TMDLs and restoration and protection activities, and develops processes for scientific review. It is composed of 23 members representing state agencies, water stakeholder organizations, and legislators.
 - In Colorado, work groups of state staff and stakeholders have formed via the Colorado Water Quality Forum to discuss key water quality issues, with the objective of reaching consensus, and if not that, better identifying where disagreement remains. The work groups often assist the Water Quality Control Division in determining positions for rulemaking proceedings. Work groups current exist regarding: CWA 303(d) listing methodology, permitting, MS4s, arsenic standards, drinking water regulations, E. coli, onsite wastewater treatment system management, discharger specific variance, practical quantification limits guidance, design criteria for potable water systems, HB1119 construction stormwater compliance, and water reuse.
 - In Kansas, each of the 12 major river basins has a Basin Advisory Committee (BAC) that links state programs with local issues. First established in 1985 but restructured in 2006, BACs are citizen advisory groups responsible for tracking issues and alerting the Kansas Water Office and Water Authority when concerns arise within any of the basins. In addition to providing this insight and advice to state organizations, BACs also serve as a forum for community involvement. Each BAC is responsible for determining the optimal number of members and for picking categories on which to provide maximum citizen input. These are chosen from the “core” categories of agriculture, conservation/environment, fish and wildlife, industry/commerce, municipal public water suppliers, recreation, and one slot for an at-large public member. BACs have been valuable in helping the Kansas Department of Health and Environment sort out priorities for TMDL implementation. They also are a captive audience for the reviewing the CWA 303(d) list and TMDLs. While general public meetings/hearings typically have not generated much interest in Kansas, BAC meetings and follow up meetings with interest groups (municipalities, Farm Bureau) who are represented on the BAC generate good discussion.
 - In 2009, the North Dakota Department of Health brought together representatives from NGOs and state and federal agencies to form the North Dakota Water Monitoring Council, which works to promote and facilitate collaboration, communication, and coordination for the successful collection, analysis, and sharing of water quality data. The Water Monitoring Council meets twice a year, with water quality topics of interest sent out via e-mail on an as-needed basis. Since being formed, it has set up a website and held its first water quality monitoring conference in February of 2012. Ongoing activities include forming working groups as issues with North Dakota's surface waters arise, and preparing for the second conference, to be held in 2014.
 - The Montana Watershed Coordination Council (MWCC) was formed in the early 1990s by staff from state and federal agencies in an effort to share information and increase the

effectiveness of meetings and overlapping membership between groups working with water issues. Soon thereafter, Organizational Operating Guidelines were also established and federal, state, and local natural resource agencies and organizations in Montana signed an MOU to “establish a framework for cooperation and coordination to sustain ecosystems, watersheds and communities in Montana.” Today, the mission of the MWCC is “to enhance, conserve, and protect natural resources and sustain the high quality of life in Montana for present and future generations using a collaborative watershed approach.” Current membership includes Montana’s conservation districts, watershed groups, conservation groups, state and federal agency staff, educational institutions, and private individuals. MWCC provides educational events, peer networking, technical/financial assistance, project tours, water quality monitoring assistance, staffing support, a weekly e-newsletter, and a host of other resources.

- In Illinois, the Fox River Study Group (FRSG) was founded in 2001 to prepare for the TMDL study on the river. The focus of the FRSG today is coordinating volunteer monitoring efforts and implementing and maintaining the watershed model as a management tool. The FSRG is a diverse coalition of stakeholders, including the Illinois EPA, municipalities, water reclamation districts, nonprofit organizations, and interested citizens. Similar groups in Illinois include the Hickory Creek Watershed Planning Group and the DuPage River Salt Creek Workgroup.

- **Meetings**

- The Public Outreach and Assistance Division of the Arkansas Department of Environmental Quality holds quarterly meetings as well as meeting regularly with watershed groups throughout the state. It also hosts a biannual conference to engage stakeholders and keep them involved in the protection of water quality. All of this is in addition to biennial public meetings regarding the proposed CWA 303(d) list and triennial listening sessions regarding the review of the water quality standards.
- Through numerous notifications, meetings, workshops, conferences, and webinars, the Maryland Department of the Environment has led an inter-agency campaign of public outreach and participation in the Chesapeake Bay TMDL/Watershed Implementation Plan (WIP) development process to ensure that local partners in Maryland’s counties and municipalities have had many opportunities to learn about this process, express their own ideas and concerns, and provide key local data and pollution reduction strategies, upon which Maryland has based its Phase II WIP.
- The Nonpoint Source Program of the Montana Department of Environmental Quality has sponsored numerous gatherings of various stakeholders to engage them in water quality protection and restoration, including two state stormwater conferences and a third being planned for 2014.
- In Iowa, whenever the Department of Natural Resources completes a draft version of a Water Quality Improvement Plan, the public has the opportunity to review the draft document and make comments. This can be done in writing or at a public meeting, held by the DNR and partner groups near the middle of the public comment period. The department responds to all comments received during the public comment period and includes them in the Water Quality Improvement Plan.
- The Florida Department of Environmental Protection holds several public meetings and workshops throughout the CWA 303(d) listing, TMDL development, and restoration stages.

- The Indiana Department of Environmental Management holds TMDL “kickoff” meetings before TMDL development begins so as to gather information and share information that may prompt engagement.
 - In Arizona, TMDL development typically involves at least two formal public meetings in addition to ongoing interaction with stakeholders regarding local knowledge and sample site access.
 - The Georgia Environmental Protection Division hosts one or more public meetings regarding draft CWA 303(d) lists.
 - Staff of the Massachusetts Department of Environmental Protection attend quarterly conservation district meetings to encourage district participation in CWA 319 and nonpoint source program activities.
 - The Nevada Division of Environmental Protection meets with stakeholders throughout the development of TMDLs. As part of its triennial review, the Division of Environmental Protection holds public meetings to solicit input from the public on desired water quality standards revisions.
 - The Surface Water Quality Bureau of the New Mexico Environment Department hosts public meetings every year to discuss the upcoming water quality surveys and to request stakeholder input. It also hosts public meetings to discuss TMDLs and UAA documents as well as the triennial review.
 - The Rhode Island Department of Environmental Management holds at least one public meeting during the development of each TMDL. It also holds public workshops to present the results of the Integrated Report assessment process and draft CWA 303(d) lists.
 - In Texas, TMDL, water quality standards, assessment, and nonpoint source programs all incorporate public meetings and workgroups that include stakeholders and communicate activities related to ongoing and future water quality management activities.
 - In Wyoming, every TMDL project includes public meetings. In addition, personal visits with local conservation districts or other stakeholders occur throughout the entire time a waterbody is targeted for monitoring, listed, and before TMDL development.
- **Field staff**
 - The Virginia Department of Environmental Quality and Department of Conservation and Recreation have staff in regional offices throughout the state specifically assigned to work with local stakeholders in restoring and protecting water quality through the TMDL and stormwater programs, as well as to provide environmental education and grant application and implementation support. These positions are TMDL Coordinators and Watershed Field Coordinators.
 - The Iowa Department of Natural Resources uses a network of five Basin Coordinators deployed across the major river basins within the state as staff tasked with the responsibility of seeking out and encouraging local awareness of water quality issues.
 - The Utah Division of Water Quality funds several local watershed coordinator positions throughout the state. Watershed coordinators help draft, manage, and implement watershed plans. They design, oversee, and implement restoration projects as well as work to secure the funding for those projects. Coordinators also manage outreach efforts by working with community leaders and watershed residents, providing watershed education and information, and attending public meetings.

- The North Dakota Department of Health has four regional watershed liaison staff who work with local stakeholder groups, soil conservation districts, and water resource boards to develop TMDLs, watershed assessments, and CWA 319 watershed implementation projects.

- **Listserves**
 - The Connecticut Department of Environmental Protection has set up listservs to disseminate information about water quality and associated activities.
 - Part of the Missouri Department of Natural Resources' effort to engage stakeholders involved the development of subscriber listservs for receiving news and other notices.
 - The Utah Division of Water Quality has developed a listserv to distribute news regarding water quality and the activities of the division.

- **Publications**
 - The TMDL Section of the Kentucky Division of Water publishes pre- and post-monitoring reports to explain the Clean Water Act and the TMDL process and to relay scientific information about water quality. The Initial Watershed Report (pre-monitoring) explains why the watershed is being monitored, provides the location of impaired streams in the watershed, and identifies where monitoring will occur. The Watershed Health Report (post-monitoring) highlights where improvement is needed within the watershed and the strengths of the watershed in hopes of protecting areas that are not yet impaired; it also assigns a letter grade to both signs of water quality and signs of biological health, averaging the two to determine the overall watershed grade.
 - In 2008, Minnesotans voted to increase their sales tax and passed the Clean Water, Land and Legacy Amendment, providing 25 years of dedicated funding for clean water, habitat, parks and trails, and the arts. This money has brought with it a need to show results and be transparent and accountable with the details of investment. In February of 2012, the first Clean Water Fund Performance Report was released. The report, to be updated every two years, uses outcome-based performance measures in order to monitor the progress and effectiveness of protection and restoration efforts made possible by the increase in funding. Performance measures fall into the categories of environmental and drinking water measures, partnership and leveraging measures, organizational performance measures, and financial measures. Social and stressor measures are currently in development. The report contains profiles of 18 different measures, including a measure narrative, a graphic summarizing the measure's data, and a measure score.
 - The New Mexico Environment Department distributes a quarterly newsletter entitled "Clearing the Waters," which contains updates from the Watershed Protection Section, CWA 319 Program, and other divisions.
 - The Water Quality Planning Unit of the Nebraska Department of Environmental Quality authored a step-by-step guidebook for community groups and stakeholders regarding the Watershed Management Planning process. The guide, entitled "Stepping Toward Better Watershed Management in Nebraska," is meant to advance the Community Based Approach to planning, in which local people identify the resource issues and geographic area affecting these issues as well as carry out a planning process to achieve the desired conditions. State agencies and others then provide the technical and financial resources to implement solutions.

- The Alaska Department of Environmental Conservation Division of Water publishes factsheets to inform the public about draft TMDLs within the state. The factsheets have clear information on the criteria of concern, the designated uses affected, and the major sources of the pollutants. In addition to explaining why the condition of the water is a concern, the fact sheets also explain what a TMDL is, why it is needed, and what it will accomplish. After answering these frequently asked questions, the fact sheet also provides information on how to get involved in the public review and comment process for the draft TMDL.
 - The Iowa Department of Natural Resources has a dedicated communications staff that coordinates all of its publications including quarterly newsletters and an annual success stories publication.
- **Interactive Mapping**
 - The Massachusetts Department of Environmental Protection has developed a web-based interactive GIS map that presents the Division of Watershed Management and Watershed Planning Program 2010 Integrated List of Waters with data layers representing the combined reporting elements for the 2010 cycle of both CWA Sections 305(b) and 303(d). This map was developed as a communication tool, attempting to convey all of the programs that are in play to address nutrients in the state.
 - The Nevada Division of Environmental Protection developed a web-based map for its 2008-10 Integrated Report. The map includes all waterbodies and sample locations evaluated in the 2008-10 report and the name, reach description, applicable Nevada Administrative Code, etc. for each waterbody evaluated as well as its beneficial use assessment. The map is searchable by waterbody, assessment category, assessed impairment, and sampling location.
 - The California Waterboards have created web-based, geographically spaced access to water quality assessment data. Through the map, users can view assessed waters in a Region, county, or waterbody. Users also can search by pollutant. Displays include the pollutant assessed, potential sources of pollutants, the year that the pollutant was listed, the estimated size of the assessed area, and the schedule for TMDL completion; this information also is linked to a detailed report regarding the evidence supporting the recommendation to list or not list. In addition, the map is linked to the Integrated Report, helping those reading the Integrated Report to understand the location of the water noted and geographical area covered.
 - Minnesota's Impaired Waters Viewer allows users to see on a digital map which waterbodies are on the state's 2010 CWA 303(d) list, which waters have approved TMDLs, or which waters have been delisted. Users can search for lakes, rivers, and cities and be shown other information like where discharges or citizen water quality monitoring activities are located.
 - The Arizona Department of Environmental Quality has developed a web-based interactive map that allows users to select a watershed to reveal all impaired waters therein along with a fact sheet about each waterbody, TMDL documents, updates on the status of the TMDL and any implementation plans or activities, and a staff contact.

- **Websites**

- The Missouri Department of Natural Resources has developed a set of program web pages presenting contact information; schedules and timelines; regularly updated notifications; and all relevant public documents such as TMDLs, CWA 303(d) lists, and permits.
- The Montana Department of Environmental Quality (DEQ) uses a diverse collection of web outlets, including websites, online databases, and wikis, to engage stakeholders and provide the public with direct access to water quality information. DEQ's main website provides an overview of its programs related to implementing the CWA and provides the ability to search its library records. The webpages are continuously updated to provide current information on DEQ's water quality monitoring and assessment methods, how to report and upload water quality monitoring data, the status of standards development, and the status of TMDL and CWA 319 projects. DEQ also houses a "Clean Water Act Information Center," an online database that links the user directly to water quality assessment records as well as current and past integrated reports. In addition, DEQ has two wiki sites open to the public, a TMDL site and a CWA 319 and nonpoint source program site. The sites are designed to provide current information on the projects of each program. Draft TMDL source assessment reports, water quality data, and draft TMDL documents are routinely posted for the review of watershed advisory groups. Presentations and handouts from TMDL stakeholder and public meetings also are posted. During the CWA 319 call for project proposals, all applications, proposal rankings, and final scores are posted.
- The Minnesota Pollution Control Agency website contains an online database for monitoring, land use, project status, and TMDL information. The database contains information about surface water and groundwater, air quality, contaminated sites, petroleum storage tanks, recycling and pollution prevention, spatial data, and hazardous and solid waste. The "What's in My Neighborhood?" function allows users to find environmental information about any Minnesota locale of interest, using a text-based or map-based search. This tool received a national award from the National Association of State Chief Information Officers in 2010 as the year's most impressive effort to make state government more transparent and accountable.
- In Virginia, several tools are being used in a revamped website to integrate mapping, watershed management, and allow stakeholders to understand regulatory and non-regulatory programs and to plan for water quality improvement efficiently.

APPENDIX F: Integration Examples

Current approaches to integration

- **Integrated agency structure**
 - The same section of the Kansas Department of Health and Environment that oversees the development of TMDLs also oversees water quality monitoring and standards. In addition, as part of the Bureau of Water, this section also is connected to the NDPES and 319/NPS programs, prompting daily interaction between the programs.
 - In Louisiana, water quality standards, assessment, TMDL, and permits (LPDES, CWA 404, and biosolids/sewage sludge, as well as CWA 401 water quality certification) staff are housed in the same division of the Department of Environmental Quality, fostering ease of communication and coordination. The division administrator is responsible for coordinating: all water permitting and related activities, review and development of water quality standards, assessment and reporting on state water quality, and modeling to support TMDL development.
 - The North Dakota Department of Health's Division of Water Quality houses the Surface Water Quality Management Program (SWQMP), the Groundwater Protection Program, and the Point Source Program (NDPDES). The SWQMP has nine full time staff and is responsible for surface water quality monitoring and assessment; CWA 319 NPS Management; and development of TMDLs, water quality standards, the nutrient management strategy, and the Integrated Report. This organizational structure has made integration effective both within the SWQMP and the Division of Water Quality.
 - Within the Hawaii State Department of Health, CWA 303(d) listing, TMDL, Water Quality Standards, CWA 319, and NPDES programs are housed under the Clean Water Branch. This infrastructure facilitates and necessitates synchronization among many of the CWA programs.
 - In 2010, Vermont's Watershed Management Division underwent reorganization in order to foster the implementation of integrated water resources management. This reorganization consisted of integrating its monitoring, assessment, and planning sections into a single program, as well as developing a Statewide Surface Water Strategy and initiating the Tactical Planning Process.
 - In Arizona, the TMDL, CWA 319, and surface water permitting programs all are under the direction of the Surface Water Section Manager in the Department of Environmental Quality, which has helped with integration among the programs. In addition, the agency section is developing a formal process to ensure project statuses are more completely understood.
 - In Connecticut, the TMDL Program and Water Quality Standards Program are administered by the same staff unit, and these two programs reside within a division which also includes the 319/watershed and monitoring/assessment units, all of which facilitates integration.
 - In Iowa, the CWA 319 Program and TMDL Program are housed under the same section, Watershed Improvement, in the Department of Natural Resources. Close coordination between the two programs has occurred as a result.
 - In Maryland, all CWA 303(d) programs as well as the CWA 319 NPS Program reside within the Science Services Administration of the Department of Environment. NPDES permitting is conducted within the Department of Environment but housed in a different administration.

- Rhode Island's National Shellfish Sanitation Program is managed by the same person managing the TMDL program, resulting in regular coordination between the two on a variety of program initiatives and an emphasis on shoreline surveys, pollution source assessments, and ambient monitoring.
 - In Utah, the TMDL and NPS programs are contained within the same work unit.
- **Dedicated agency position for integration**
 - Minnesota has improved coordination between its TMDL and NPDES programs, part of which is due to having dedicated positions in the wastewater and stormwater programs to lead TMDL integration efforts in permits.
 - In 2001, the Oregon Legislature passed Senate Bill 770, which directed state agencies to improve their relationships with the state's nine federally recognized tribes on issues pertaining to air, water, and land quality. In response to this law, the Oregon Department of Environmental Quality (DEQ) maintains a Tribal Liaison position in the Director's Office, among other measures. The Tribal Liaison meets with individual tribal nations annually and quarterly and participates in workgroups focused on resource management and protection of cultural resources. The liaison also facilitates leadership-level meetings between tribal and agency officials, provides tribal relations training to DEQ employees, and advises them on opportunities to strengthen relationships with tribal nations. The goal of this work is to understand and address tribal interests as they relate to DEQ's environmental work, as well as increase the collective ability of DEQ and the tribes to protect and enhance Oregon's environment.
- **CWA 319 elements incorporated into TMDLs**
 - The Utah Department of Environmental Quality is incorporating the 9 required elements of a CWA 319 watershed plan into TMDLs.
 - The Indiana Department of Environmental Management has developed and is testing a TMDL template that addresses the CWA 319 Program's 9 elements.
 - In Michigan, staff from the TMDL Program meets with staff from the Nonpoint Source Program and USEPA to identify candidate waterbodies for development of an implementation-ready TMDL that would meet the essential requirements of a CWA 319 watershed management plan.
- **Multi-program coordination groups**
 - The Indiana Conservation Partnership was formed to improve the quality of Indiana's waters, protect drinking water, and increase soil quality for food and fiber production through land and water stewardship assistance. Members include the Indiana Association of Soil and Water Conservation Districts and 92 SWCDs, the Indiana Department of Environmental Management and Department of Natural Resources, the Division of Soil Conservation in the Indiana State Department of Agriculture, the Purdue Cooperative Extension Service, the State Soil Conservation Board, the USDA Farm Service Agency, and the USDA Natural Resources Conservation Service.
 - In 2007, the California Environmental Protection Agency and California Resources Agency signed a MOU establishing the California Water Quality Monitoring Council to develop recommendations to improve the coordination and cost-effectiveness of water quality and

- ecosystem monitoring and assessment, the integration of monitoring data across departments and agencies, and public access to monitoring data. The California Water Quality Monitoring Council includes an executive level staff member from each of the two founding agencies; a staff member of the California Department of Public Health; and representatives from the regulated community, scientific community, water suppliers, agriculture, citizen monitoring groups, and the public.
- , which improves the coordination and cost-effectiveness of water quality and ecosystem monitoring and assessment between the California Environmental Protection Agency and the California Natural Resources Agency.
 - The Kansas Department of Health and Environment is a member of the Watershed Restoration and Protection Strategy Work Group that oversees watershed planning and implementation through the CWA 319 and USDA programs, leading TMDL Program staff to engage with other programs and agencies on a continual basis.
 - In Minnesota, senior managers of eight state agencies and the University of Minnesota's Water Resource Center work in an interagency coordination team that meets regularly to implement Minnesota's watershed approach. Also, eight Minnesota state agencies and the USDA's NRCS, along with all states in the Mississippi River basin, are coordinating strategies to reduce nitrogen and phosphorus sources within Minnesota to address the state's share impacting hypoxia problems in the Gulf of Mexico, Lake Winnipeg, and the Great Lakes.
 - The North Dakota Nonpoint Source Pollution Task Force is an advisory board that oversees the progress and development of the North Dakota Nonpoint Source Pollution Management Program. It meets regularly to review and comment on all locally sponsored NPS projects seeking CWA 319 funding. In addition, annual project reviews bring the task force together and often are a catalyst for furthering coordination between the task force's agencies and organizations and local NPS project sponsors. These meetings also provide a forum in which to discuss interagency issues and/or programs related to resource management across the state. The task force is comprised of 32 members representing state agencies (Departments of Agriculture, Game and Fish, Health, Parks and Recreation, and more), federal agencies (NRCS, USFS, USBR, USFWS, USEPA, and more), and public and private organizations (North Dakota Farm Bureau, North Dakota Water Resource Districts, North Dakota Wildlife Federation, and more).
 - Oregon's Conservation Effectiveness Monitoring Partnership was developed in 2010 between the Oregon Watershed Enhancement Board, Oregon Department of Environmental Quality, and USDA NRCS. The three partner agencies had begun meeting in order to find a way to improve collaboration on their shared grant program goals of improving water quality, watershed functions, and processes. Recognizing the potential benefits to not only their own agencies but also the public of more readily sharing information relevant to their shared program elements, they signed a memorandum of understanding to formalize their collaboration. The agreement fosters the sharing of information between these three agencies, as well as the Oregon Department of Agriculture, which joined the agreement more recently. The partnership works to build a more thorough understanding of the collective investment in watershed improvement actions through their shared collective grant programs, improve understanding of how local organizations are taking advantage of these grant programs, evaluate the impacts of grant investments on water quality while also locating and describing the gaps in treatment of watersheds, and designing tools and methods to report accomplishments to the public.
 - In Oklahoma, a TMDL working group consisting of state agency staff and occasionally federal agency staff meets quarterly to review TMDL progress, priorities, and planning.

- The New England Interstate Water Pollution Control Commission forms workgroups of state and federal agency personnel with expertise on a specific topic to discuss problems, share needs, and develop recommendations. These workgroups have addressed issues such as water quality standards, nutrient criteria, lakes biocriteria, mercury, pharmaceuticals and personal care products, residuals, turf fertilizer, nonpoint source, TMDLs, the Long Island Sound TMDL, NPDES, stormwater, on-site wastewater, tanks, groundwater and source water protection, drinking water administrators, operator training, wetlands, and climate change.
- **Multi-program meetings**
 - In Alabama, staff of the NPDES permitting, water quality standards, TMDL, Integrated Reporting, water quality monitoring, and CWA 319 programs routinely meet to coordinate the implementation of their respective programs so as to effectively and efficiently manage the various programs administered under the Clean Water Act.
 - Staff of the Arizona Department of Environmental Quality meets annually with U.S. Forest Service watershed staff, hydrologists, and on-scene coordinators to review ongoing and upcoming projects.
 - Once a year the Utah Division of Water Quality hosts an interagency coordination meeting with the staff of other state and federal agencies to share upcoming water quality related concerns and coordination issues.
 - Staff of the Bureau of Water Quality Planning in the Nevada Division of Environmental Protection periodically meets with federal agencies such as BLM, USFS, NRCS, and USFWS as well as the Nevada Department of Wildlife to identify priority waters for water quality standards and TMDL development and ideally foster the implementation of restoration efforts.
 - Staff of the Division of Water Quality in the North Dakota Department of Health meets quarterly with the state conservationist to improve how each does business at the local level.
- **Coordinated plans**
 - Iowa's Nonpoint Source Management Plan was updated through a collaboration of the Iowa Department of Natural Resources, the Division of Soil Conservation of the Iowa Department of Agriculture and Land Stewardship, the USDA NRCS, Iowa State University's Extension and Leopold Center, and Conservation Districts of Iowa. All five of the core partners operate a diverse array of programming that deals with runoff pollution, and their collective involvement made possible the development of an inventory of all programming efforts and funding sources for runoff pollution related issues. The Nonpoint Source Management Plan now serves as a starting point for collaborating on implementation projects.
 - Vermont's Tactical Basin Planning Framework is a way of coordinating existing programs and building partnerships to improve the management of the state's surface water resources. The framework lays out a process for developing individual basin-specific plans. Before basin planning begins, staffers from programs within and outside the Agency of Natural Resources come together for a series of meetings. Examples of programs represented include Watershed Management, Groundwater and Drinking Water Protection, Waste Management, Fisheries, and Watershed Forestry as well as those from the Agency of Agriculture and Agency of Transportation. They review water quality monitoring data and

- identify monitoring needs, prioritize protection and restoration projects, and identify current sources and amounts of funding. Through this process, the participants prioritize sub-basins within a major river basin for further action.
- In Texas, the Watershed Action Planning process includes water quality programs at the Commission on Environmental Quality and State Soil and Water Conservation Board, such as Water Quality Monitoring and Assessment, Water Quality Standards, TMDL, and Nonpoint Source Pollution. Other programmatic areas, such as the Regional Offices and coastal programs may also take part in the discussions and decisions.
 - In Illinois, Integrated Watershed Planning involves the NPDES, NPS, Stormwater, and Public Water Supply programs.
- **Cooperative agreements**
 - The Montana DEQ currently has separate MOUs with the United States Bureau of Land Management, the United States Forest Service, and the USDA's Natural Resources Conservation Service. Each MOU spells out processes and opportunities for inter-agency communication and collaboration to address water quality issues in Montana. DEQ hopes to develop similar MOUs with other government agencies in the future.
 - Signed in 2012, the Colorado River Cooperative Agreement brings together multiple state agencies with over 40 water providers, local governments, and the ski industry to develop cooperative, long-term efforts to improve the health of the river. The agreement also provides for resolution of long-standing conflicts and water disputes and additional water for recreation and other uses. It also dedicates funds to pay for watershed, water treatment and aquatic habitat improvements in the Colorado River Basin.
 - Colorado's Water Quality Control Division uses memoranda of understanding (MOUs) to formalize coordination with other agencies. The Stream and Wetland Ecological Enhancement Program (SWEEP) MOU was signed in 2011 by the state and federal agencies and local stakeholder groups. These include the Colorado Department of Transportation, the Federal Highway Administration, the US Fish and Wildlife Service, the USDA Forest Service, Rocky Mountain Region, Arapaho and Roosevelt National Forests and White River National Forest, the USDOJ Bureau of Land Management, Colorado Division of Wildlife, Clear Creek County, Clear Creek Watershed Foundation, Upper Clear Creek Watershed Association and Colorado Trout Unlimited. The SWEEP committee was formed in response to proposed improvements to the I-70 Mountain Corridor, which passes through several watersheds supporting aquatic resources. While the I-70 Mountain Corridor benefits Colorado citizens and is good for economic interests, it also impacts the water quality and viability of watershed ecology in the watersheds through which it passes. The MOU was signed in an effort to improve stream and wetland conditions in the Corridor. The SWEEP committee will bring together watershed and water quality experts, community representatives, and other parties to identify and recommend appropriate mitigation strategies for the anticipated environmental impacts of the redevelopment.
 - **Integrated databases**
 - The California Environmental Data Exchange Network (CEDEN) aggregates water quality, aquatic habitat, and wildlife health data from any agency, group, or individual collecting such water quality information. CEDEN makes this data available to all agencies and the public through the website.

- In Texas, the TMDL and NPDES programs maintain an up-to-date database of TMDL requirements for permitting purposes.