DEQ
Montana Department
of Environmental Quality

Montana's Water Quality Monitoring and Assessment Strategic Plan

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1.0 INTRODUCTION, BACKGROUND, AND PURPOSE OF PLAN

Clean water is essential to human health and Montana's economy. The Montana Department of Environmental Quality (DEQ) Water Quality Division supports and implements measures to safeguard Montana water resources, including approximately 58,200 miles of rivers and streams and 730,000 acres of lakes. The Water Quality Division monitors water quality and tracks change over time, assesses water quality and informs people about the health of state waters, identifies impaired waters and their sources of pollution, and develops plans to guide water quality improvement activities. DEQ also assists local communities with finding and implementing solutions to restore and maintain clean water, and works in partnership with other federal, state, and local entities to ensure that clean water remains part of Montana's natural heritage.

DEQ's Water Quality Monitoring and Assessment Strategic Plan supports protection and restoration of clean water across Montana. The Plan outlines the long-term water quality monitoring, assessment, and related reporting objectives that the Water Quality Division's Monitoring and Assessment program will support over the next twenty years and details a series of strategies to achieve each objective.

This strategic plan:

- Addresses current and anticipates future monitoring and data needs
- Promotes integration and communication among DEQ programs and with external partners
- Aligns with state and federal requirements
- Enables DEQ to be responsive to variable water quality issues and concerns
- Identifies informative products to convey water quality data and decisions
- Informs prioritization and allocation of monitoring and assessment resources in accordance with objectives and feedback

DEQ will implement mechanisms to obtain and incorporate feedback into this strategic plan and will use performance measures to periodically evaluate the plan's success.

2.0 VISION AND MISSION OF MONITORING AND ASSESSMENT

DEQ's Monitoring and Assessment program's **vision** is that *people of Montana have, understand, and use credible water quality information toward effective water quality protection and restoration.*

The **mission** of DEQ's Monitoring and Assessment program is to:

- *Collect and report credible surface water quality data and information,*
- *Evaluate surface water quality conditions over time,*
- *Convey data and decisions to resource managers and the public in a meaningful and informative way,*
- *Promote water quality protection and improvement, and*
- *Provide technical expertise and material resources to support DEQ and partners' monitoring and data needs.*

3.0 Monitoring and Assessment Objectives and Strategies

DEQ's Monitoring and Assessment program has four primary objectives achieved using several strategies:

Objective 1: Inform, engage, and support people working to protect and improve water quality
- Strategy: Support monitoring partnerships, including volunteer monitoring
- Strategy: Report to stakeholders
- Strategy: Improve data sharing

Objective 2: Describe current water quality conditions
- Strategy: Evaluate water quality and beneficial use support
- Strategy: Make spatial comparisons of water quality
- Strategy: Investigate water quality problems
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Objective 3: Track water quality change over time
- Strategy: Document water quality improvements in focus watersheds
- Strategy: Document water quality improvements where partners implement projects
- Strategy: Monitor long-term trends

Objective 4: Support DEQ programs' monitoring and data needs
- Strategy: Supply monitoring resources to help DEQ programs fill data needs

Objective 1: Inform, engage, and support people working to protect and improve water quality

People are better able to engage in activities that protect and improve water quality when they are educated about water quality and have access to high-quality, scientifically-rigorous, and up-to-date data and information.

Strategy: Support monitoring partnerships and volunteer monitoring

Many entities collect water quality data in Montana, including federal and state agencies, local governments, community groups, universities, and others. Monitoring partnerships among DEQ programs and with external entities will increase the quantity of high quality data available for making informed decisions. Also, Montana has a network of volunteer water quality monitoring programs administered by watershed groups, conservation districts, non-governmental organizations, schools, and others. Volunteer monitoring gives people a hands-on opportunity to learn fundamental concepts of water quality and become involved in protecting water resources in their community.

To support these efforts, DEQ's Monitoring and Assessment program will:

- Share and leverage monitoring resources with other agencies and programs through collaborative monitoring and funding agreements. These partnerships will most readily occur when partners have monitoring objectives that overlap with DEQ program objectives and in focus watersheds. Partnerships should strive to improve monitoring efficiency.
- Support and promote volunteer monitoring activities that align with DEQ program objectives by:

  - Providing financial or material support (e.g., Volunteer Monitoring Lab Analysis Support Program and lending equipment),
  - Providing technical guidance and document review,
  - Creating volunteer monitoring and citizen science opportunities,
  - Highlighting volunteer monitoring successes, and
  - Partnering with other entities in the state that also support volunteer monitoring such as the Montana State University Extension Water Quality Program and the Montana Watershed Coordination Council.
- Share technical guidance and expertise with monitoring partners including monitoring protocols, monitoring designs, sampling and analysis plans, training, data management systems, and quality assurance systems.
- Maintain and lend water quality monitoring equipment and supplies to partners.

Strategy: Report to stakeholders

DEQ's Monitoring and Assessment program will transparently share data, analyses, methods, findings, and decisions with other DEQ programs, other agencies, stakeholders, and the public, and will strive to develop work products that are appropriately suited for various audiences:

- Use web-based reporting tools that are user-friendly such as DEQ's website, DEQ's Clean Water Act Information Center, and ArcGIS Online dashboards or story maps. Focus on reporting findings about water quality conditions and trends.
- Use succinct and plain language when reporting to general audiences (e.g., pamphlets, infographics, story-telling, social media).
- Report technical information for water resource professionals when necessary (e.g., technical reports and appendices).
- Provide presentations to and have discussions to solicit feedback with various stakeholders
- See "Section 6: Public Information, Education & Outreach" and "Section 7: Website & Public Outreach."

Strategy: Improve data sharing

Montana is a large and environmentally diverse state with limited monitoring resources. Data sharing is increasingly necessary to meet data requirements and make well-informed and accurate decisions. DEQ's Monitoring and Assessment program will:

- Adhere to DEQ data management systems and make data publicly-available (e.g., MT-eWQX Enterprise, Water Quality Portal).
- Implement quality assurance and quality control measures to ensure data users can adequately evaluate suitability of data.
- Solicit and use secondary data that meets quality requirements (e.g., biennial Call for Data and MT-eWQX submittal process).
- Promote data management and data quality systems with monitoring partners to ensure comparability of data.

OBJECTIVE 2: DESCRIBE CURRENT WATER QUALITY CONDITIONS

DEQ's Monitoring and Assessment program collects and analyzes data to describe and evaluate water quality conditions in rivers, streams and lakes in Montana. This helps people understand why clean water is important, how water quality changes from place to place, and how water quality is influenced by peoples' use of lands and water resources. Strategies implemented to achieve this objective should be coordinated with stakeholders to align monitoring and assessment activities with local priorities. This objective aims to helps people prioritize where and what type of water quality protection and restoration activities are needed most.

Strategy: Assess water quality and beneficial use support

Water quality standards are established to ensure that waters can support their beneficial uses such as aquatic life and fisheries, agriculture, drinking water, and recreation. *Impaired waters* are those that do not meet water quality standards and do not fully support beneficial uses. DEQ's Monitoring and Assessment program assesses the quality of Montana's water and produces a list of impaired waters per Montana's Water Quality Act. This report meets state requirements of the Montana Water Quality Act (75-5-702, MCA) and federal requirements of section 303(d) of the federal Clean Water Act (33 U.S.C §1251 et seq.). Total maximum daily loads (TMDLs) must be developed for each waterbody-pollutant impairment identified on Montana's list of impaired waters.

DEQ's Monitoring and Assessment program will:

- Continue the progression of DEQ's water quality planning process (i.e., monitoring, assessment, TMDL development, water quality restoration and protection) in coordination with the Watershed Management (TMDL) and Nonpoint Source programs. Prioritize watershed scale assessment projects where:
  - Stakeholders are leading local water quality planning and are implementing activities and projects to reduce pollution,
  - Assessments fill information gaps (e.g., assessments have not been completed, previous assessments missed significant issues or waters, or confidence in previous assessment decisions has decreased because data and decisions are outdated, or sources have changed), and
  - Assessment findings may stimulate stakeholder involvement and increase the likelihood that projects to improve water quality are implemented.
- Consider links between sources and pollutants to prioritize what and where to assess and to inform assessment decisions (e.g., use watershed risk assessment when developing assessment scope, identify probable sources for each cause of impairment).
- Perform water quality assessment to determine whether waters are attaining water quality standards and supporting their designated beneficial uses; identified impaired and threatened waters.
- Reassess waters in coordination with the Nonpoint Source program and stakeholders following implementation of TMDL recommendations and watershed restoration plans; consider recovery time needed to achieve water quality standards.
- Revise existing and develop new assessment methods over time to guide impairment listing and beneficial use assessment decision-making; incorporate input from other DEQ programs and stakeholders during the process.
- Assess large rivers and lakes as applicable standards, monitoring protocols, and assessment methods are developed.

Strategy: Make spatial comparisons of water quality

Analyzing and displaying data to compare water quality from place to place can help people understand water quality potential and prioritize where to focus water quality protection and restoration activities in their watershed. Comparisons can highlight both high quality waters and those with pollution problems and can help identify waters that require further investigation. Although many water quality investigations center around particular watersheds or waterbodies, it is also important to monitor and describe water quality across the state.

To support these efforts, DEQ's Monitoring and Assessment program may

- Monitor and report water quality at multiple spatial scales, including waterbody, watershed, regional and statewide; prioritize areas where beneficial use assessment, TMDL development, or water quality improvements are being prioritized.
- Conduct synoptic surveys which give a broad view of water quality across space within a particular time period; monitoring designs should strategically represent different hydrologic and seasonal conditions to enable comparisons and detection of spatial patterns.
- Conduct or support probabilistic monitoring at randomly selected locations to answer basic questions such as: What are the primary water quality problems and pollutants in Montana? How widespread are these problems? How does Montana's water quality compare to the rest of the nation? (e.g., EPA's National Aquatic Resource Surveys). Statewide monitoring networks may:
    - Help ensure that up-to-date information is collected periodically across the state, including in watersheds that are not currently considered focus watersheds,
    - Inform decisions about what and where to monitor and assess in the future (e.g., major tributaries or source areas),
    - Target specific pollutants of interest (e.g., nutrients in large rivers, or pathogens and harmful algal blooms in lakes with high intensity recreational use).
- Produce state of the watershed or waterbody reports to summarize statistics and spatial findings; use compelling maps and images and web-based reporting platforms where possible.

Strategy: Investigate water quality problems

DEQ's Monitoring and Assessment program investigates threats or suspected water quality problems to try to determine why an observed change is occurring. These investigations are often necessary to determine what can be done to halt or reverse negative impacts of the change:

- Investigate in response to stakeholder concerns (e.g., algal blooms, harmful algal blooms); coordinate with monitoring partners as appropriate.
- Monitor emerging pollutants (e.g., pesticides, herbicides, plasticizers, pharmaceuticals, personal care products).
- Participate in agency or inter-agency emergency response teams for spills, leaks, aquatic invasive species, etc.

Strategy: Establish baseline and reference conditions to enable future comparisons

DEQ's Monitoring and Assessment program collects baseline data and reference data to enable future comparisons. Baseline data represents current conditions and can provide a starting point for future comparisons. Reference data is collected at locations that experience minimal human influence or where reasonable land, soil, and water conservation practices are in place and can be used to develop or interpret water quality standards, to develop targets used during beneficial use assessments and TMDL development, to distinguish human influences from natural conditions, to approximate waterbody potential, and to set restoration goals in similar watersheds. To support these efforts, DEQ's Monitoring and Assessment program will:

- Prioritize baseline monitoring in areas where water quality threats or improvements are anticipated; consider emerging pollutants and new or increasing sources of pollution.
- Collect baseline data prior to commencement of improvement activities, threats, or new or increasing sources of pollution (e.g., natural resource extraction, development, new point sources, cross-boundary pollutants, climate change).
- Engage local monitoring partners when possible.
- Support DEQ's reference stream project as needed; this project has been administered by the Water Quality Division since the early 1990s and collects data across the state at sites that are in natural (Tier I) or minimally impacted (Tier II) condition.
- Collect or compile reference data during assessment projects, as needed:
    - from internal reference sites that represent least impacted conditions on the waterbody that is the subject of investigation,
    - from regional reference sites that are near and comparable to the waterbody being assessed,
    - from agency partners such as USFS's Pacfish/Infish Biological Opinion (PIBO) program and BLM's Proper Functioning Condition (PFC) assessments, and
    - from literature.
- Reporting on reference data is one mechanism for describing good water quality conditions in the state.

OBJECTIVE 3: TRACK WATER QUALITY CHANGE OVER TIME

DEQ protects and improves water quality by managing nonpoint source pollution through voluntary activities (e.g., Nonpoint Source program and 319 funds), point sources through regulatory activities (e.g., permitting) and State Revolving Fund loans for investments in infrastructure improvements, and legacy pollution sources via cleanup activities (e.g., remediation). DEQ's Monitoring and Assessment program helps demonstrate that DEQ programs' and partners' actions are successfully resulting in measurable water quality improvements. In specific situations, DEQ's Monitoring and Assessment program also strategically evaluates long-term water quality trends (improving or declining) which generally involve robust, continual datasets and statistical analyses.

Where multiple DEQ programs' priorities align in a common focus watershed, coordination may occur to collectively address nonpoint, point, and legacy sources of pollution to efficiently leverage resources and allow cumulative improvements to be observed within a shorter timeframe.

Strategy: Document water quality improvements in focus watersheds

A key element of DEQ's Nonpoint Source program strategy involves identifying focus watersheds where it is DEQ's goal to apply a majority of Nonpoint Source program staff and funding resources over a given period to influence significant and measurable progress toward reducing nonpoint source pollution. According to DEQ's Nonpoint Source program strategic plan, DEQ will select a focus watershed based on the following attributes:

- One or more DEQ-accepted Watershed Restoration Pans are in place.
- Resources and momentum exist through active watershed groups, agencies, or other entities promoting water quality and/or habitat protection.
- Local citizens, stakeholders, and visitors are interested in, support, and value natural resources provided by water quality.
- The extent to which DEQ resources can provide increased momentum for water quality improvement actions on the ground.
- DEQ's ability to track changes in water quality and/or key water quality indicators through time.
- Supports other agency or other internal DEQ program priorities.
- The extent of nonpoint source pollution issues and related impairment conditions that can be addressed via traditional BMPs.
- Opportunities to reduce municipal wastewater or other point source water treatment costs by reducing upstream nonpoint sources of pollution.

DEQ's Monitoring and Assessment program will coordinate with the Watershed Management and Nonpoint Source programs to track water quality improvements in focus watersheds:

- Collect baseline data for use in making comparisons to track change over time.
- Develop monitoring designs aimed at linking water quality change to actions or projects:
  - Monitor conditions pre- and post-action,
  - Bracket tributaries or source areas (i.e., upstream and downstream) where implementation activities are being focused,
  - Monitor at sentinel sites or fixed stations to track trends at priority sites,
  - Monitor at or around permitted facilities that have made upgrades.
- Support local watershed capacity and monitoring partnerships, including volunteer monitoring, before and during implementation.
- Reassess waterbodies to determine whether water quality standards are met and beneficial uses are supported, when warranted (e.g., pending implementation and recovery time).
- Highlight achievements and success stories.

Strategy: Document water quality improvements where partners have implemented substantial improvement activities

DEQ programs and partners are implementing water quality improvement activities across the state. Where enough activities have been implemented to suggest that the cumulative benefits of these activities will result in detectable improvement in water quality conditions, DEQ's Monitoring and Assessment program will monitor to track these improvements.

- Collect baseline data and make comparisons to track change over time.

- Support Nonpoint Source program success story reporting where, for example, implementation of water quality improvement activities led to successful removal of an impairment from the list of impaired waters and/or full support of beneficial uses.
- Support National Water Quality Initiative (NWQI) projects via baseline, source assessment, and/or post-restoration monitoring and reporting.
- When warranted (e.g., pending implementation and recovery time), reassess waterbodies to determine whether water quality standards are met and beneficial uses are supported:
  - Recommendations from Nonpoint Source program TMDL Implementation Evaluations (TIEs)
  - Requests from stakeholders/partners.
- Encourage and support monitoring partnerships.

Strategy: Monitor long-term trends

Water quality trend analysis is reliant upon long-term historical datasets and statistical analyses. DEQ's Monitoring and Assessment program conducts or supports trend analysis, particularly for large rivers and lakes. Water quality trend analysis also typically accounts for variables such as climate, hydrology, and source changes.

- Conduct or support trend monitoring and trend analyses.

OBJECTIVE 4: SUPPORT DEQ PROGRAMS' MONITORING AND DATA NEEDS

Strategy: Supply monitoring resources to help DEQ programs fill data needs

DEQ's Monitoring and Assessment program supports other programs within DEQ, including Watershed Management (TMDL), Nonpoint Source, Remediation, Permitting, Emergency Response and others, by helping them fill data needs or by providing monitoring resources:

- Provide monitoring resources such as field staff, technical guidance, training, monitoring protocols, lab analysis funds, equipment and supplies,
- Develop joint sampling and analysis plans when program priorities overlap.

4.0 PRIORITIES

Tracking water quality change over time is a key priority and is essential for evaluating the successes of DEQ's water programs. Water quality monitoring and assessment activities that aim to track change will be centered especially within watersheds where DEQ programs have supported or implemented activities to improve water quality. For example, DEQ's Monitoring and Assessment program will coordinate closely with the DEQ Watershed Management (TMDL) program and the Nonpoint Source program and partners in areas where a majority of nonpoint source resources are being applied such as focus watersheds and areas where DEQ-accepted watershed restoration plans are being implemented.

Another priority of DEQ's Monitoring and Assessment program is to meet statutory obligations imposed by state or federal laws and regulations. For example, Montana's Water Quality Act (75-5-702, MCA) and Section 303(d) of the federal Clean Water Act (33 U.S.C §1251 et seq.) requires the state to monitor and assess the quality of state waters and to identify surface waterbodies that are threatened or impaired. DEQ must also monitor water quality over time to determine whether compliance with water quality standards has been attained for particular waterbodies and impairments and to analyze the

effectiveness of pollution control measures (e.g., waste load allocations in water discharge permits, voluntary conservation practices) (75-5-703, MCA).

DEQ's Water Quality Monitoring and Assessment program is also committed to supporting monitoring partnerships and volunteer monitoring efforts that help develop a robust and effective water quality monitoring community in Montana.

5.0 MEASURING SUCCESS

Metrics that DEQ's Monitoring and Assessment program uses to measure success may include:

WATER QUALITY IMPROVEMENTS

- Measurable water quality improvements linked to DEQ or partner actions
- Trend analyses that indicate improving trends

MONITORING

- Number of data points or result values
- Number of monitoring stations visited
- Number of private landowners who gave permission to sample on private lands
- Approval of sampling and analysis plans
- Approval of standard operating procedures
- Number of active volunteer monitoring programs
- Volunteer monitoring participation, including use of public reporting tools
- Number of efficient, collaborative monitoring partnerships among DEQ programs and with external partners
- Dollars distributed to support monitoring partnerships, including volunteer monitoring
- Number of trainings offered or training participants

ASSESSMENT

- Approval of assessment methods
- Number or percent of assessed stream miles or lake acres
- Number or percent of watersheds where water quality planning process is complete
- Instances of local stakeholders applying data and assessment findings during watershed restoration planning
- Public comments on Water Quality Integrated Report

PUBLIC OUTREACH & EDUCATION

- Number of public meetings help and attendance at public meetings
- Feedback on stakeholder reports, pamphlets, technical reports, etc.
- Positive public relations and perception
- Website and social media analytics

6.0 PROGRAM INTEGRATION AND COMMUNICATION

DEQ's Monitoring and Assessment program may use the following mechanisms for program integration and communication:

CALL FOR PROJECTS FROM EXTERNAL PARTNERS

Requests for projects are often received from external partners and interested parties. A strategy is needed to receive, prioritize and respond to requests to balance resource allocations and constraints:

- Release an annual or biennial "call for projects" from external partners in coordination with DEQ's Nonpoint Source and Watershed Management programs; prioritize and link projects to objectives in strategic plans, such as:
  - Known or suspected water quality problems (Monitoring and Assessment lead),
  - Water quality improvements resulting from implementation (Nonpoint Source lead),
  - Identifying existing or future threats (Monitoring and Assessment and Nonpoint Source/Watershed Management lead).
- Convey reasonable expectations for response to project requests; develop transparent process for prioritization; convey what information is needed to prioritize or respond to requests.

CALL FOR PROJECTS FROM INTERNAL PARTNERS

Provide monitoring support to various DEQ programs, including:

- Watershed Management and Nonpoint Source programs: 1) requests to track nonpoint source improvements, 2) requests for reassessment following TMDL Implementation Evaluations (TIEs); 3) requests for reassessment for potential success stories, 4) requests for support during TMDL development (e.g., in response to new water quality discharge permit applications), 5) water quality planning process initiation in watersheds without recent assessments.
- Remediation, Superfund, Abandoned Mine Lands: requests to reassess or coordinate to track improvements in response to cleanup activities.
- Water quality permitting (MPDES, Coal, Hard Rock): 1) requests for baseline data prior to new or changing discharge permits, 2) requests to track water quality following permit issuance (permittee generally responsible for this; DEQ's Monitoring and Assessment program supports only if warranted), 3) requests to track improvements when treatment upgrades are planned.
- Standards and Modelling.

WATERSHED/WATERBODY PLANNING PROCESS

Coordinate with DEQ's Watershed Management program to strategize project selection and timing of beneficial use assessment activities in watersheds where TMDLs may need to be developed; coordinate selection with stakeholders including landowners, watershed advisory groups, monitoring partners, etc.

WATER QUALITY STANDARDS

Coordinate with DEQ's Standards program to provide feedback about how standards are working while they are implemented during beneficial use assessment; provide recommendations for prioritizing standards development or review; provide monitoring support during standards development projects.

DATA & INFORMATION SHARING

Request and compile existing data during projects and evaluate data according to data quality requirements specified (e.g., existing and readily available data in assessments, biennial call for data); enhance capacity of volunteer monitoring programs to collect and manage high quality data; adhere to Water Quality Division data quality and data management processes to ensure data is accessible.

PUBLIC INFORMATION, EDUCATION & OUTREACH

Share information with the public; promote education and outreach opportunities during projects; communicate clearly and use plain language suitable to a variety of audiences; coordinate with DEQ's public information officers and web development team; employ media and social media to disperse information and promote involvement.

MONITORING PARTNERSHIPS AND VOLUNTEER MONITORING

Enter monitoring partnerships to support common objectives and efficiently leverage monitoring resources; use contracts or other funding strategies, memorandums of agreement, equipment sharing, etc.; devote resources to support volunteer monitoring statewide, especially activities that align with DEQ objectives; coordinate with other DEQ and external programs to recommend and implement volunteer monitoring opportunities and support.

SAFETY AND EMERGENCY RESPONSE

Participate in DEQ's emergency response team; refine a safety program and policies pertaining to field activities.

EQUIPMENT, SUPPLIES AND INTERNAL MONITORING TRAINING

Purchase, inventory and maintain a fleet of monitoring equipment and supplies; support other programs' monitoring and storage needs when possible.

7.0 PROGRAM PRODUCTS

Products that DEQ's Monitoring and Assessment program will produce while achieving the objectives outlined in this strategic plan may include:

DATA AND QUALITY ASSURANCE

Produce data and information, including laboratory results, written observations, photographs, and calculations; coordinate with database managers and data analysts, DEQ's Quality Assurance officer, and laboratories to implement quality assurance and quality control measures, and to manage and store data in DEQ's MT-eWQX database and the Water Quality Portal; produce quality assurance documentation such as program plans, sampling and analysis plans (SAPs), standard operating procedures (SOPs), and desk manuals.

PROJECT REPORTS AND SUMMARIES

Produce reports and pamphlets that summarize objectives, data and results for monitoring and assessment activities, ranging from publicly-consumable pamphlets or project briefings with succinct narratives, figures, and maps, to technical reports more suitable for resource professionals:

- Monitoring, investigation and trend analysis summary reports
- Water quality improvement reports in coordination with Nonpoint Source program (e.g., success stories, National Water Quality Initiative, etc.).
- State of a waterbody/watershed/state water quality reports

- Grant reports
- Project overviews on DEQ website

WEBSITE & PUBLIC OUTREACH

Share information on DEQ's website that is clear, informative, and easy to navigate; tell the story about what we do, why we do it, and what we've found; spotlight issues and projects of public interest; share information with the public and stakeholders using a variety of means including public meetings, informational presentations to stakeholder advisory groups or professional conferences, media and social media, etc.; coordinate outreach with partner programs.

ARCGIS ONLINE DASHBOARD

Contribute metrics and data to the Water Quality Division ArcGIS Online Dashboard.

VOLUNTEER MONITORING SUPPORT PROGRAM

Produce guidance documents, funding programs, training opportunities and equipment for loan tailored to meet volunteer monitoring needs over time.

ASSESSMENT RECORDS

Update assessment records for all waterbody assessment units assessed per reporting cycle, adding data summaries, citations, assessment findings, overall condition summary, probable causes and sources of impairment, and beneficial use support status.

WATER QUALITY INTEGRATED REPORT

Contribute to Water Quality Integrated Reports, including beneficial use assessments, water quality impairments, and water quality status and trend summaries.

COLLABORATIVE REPORTS

Collaborate with DEQ water programs and project partners to report on water quality monitoring and assessment, such as nonpoint source five-year plan and annual reports, National Water Quality Initiative reporting, success stories, and project reports.

8.0 PROGRAM LIMITATIONS AND ISSUES

Limitations and issues that DEQ's Monitoring and Assessment program encounters may include:

STAFF AND RESOURCE PLANNING

- Project management time and skill
- Contract management
- Knowledgeable staff and expertise for complex projects
- Funding support for seasonal staffing and new staff training
- Amount of funding and flexible funding sources (e.g., grants with specific uses and deadlines)
- Strategic planning and prioritization
- Emergency and contingency planning for budgets and resource allocation

DATA ANALYSIS CHALLENGES

- Natural variability in large, environmentally diverse state

- Impacts from drought, floods, climate change, other
- Long-term, robust datasets needed for statistical rigor
- Methods needed for analysis and interpretation of narrative standards for large rivers and lakes
- Wide variety of issues, concerns, and priorities
- Need for assessment methods to be developed or revised

MONITORING

- Need for monitoring protocols (standard operating procedures) to be developed or revised
- Logistically challenging in large and environmentally diverse state to collect sufficiently descriptive data and to balance travel costs and efficiency

STAKEHOLDER INTEREST & INVOLVEMENT

- Limited in some watersheds

COMMUNICATION

- Multiple audiences with varying degrees of comprehension of technical concepts
- Strive for transparency
- Challenging to translate complex and scientific information using plain language and visual tools

MONITORING PARTNERSHIPS

- Quality assurance documentation and data management and analysis requirements can be onerous for volunteer monitoring programs
- Entities that administer volunteer monitoring programs may have limited technical expertise
- Monitoring programs often have limited coordination and leadership capacity
- Different programs often use different methods and have different data quality requirements; collaboration is needed to ensure adequate data quality and comparability

9.0 PLAN REVIEW AND MODIFICATION

This strategic plan is intended to outline the objectives and strategies that DEQ's Water Quality Monitoring and Assessment program will use while pursuing the program's vision over the next twenty years. Periodic review and modifications may be necessary as state priorities shift. Efforts will be made to notify and coordinate with partners and stakeholders if substantive changes are made.