RHODE ISLAND'S TMDL VISION 2.0 FRAMEWORK

Rhode Island Department of Environmental Management
Office of Water Resources
July 2024

Rhode Island's Water Quality Management Framework

Rhode Island's water quality management framework is a systems management approach purposefully designed to address water resource protection and restoration in a more holistic manner[1]. It acknowledges the continuing implementation of established governmental programs to regulate various water pollution sources, protect aquatic habitat, and facilitate water quality improvements. Using sound science as its foundation, the water quality management framework consists of a five step process -- Monitor, Assess, Plan, Protect/Restore, and Evaluate:

1) Monitor the quality and condition of water resources.

2) Based on an assessment of available data, characterize the condition of water resources and identify stressors or causes of degradation;

3) Develop a plan or strategies to restore and protect water resource conditions to achieve specified goals;

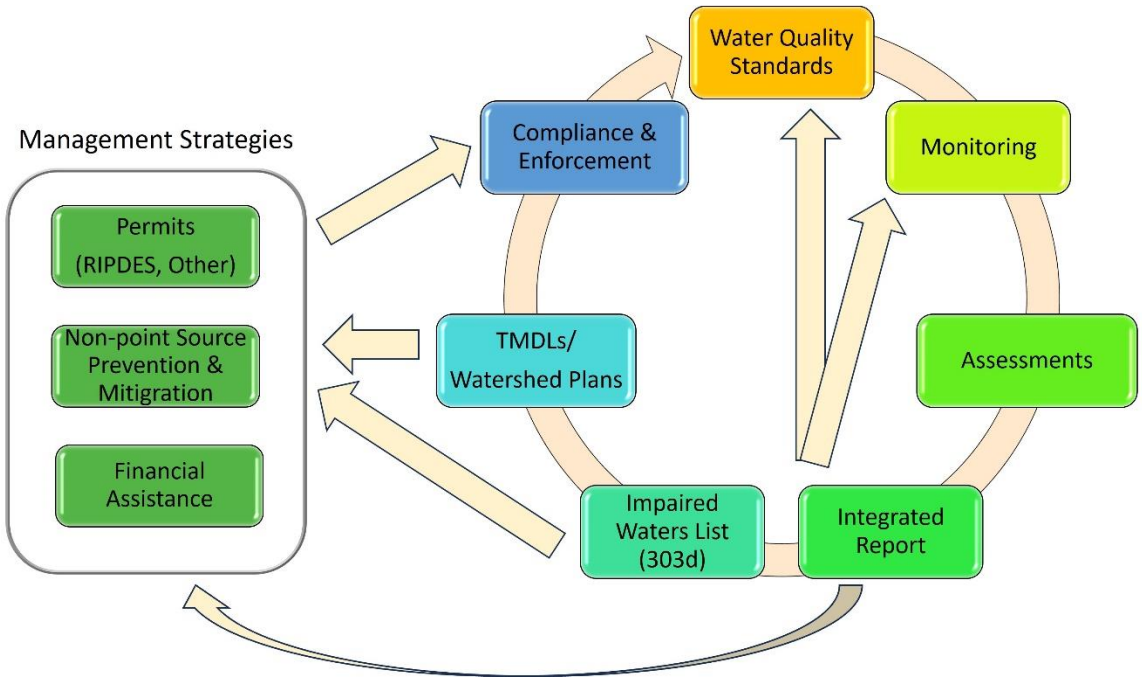
4) Implement the strategies to protect and restore water quality and aquatic habitat;

5) Evaluate results and cycle through the process again using information to adapt management in light of new information.

Rhode Island's water quality management framework incorporates the use of a watershed-based approach to facilitate effective management of our water resources. It reflects implementation of state and federal water pollution statutes, including the federal Clean Water Act. The framework provides a process for government and other stakeholders to prioritize problems and work collaboratively on a watershed basis. Management activities related to water quality and aquatic habitats are integrated within a given watershed to optimize results in terms of both environmental outcomes and societal benefits associated with improved water quality and habitat.

The following graphic describes the specific federal Clean Water Act (CWA) and other state responsibilities and programs implemented by the Rhode Island Department of Environmental Management's Office of Water Resources (RIDEM/OWR) as part of the water quality management process.

[1] State Guide Plan Element: Water Quality 2035: https://dem.ri.gov/sites/g/files/xkgbur861/files/programs/benviron/water/quality/pdf/wqmp2035.pdf



What is the condition of Rhode Island's surface waters?

On a bi-annual basis to comply with federal CWA responsibilities, RIDEM/OWR assesses the quality of the state's surface waters and reports the results in the state's Integrated Water Quality Monitoring and Assessment Report. Waterbodies or waterbody segments are assigned a waterbody identification (WBID) number for purposes of tracking. RIDEM/OWR compiles readily available data and information and evaluates each WBID as meeting or not meeting Rhode Island water quality standards. All WBIDs are placed into a single assessment category, and waters that do not meet water quality standards and require a water quality restoration study referred to as a total maximum daily load (TMDL) are placed onto the 303(d) List (also known as the Category 5 List). Further details on the process are described in the Consolidated Assessment and Listing Methodology (CALM)[2]

For the 2022 assessment cycle, RIDEM/OWR tracked 890 waterbody units statewide including freshwaters and portions of Rhode Island's coastal waters. Water types are categorized as rivers, lakes, or estuarine and coastal. Of these waters, a majority of the water type coverage (miles, acres, or square miles) were tracked and assessed. Of these assessed waters, a majority of river miles and lake/pond acres were considered impaired, and approximately 61% of the impaired river miles and 46% of the impaired lake/pond acres were identified as requiring a TMDL. Of all tracked river miles, 33% require a TMDL, and of all tracked lake/pond acres, 28% require a TMDL. Approximately a third of assessed estuarine square miles are impaired and 90% of those impaired waters require a TMDL (Table 1). Coastal waters consist of the near-shore portions of Rhode Island Sound and the waters surrounding Block Island. All coastal waters are tracked and assessed and found to be meeting water quality standards for recreation and

[2] 2024 Consolidated Assessment and Listing Methodology (CALM) https://dem.ri.gov/sites/g/files/xkgbur861/files/2023-02/calm24.pdf

shellfish consumption. These waters are also the location of many public saltwater beaches, and these water quality assessments do not reflect localized beach closures that are typically temporary in nature and do not represent persistent water quality impacts.

Table 1. 2022 Assessment Statistics

	Rivers (miles)	Lakes and Ponds (acres)	Estuaries (sq. miles)	Coastal (sq. miles)
How many mapped waters are there?[3]	1,420	20,749	159	300
How many have been assigned a tracking ID?	1,376 (**97%**)	18,693 (**90%**)	159 (**100%**)	300 (**100%**)
How much of tracked water type is assessed?	1,087 (**79%**)	15,603 (**84%**)	157 (**99%**)	300 (**100%**)
How many assessed waters are impaired?	751 (**69%**)	11,324 (**73%**)	57 (**36%**)	0 (**0%**)
How many impaired waters require a TMDL?	455 (**61%**)	5,176 (**46%**)	51 (**90%**)	N/A
How many of all tracked waters require a TMDL?	455 (**33%**)	5,176 (**28%**)	51 (**32%**)	N/A

Water quality challenges documented in Rhode Island waters are varied for each water type; however, bacteria, metals, and nutrients and nutrient impacts are common among the top causes for impairments requiring a TMDL (Table 2). It is noted that Non-Native Aquatic Plants, also known as Aquatic Invasive Species (AIS), are a well-documented issue in lakes/ponds and rivers; however, AIS are not caused by a pollutant requiring a TMDL. RIDEM has developed several strategies to address AIS and will continue to support programs to reduce and manage AIS infestations. Further information can be found here: https://dem.ri.gov/environmental-protection-bureau/water-resources/research-monitoring/aquatic-invasive-species-plants

Table 2. Most Prevalent 2022 Water Quality Impairments by Water Type

Rivers	**Lakes and Ponds**	**Estuaries**
Bacteria	Mercury in Fish Tissue	Nutrients and Nutrient Impacts
Metals	Non-Native Aquatic Plants* (Aquatic Invasive Species)	Bacteria
Non-Native Aquatic Plants* (Aquatic Invasive Species)	Nutrients and Nutrient Impacts	Sediment Bioassay

*Impairment not a caused by a pollutant requiring a TMDL

Bacteria - Waterborne pathogens include bacteria, viruses, and other organisms that may cause disease or health problems in humans. In Rhode Island, the assessment of swimming and recreational (boating, etc.) uses is based on enterococci (or fecal coliform) and shellfishing uses on fecal coliform.

[3] Total size in the State at 1:24,000 map scale.

Nutrients – Nutrients are chemical elements that all living organisms need for growth, but in overabundance, nutrients can cause water quality problems. Freshwaters are primarily affected by excess phosphorus, while in coastal waters excess nitrogen is the nutrient of highest concern. In some cases, both nutrients may interact and contribute to the water pollution problem. In surface waters, excess nutrients fuel algal blooms that upset the ecological balance and can lead to water quality degradation in a process known as eutrophication. Severe algal blooms can result in the depletion of oxygen in the water that aquatic life needs for survival. Excess algae also reduce water clarity, preventing the growth of desirable plants (such as sea grasses) and hamper the ability of aquatic life to find food. Cyanobacteria (aka blue-green algae) blooms may result in the release of natural toxins that can be harmful to humans and animals.

Metals – Water or fish tissue containing toxic metals levels can be responsible for health issues in humans and aquatic organisms. Mercury in fish tissue is the most common metal impairment, particularly in lakes/ponds. Other metal impairments are metals present in the water column in toxic amounts, with lead, iron, cadmium, and copper being the most common water column metal impairments. Some waterbodies have multiple water column metal impairments.

Federal Clean Water Act Vision 2.0

Background

In 2013, the U.S. Environmental Protection Agency (USEPA) announced a new program framework to identify and prioritize waterbodies for restoration and protection, entitled "A Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act (CWA) Section 303(d) Program" (referred to as "the Vision" or "Vision 1.0"). The CWA Section 303(d) requires states to identify and list waterbodies that are not expected to meet state water quality standards after the implementation of technology-based controls and require the development of TMDLs. The Vision framework was intended to help foster integration across 303(d) program areas and focus EPA and State efforts to advance the effectiveness of the federal Clean Water Act (CWA) Section 303(d) Program during 2013 - 2022. For the past ten years, states and territories have been using the Goals outlined in Vision 1.0 to guide program management.

Beginning in 2024, states and territories will begin implementation of the USEPA's 2022 – 2032 Vision for the Clean Water Act Section 303(d) Program (referred to as "2022 Vision" or "Vision 2.0"). The Vision 2.0 framework[4] renews support of the initial Vision 1.0 goals of Planning and Prioritization, Restoration, Protection, Data and Analysis, and Partnerships and introduces new focus areas of Environmental Justice, Climate Change, Tribal Water Quality and Program Development, and Program Capacity Building. This document describes how Rhode Island's water quality management framework supports these goals and focus areas in forthcoming sections.

CWA 303(d) statutory and regulatory obligations remain unchanged, including the requirement to update on a biannual basis the state's 303(d) list, which identifies and prioritizes the state's impaired waters for TMDL development. The TMDL Vision Framework allows the state to

[4] https://www.epa.gov/system/files/documents/2022-09/CWA%20Section%20303d%20Vision_September%202022.pdf

articulate high priority waters for TMDL development (2022 - 2032) in the context of the State's broader overall water quality goals. As such, the Vision Priorities represent a subset of the priority ranking required by CWA statutory obligation.

Planning and Prioritization Goal

The intent of the Prioritization Goal is articulated in the following Vision 2.0 goal statement:

> *States, territories, and tribes develop a holistic strategy for implementation of Vision Goals, systematically prioritize water or watersheds for TMDL and other plan development (restoration and/or protection), and report on the progress towards development of plans for priority waters.*

RIDEM/OWR has developed its CWA Vision priorities within the context of the state's ongoing water quality management and planning efforts, described previously. The long-term goal for all Rhode Island watersheds is to achieve clean and healthy waters. At the state scale, it is important to identify which water quality stressors and watersheds or waterbodies will be the focus of attention within the limited resources of state water resource programs. These well-established priorities emphasize protection of public health and healthy aquatic habitats.

For the period from 2022 – 2032, RIDEM/OWR's priorities are aligned with those designated uses protecting public health and healthy aquatic habitats as adopted as state policy through Rhode Island's State Guide Plan Element: Water Quality 2035. The Guide Plan Element includes the following objectives:

- Protection and restoration of **drinking water supplies**;
- Protection and restoration of **shellfish growing area waters**;
- Protection and restoration of waters used for **public recreation including beaches**;
- Protection and restoration of **high quality aquatic habitats**.

As allowed by USEPA Vision 2.0 guidance, RIDEM/OWR selection of Vision 2.0 priority waters for TMDL development within the broader water quality objectives listed above will be identified in two-year increments during the period 2022 - 2032. To address the gap between Vision 1.0 completion in 2022 and Vision 2.0 initiation in 2024, EPA instructed states to select bridge period priorities for federal FY23 – 24. Bridge period priorities are to be completed by September 30, 2024. For the remainder of the Vision 2.0 period (2024 – 2032), specific waterbody assessment unit Vision 2.0 priorities will be identified in two-year increments until completion of the Vision 2.0 period in 2032.

For the bridge period, RIDEM/OWR selected a bridge period priority of TMDL completion for bacteria (enterococcus) impairments of three tributaries to a public drinking water supply reservoir, Nonquit Pond, in the Newport Water Supply system:

Table 3. 303(d) Vision Bridge TMDL Priorities for FY23 - 24

Waterbody Description	Municipality	WBID	Impairment(s)*
Borden Brook	Tiverton and Little Compton	RI0010031R-01	**Enterococcus**, Total Phosphorus
Quaker Creek	Tiverton	RI0010031R-04	**Enterococcus**, Total Phosphorus, Iron
Tributary to Nonquit Pond	Tiverton	RI0010031R-20	**Enterococcus**, Total Phosphorus

*Bold impairments are FY23 - 24 bridge metric TMDL for completion. TMDLs approved by USEPA September 2023.

The TMDLs developed for the three tributaries serve as an extension of the Rhode Island Statewide Bacteria TMDL approved by USEPA in 2011. The Nonquit Tributaries enterococcus TMDLs relied, in part, on portions of the Rhode Island Statewide Bacteria TMDL to satisfy federal TMDL requirements. The Nonquit Tributaries TMDL documents present a crosswalk of required TMDL elements from the 2011 Statewide Bacteria TMDL, as well as the waterbody summary appendices containing specific waterbody and watershed descriptions, data analysis, and sources. The USEPA approved the Nonquit Pond tributary appendices September 2023. Full approved documents are available: https://dem.ri.gov/environmental-protection-bureau/water-resources/research-monitoring/rhode-island-statewide-bacteria-tmdl

During the Vision 1.0 prioritization, RIDEM selected development of TMDLs for the nine Newport Water Supply reservoirs that experience algal and cyanobacteria blooms. The TMDLs addressing the Newport Water Supply reservoirs' total phosphorus and total organic carbon (TOC) impairments were completed and approved by EPA in 2021[5]. Tributaries to the Newport Water Supply reservoirs are also impaired for total phosphorus. The TMDLs for the tributaries are in development for completion in 2025, including the Borden Brook, Quaker Creek, and Tributary to Nonquit Pond total phosphorus impairments in Table 3. The iron impairment for Quaker Creek is scheduled for completion in 2030 at this time.

Rhode Island's Potential TMDL Core Areas for Vision 2.0

Based on current understanding of Rhode Island's water quality challenges, as described earlier, RIDEM identified and evaluated the following five potential core areas of planning and prioritization for TMDL completion under the Vision 2.0 Planning Process. Among these potential core areas, the options for Rhode Island to pursue at this time are Lake Nutrient Impairments and Shellfish Pre-closure Bacteria Impairments as detailed below. These areas may be updated and adapted to new scientific understanding that develops over time, including

[5] Newport Water Supply TMDL https://dem.ri.gov/sites/g/files/xkgbur861/files/programs/benviron/water/quality/rest/pdfs/Newport-Water-Supply-TMDL.pdf

information about emerging contaminants. The Protection Goal found later in this document includes further discussion of general watershed planning carried out by RIDEM/OWR.

1. *Lake Nutrient Impairments*

RIDEM/OWR has documented 48 lake/pond segments that are impaired for total phosphorus. Of these impaired lake/pond segments, 18 still require a TMDL.[6] As noted earlier, excessive total phosphorus can cause a wide range of impacts to freshwater lakes including cyanobacteria (aka blue-green algae) blooms[7] that can produce toxins that harm people and animals and low dissolved oxygen that can impact aquatic life, including fish kills. RIDEM/OWR has experience with development of lake nutrient impairment TMDLs and is currently working to develop TMDLs for Melville Ponds (Portsmouth, RI) and, with assistance from USEPA contractors, Valley Falls Pond (Central Falls, RI). At this time, the development of lake nutrient TMDLs have been identified as Vision priorities for completion in the Vision 2.0 period 2022 – 2032.

2. *Shellfising Pre-Closures*

Shellfish grown and harvested in Rhode Island continues to be a quality safe seafood product. This is achieved by diligent monitoring of shellfish harvesting waters to protect public health. RIDEM/OWR in conjunction with RIDEM Marine Fisheries and the Rhode Island Department of Health (RIDOH) manages shellfishing in Rhode Island waters based on the U.S. Food and Drug Administration's National Shellfish Sanitation Program (NSSP) model ordinance. Recent monitoring from some areas currently open to shellfishing has shown bacteria concentrations are increasing and coming closer to the threshold for closure. While the estuarine areas are not currently closed or impaired, the upstream tributaries to these waterbodies are impaired for bacteria or lack data to assess impairment status. Bacteria TMDL development in the upstream freshwater tributaries could spur implementation in the watershed restoring the upstream waters and protecting the downstream shellfishing waters. RIDEM/OWR has experience with development of river/stream bacteria TMDLs and continues to utilize the 2011 statewide bacteria TMDL as an effective and efficient way to complete bacteria TMDLs. At this time, the development of bacteria TMDLs for protection and restoration of shellfishing in coastal waters and their tributaries have been identified as Vision priorities for completion in the Vision 2.0 period 2022 – 2032.

3. *Salt Pond Eutrophication*

The Salt Pond Region of southern Rhode Island extends from Westerly to Narragansett Bay and includes Maschaug, Winnapaug, Quonochontaug, Ninigret, Green Hill, Trustom, Cards, Potters, and Point Judith Ponds. The salt ponds are coastal lagoons, which are shallow, productive marine embayments separated from the ocean by barrier spits. As documented in the Salt Pond Region Special Area Management Plan (SAMP)[8], effects of watershed development, including nutrient impacts, have been documented since the 1980s. The nutrient dynamics and resulting impacts would take substantial fieldwork and modeling to develop TMDLs, which has not been initiated nor funding secured to date. Additionally, there are data gaps regarding spatial extent of impairment. Future TMDL work could address these data and analysis gaps to complete

[6] Two of the 18 lakes/ponds total phosphorus TMDLs are currently or will soon be under development.
[7] Rhode Island DEM Cyanobacteria website: www.dem.ri.gov/bluegreen
[8] Rhode Island's Salt Pond Region: A Special Area Management Plan http://www.crmc.ri.gov/regulations/SAMP_SaltPond.pdf

TMDLs or other management strategies for impaired salt ponds. At this time, addressing Salt Pond eutrophication through the TMDL program as part of the Vision 2.0 would be contingent on securing significant additional resources.

4. *Tribal Water Quality*

Under the Vision 2.0, one of EPA's focus areas is tribal nations' programmatic capacity and water quality. In Rhode Island, there is one federally recognized tribe, the Narragansett Indian Tribe[9]. The recognized tribal lands partially or wholly contain four surface waterbodies: School House Pond (RI0010043L-09), Deep Pond (RI0010043L-08), Cedar Swamp Brook (RI0008039R-04), and Tributary to Ninigret Pond (RI0010043R-12). Both ponds are impaired for mercury in fish tissue, and Tributary to Ninigret Pond and Cedar Swamp Brook[10] are assessed as meeting some uses. While a Northeast Regional Mercury in Fish Tissue TMDL was completed[11], analysis of consumption rates specific to Narragansett tribal practices and updated atmospheric modeling of mercury has not been completed to date and would take significant investment that has not been secured. Future TMDL work could address these data and analysis gaps to complete mercury in fish tissue TMDLs for School House and Deep Ponds. At this time, TMDL development to address Mercury in Fish Tissue impairments in waters on tribal lands is not included in the Vision 2.0 Period (2022 – 2032). Future work in this area would require a commitment of additional resources.

5. *Metals in Rivers*

RIDEM/OWR has documented 45 river segments impaired for metals and some river segments have multiple metals causing impairment. Of these impaired river segments, 30 still require a TMDL. Development of metals TMDLs can be fairly extensive, with difficulty in capturing field conditions to address wet weather and/or chronic impacts of metals. Some metals impairments are located in fairly remote/rural locations without an obvious sourcing and may be related to historic waste/dumping locations, which are under authority of the RIDEM's Office of Land Revitalization and Sustainable Materials Management (OLRSMM). Other clean-up options may be more effective at remediating the metals impairments than development of TMDLs. Future work in these areas should first focus on management strategies other than TMDL development. For these reasons at this time, Metals in Rivers impairments are not included in the Vision 2.0 Period (2022 – 2032).

Restoration Goal

The intent of the Restoration Goal is articulated in the following Vision 2.0 goal statement:

> *States, territories, and tribes design TMDLs and other restoration plans to attain and maintain water quality standards, facilitate effective implementation, and drive restoration of impaired waters.*

[9] Indian Entities Recognized by and Eligible to Receive Services From the United States Bureau of Indian Affairs https://www.federalregister.gov/documents/2023/01/12/2023-00504/indian-entities-recognized-by-and-eligible-to-receive-services-from-the-united-states-bureau-of

[10] Data collected in coordination with the Narragansett Tribe in 2022 is expected to be finalized in the 2024 assessment cycle

[11] Northeast Regional Mercury TMDL https://neiwpcc.org/our-programs/nps/mercury/mercury-tmdl/

The Restoration Goal description acknowledges that TMDLs will remain the most dominant programmatic tool for addressing impaired waters, but encourages states to identify, evaluate, and promote, as appropriate, other tools that may be more immediately beneficial or practicable to achieving water quality standards. Within this framework, an alternative approach to a TMDL may be pursued in the near term for specific impaired waters, which would remain on the state's 303(d) List of Impaired Waters until water quality standards are attained but are assigned a low priority for TMDL development as alternative approaches are pursued.

RIDEM has and will continue to look for the most effective approach, TMDL or non-TMDL, to advance water quality improvements and ultimately achieve water quality standards. RIDEM applies an adaptive management approach in the scheduling of TMDLs for impairments where studies and/or models have documented that specific source(s) are the predominate cause of the impairment and pollution control requirements are in place that are reasonably expected to result in attainment of applicable water quality standard(s) in the near future. Low priority for TMDL development has been assigned to these impairments as compliance with the required actions is expected to result in water quality improvements and possibly negate the need for a TMDL.

In recent assessment cycles, RIDEM has successfully delisted (removed impairments) from waterbodies by pursuing management options prior to TMDL development. Examples are listed below:

- **Lower Wood River** below Alton Pond dam was impaired for biodiversity impacts in 1998 and unknown toxicity[12] in 2000. The RIDEM Office of Waste Management[13] State Site Remediation Program oversaw remediation of a former textile manufacturing facility resulting in effective reduction in the mass of contaminants discharging to the Wood River.
    - Benthic macroinvertebrate bioassessments and ambient bioassays – chronic aquatic toxicity impairments were removed in the 2016 assessment cycle
- **Mt. Hope Bay** was impaired for temperature and fish bioassessments in 2000 due to the thermal discharge from Brayton Point Station, which was at one point the largest fossil fuel burning power plant in New England. Through USEPA permitting and cooperative management efforts of MADEP and RIDEM, limits were placed on the cooling water heat load allowed to be discharged into Mt. Hope Bay and thermal discharge ceased after permanent closure of the facility.
    - Water temperature impairment removed in the 2016 assessment cycle
    - Fish bioassessment impairment removed in the combined 2018 – 2020 assessment cycle
- **Upper Narragansett Bay** was impaired for fecal coliform in 1992. Early stormwater infrastructure often included systems call combined sewers, which carry rainwater and sewage in the same pipe. During heavy rainstorms, flows in combined sewers exceed the system capacity and overflow into nearby waterbodies. The Narragansett Bay Commission (NBC) is the sewer authority overseeing the combined sewers that drain to Upper Narragansett Bay. Combined sewer overflows (CSOs) are in violation of the

[12] Biodiversity impacts and unknown toxicity were changed to benthic macroinvertebrate bioassessments and ambient bioassays – chronic aquatic toxicity in the 2008 cycle for database updates

[13] RIDEM Office of Waste Management was rebranded to Office of Land Revitalization and Sustainable Materials Management

federal Clean Water Act and caused impairment of shellfishing in Upper Narragansett Bay. Utilizing CSO Abatement Program and consent agreements to ensure reduction and abatement of CSOs, two major phases of deep rock tunnels and underground storage facilities have been completed to date[14]. This has eliminated a significant volume of combined sewage and stormwater that previously discharged to the upstream rivers and entered the Upper Bay via the Providence River, which has led to reclassification of shellfishing to approved in a portion of Upper Narragansett Bay.

    - Fecal coliform impairment was removed from a portion of Upper Narragansett Bay in the combined 2018 – 2020 assessment cycle

- **Blackstone River and Pawtuxet River Main Stem** were both listed as impaired for nutrients and nutrient impacts in the mid-1990s. RIDEM/OWR is delegated by the USEPA to issue National Pollutant Discharge Elimination System (NPDES) permits, commonly referred to in Rhode Island as RIPDES. Over several permit issuance cycles, the RIDPES permits for the wastewater treatment facilities (WWTF) on these rivers were modified to decrease allowable loads of nutrients. Additionally, the USEPA issued NPDES permits with nutrient load reductions for Massachusetts facilities on the Blackstone River. The issuance of the permits and subsequent construction at the facilities eliminated a significant amount of the nutrient loads to both rivers, which allowed for removal of nutrient and nutrient impact impairments.
    - Total phosphorus and dissolved oxygen impairments removed from the Blackstone River in the combined 2018 – 2020 assessment cycle.
    - Dissolved oxygen impairment in the 2008 assessment cycle and total phosphorus impairment in the 2022 assessment cycle were removed from Pawtuxet River Main Stem.

To advance water quality restoration, RIDEM/OWR expects to continue to specify TMDL development projects as the identified Vision 2.0 priorities. However, where appropriate, RIDEM/OWR may elect to pursue alternative approaches consistent with Rhode Island's water quality framework and guidance developed by USEPA under the Restoration Goal.

Protection Goal

The intent of the Protection Goal is articulated in the following Vision 2.0 goal statement:

> *In addition to recognizing the protection benefits that TMDLs and other restoration plans can provide, states, territories, and tribes may develop protection plans to prevent impairments and improve water quality, as part of a holistic watershed approach.*

The intent of the Protection goal is to encourage a proactive and holistic consideration of management action to protect and sustain healthy waters. The long-term goal for all Rhode Island watersheds is to achieve clean and healthy waters and aquatic habitats. While TMDL development is typically focused on specific pollutants, RIDEM/OWR also utilizes watershed planning at different scales to promote more effective protection of water resources. On the state level, development of plans may take the form of Nonpoint Source Management 9-

[14] A third phase of CSO, divided into 4 sub-phases, is underway, and a third deep rock tunnel is under construction at the time of this report.

Element Watershed Plans, CRMC Special Area Management Plans (SAMPs), and Water Supply Protection Plans.

These various water quality planning efforts are increasingly taking into account and being integrated with resiliency planning including Rhode Island's Municipal Resiliency Program. As resources have allowed, Rhode Island has invested in personnel to support planning and coordination of efforts across watersheds; for example Rhode Island Infrastructure Bank's (RIIB) resiliency coordinator for Aquidneck Island. Additionally, Rhode Island is encouraging the development of lake management plans to address both water pollution concerns and the challenges associated with aquatic invasive plants.

Implementation of water quality protection occurs in large part through existing regulatory programs that protect water quality and prevent pollution from a variety of sources. These programs are administered on a statewide basis across all watersheds as applicable. In Rhode Island, such programs include, but are not limited to, regulation of wastewater and stormwater discharges to surface waters and groundwater, biosolids, solid and hazardous waste storage, handling and disposal, oil storage facilities, and air emissions among others. Well-established priorities related to the use of surface and ground waters have been incorporated into RIDEM statewide water quality programs, including regulations which afford added protection to drinking water sources through tighter restrictions on activities that present pollution threats.

In addition, RIDEM/OWR and CRMC regulate the alteration of wetlands with the aim of avoiding and minimizing impacts from land development and other regulated activities. RIDEM and CRMC undertook rulemaking to implement legislative changes to the Rhode Island's Freshwater Wetlands Act which mandated the establishment of standards for buffers to strengthen protection of the state's wetlands including rivers and ponds. New RIDEM/OWR and CRMC rules went into effect in July 2022 and reflect a tiered approach that takes into consideration watershed characteristics, existing land use, vulnerability and extent of the wetland resource, and wetland function among other characteristics.

Water quality protection is also supported and incentivized through technical and financial assistance efforts. RIDEM/OWR, other state agencies as well as partners, provide technical assistance in areas such as aquatic habitat restoration, green infrastructure, stormwater management etc. For major water pollution control projects, the Rhode Island Infrastructure Bank (RIIB) partners with the RIDEM/OWR on the Rhode Island Clean Water State Revolving Fund (CWSRF). RIIB also offers several other financial assistance programs. Federal, state and other grant programs are also important to advancing the design and implementation of both protection and restoration actions.

Data and Analysis Goal

The intent of the Data and Analysis Goal is articulated in the following Vision 2.0 goal statement:

> *The CWA Section 303(d) program coordinates with other government and non-governmental stakeholders to facilitate data production and sharing, and effectively analyzes data and information necessary to fulfill its multiple functions.*

The Data and Analysis Goal highlights multiple ways that states, territories, and tribes can expand on and improve the data and information available for CWA Section 303(d) functions. States, territories, and tribes are encouraged to collaborate and foster effective data sharing processes internally and externally as part of this goal. As part of its ongoing approach to monitoring the status of its surface waters, RIDEM/OWR will continue to assess waters in accordance with a Consolidated Assessment and Listing Methodology (CALM), Comprehensive State Monitoring and Assessment Strategy, applicable criteria and water quality standards, and appropriate sampling, data analysis, and assessment techniques for all water resource types, as required by the CWA and other federal and state statutes.

Since the initial electronic data submission process, RIDEM has continued to provide as much detailed information on how to submit data for consideration in the assessment process and worked with data providers to address gaps in submission as possible. Beginning in 2020, RIDEM/OWR, with support from a USEPA Exchange Network grant, began an update of the in-house RIDEM/OWR water quality database, SWIMS. New tools built in SWIMS will allow faster processing of assessment decisions and timely submission of 303(d) reports. RIDEM/OWR expects to develop assessment protocols through the Vision 2.0 period to support greatest use of SWIMS and other data tools.

Additionally, RIDEM Office of Water Resources has been working with RI Department of Information Technology (DoIT) to update the node conversion program in SWIMS for submission of water chemistry data to EPA's Water Quality Exchange (WQX) Network. The first dataset was uploaded and is live on WQX and EPA's How's My Waterway. Further submission of datasets through SWIMS to WQX will foster further discussion about data availability in watersheds and potentially address data gaps with outside partners.

Previous reviews of available monitoring data have documented gaps in information needed to support assessments. Among the gaps related to public health are a lack of data concerning fish tissue contamination, concerns regarding insufficient monitoring at freshwater beaches and public boat launch sites, and limited monitoring of cyanobacteria blooms. Resource constraints at both RIDEM/OWR and Rhode Island Department of Health (RIDOH) currently limit sustainable data collection; however, progress has been made on mercury in fish tissue data gaps with support from U.S. EPA Region 1 Laboratory and U.S. Food and Drug Administration Laboratory. RIDEM/OWR has committed to assessing all lakes/ponds with public access for mercury in fish tissue, and 100% of lakes/ponds with cement ramps and 75% of light craft access lakes/ponds have been sampled and assessed for fish consumption to date.

Partnerships Goal

The intent of the Partnerships Goal is articulated in the following Vision 2.0 goal statement:

> *The CWA Section 303(d) program meaningfully communicates and collaborates with other government programs and non-governmental stakeholders to restore and protect water quality effectively and sustainably.*

The intent of the partnerships goal is to encourage communication with governmental entities and non-governmental stakeholders in ways that leads to productive sustained collaboration

and ultimately better water quality. With respect to TMDL program activities, the goal consists of two distinct but related approaches: programmatic coordination and stakeholder involvement and engagement.

RIDEM/OWR's 303(d) and TMDL programs have evolved communication pathways over the years to deliver messaging on several different platforms: in person meetings, virtual and/or hybrid meetings, social media, and website messaging. During RIDEM/OWR TMDL development, it is common practice for RIDEM/OWR to engage with municipal authorities, non-governmental organizations, conservation districts, and environmental advocacy groups including through initial kickoff meeting(s), continued communication during the development of models and loads, and a public comment period with workshop describing the process following completion of the draft TMDL documentation.

Current collaboration in TMDL development includes participation in a bi-state effort with the Connecticut Department of Energy and Environmental Protection (CTDEEP) to develop TMDLs for the shared Tidal Pawcatuck and Little Narragansett Bay. Additionally, RIDEM is receiving USEPA contractor support to develop an environmental justice oriented TMDL for Valley Falls Pond in Central Falls, Rhode Island. Other recent collaboration included initiation of technical advisory committee including municipal, state, and federal partners to propose methods for development of the Newport Water Supply TMDL to reduce nutrients and associated algal blooms. RIDEM will continue to engage various stakeholders and explore new avenues of collaboration and communication.

With respect to the broader range of protection activities, RI makes use of a number of formal and informal coordination mechanisms to foster collaboration. Rhode Island's small size offers an advantage for building strong relationships among government agencies, partner organization staff and volunteers. The Rhode Island Rivers Council provides an example of a formal means to foster information exchange and collaboration on watershed issues and concerns. RIDEM/OWR also participates in regional partnership programs (Examples - SNEP, NEIWPCC, NBEP, NBERR, NRCS Technical Team) and works closely with non-governmental organizations and local entities on various projects and initiatives. Additional description of coordination mechanisms is included Water Quality 2035 and the Rhode Island Nonpoint Source Pollution Management Plan.

Focus Areas of the Clean Water Act Vision 2.0

Environmental Justice

The objective of the environmental justice focus area is to actively consider environmental justice in assessment, listing, TMDLs, and other restoration and protection plans to address disproportionately high and adverse environmental, water quality, climate-related, and other relevant impacts on underserved communities. RIDEM has been active in monitoring, assessing, and completing TMDLs in environmental justice communities. Appendix A contains a table listing TMDLs completed in waterbodies with environmental justice communities. A total of 13 waterbodies and 38 impairment TMDLs with environmental justice communities have been completed to date.

RIDEM developed and released in September 2023 an environmental justice policy to guide all programs within the Department, including the RIDEM/OWR.[15] RIDEM also hired a position focused on Climate Justice within the Director's office to better inform and collaborate with underserved and underrepresented Rhode Island communities, which will help to guide RIDEM priorities and policy across all offices and divisions. Consistent with RIDEM's policy, RIDEM/OWR is actively reviewing its programs and will be identifying actions to enhance engagement with EJ communities including making important information about water quality conditions available in more languages.

As noted earlier, further focus on creating more accessible public communication and interaction in the TMDL program is also being fostered by support from the USEPA to complete an environmental justice-focused TMDL for Valley Falls Pond. Valley Falls Pond is located within Central Falls, Rhode Island. Several impairments have been documented in the pond. It was originally placed on Rhode Island's 1998 303(d) list for total phosphorus, dissolved oxygen, lead, and fecal coliform. Additionally, a non-native aquatic plant non-pollutant impairment was identified in 2016 due to a dense infestation of water chestnut.

Related efforts are on-going to mitigate the growth of water chestnut, restore the lake and provide better recreational opportunities for the residents of Central Falls and surrounding communities. A lake management plan has been developed to assist the City of Central Falls with future management options and recommendations for the control of invasive aquatic vegetation in the pond. As of June 2023, two treatments of the pond with herbicide have been conducted to reduce plant matter. The lake management plan also notes further reduction in pollutants is needed to achieve improved water quality following plant material reduction, and completion of the TMDLs for total phosphorus, dissolved oxygen, lead, and enterococcus[16] will greatly advance this process.

Climate Change

The objective of the climate change focus area is to consider strategically how to account for the impacts of climate change and address climate resiliency or vulnerability in water quality assessment, impaired waters listing, and the development of TMDLs and other plans consistent with water quality standards.

Rhode Island law established the Executive Climate Change Coordinating Council (EC4) in 2014 and updated in 2021 by the Act on Climate, which codifies specific greenhouse gas reduction targets. The legislation emphasizes the concept of resilience and taking actions to adapt and mitigate impacts of climate change. The 13-member council is chaired by the RIDEM Director. RIDEM is committed to reviewing available science and refining the approach to addressing climate change in Rhode Island across all offices and divisions. Evaluating adoption of climate approach integration into TMDLs is an evolving area of research and will be considered as appropriate in individual TMDLs.

[15] Department of Environmental Management Environmental Justice Policy, Version 1.4 – September 28, 2023 https://dem.ri.gov/sites/g/files/xkgbur861/files/2023-09/ridem-environmental-justice-policy_0.pdf

[16] At the time of the original 1998 impairment, fecal coliform was the preferred fecal indicator bacteria for assessment of recreational use. Enterococcus is the current preferred fecal indicator bacteria. RIDEM intends to develop the TMDL for enterococci to address the bacteria impairment.

Tribal Water Quality and Program Development

As noted earlier, in Rhode Island there is one federally recognized tribe, the Narragansett Indian Tribe. As part of the statewide assessment of water quality, the RIDEM/OWR includes a review of surface waterbodies located partially or wholly on tribal lands. These surface waters include two ponds and two rivers/streams as listed below:

Table 4. Waterbodies located partially or wholly on tribal lands

Waterbody Description	WBID	2022 Assessment Status	Impairment(s)
School House Pond	RI0010043L-09	Impaired Fish Consumption (Requires TMDL)	Mercury in Fish Tissue
Deep Pond	RI0010043L-08	Impaired Fish Consumption (Requires TMDL)	Mercury in Fish Tissue
Cedar Swamp Brook	RI0008039R-04	Meets some uses*	No impairments documented
Tributary to Ninigret Pond	RI0010043R-12	Meets some uses	No impairments documented

*Assessed for the first time during the 2024 assessment cycle

Given available data, RIDEM has exercised its authority and assessed the water quality conditions in the waterbodies associated with tribal lands consistent with the RIDEM Water Quality Standards and the related CALM document. RIDEM/OWR will continue to collaborate with the Tribe with respect to data collection, assessment, and TMDL development. RIDEM routinely meets with the Tribe on a leadership level that promotes meaningful government-to-government consultation and enables dialogue on issues related to CWA Section 303(d) program activities of tribal interests among other topics. RIDEM continues to be open to exploring future partnerships with the Narragansett Tribe to advance work on water quality issues of mutual interest.

Program Capacity Building

The objective of the program building focus area is to expand and build upon existing activities and resources to improve understanding of CWA Section 303(d) program foundations, familiarity with tools and various approaches to regular tasks and complex circumstances, and ability to accomplish statutory responsibilities and Vision Goals more efficiently and effectively.

RIDEM will continue to explore new tools and approaches to assessment, alternative restoration and protection, and TMDL development. Foundational to the 303(d), assessments, Water Quality Standards, and TMDL development is monitoring data. While essential to the programs, RIDEM/OWR continues to lack a state employee position that is specifically dedicated to water quality monitoring, with the exception of the shellfish growing area monitoring program, including coordination with volunteer monitoring groups. Many RIDEM/OWR monitoring responsibilities are carried out by contractual and/or seasonal employees. This work has been coordinated by staff with other major responsibilities within CWA required programs. As a

result, building state program staffing capacity for monitoring is a priority need identified for RIDEM/OWR.

Another area of need is updated electronic assessment and water quality standards tracking. While new assessment tools have been built into the existing SWIMS database, a long-term need is to move to an updated electronic assessment database that will enhance both internal and public access to assessment information and data. Tools to facilitate tracking of water quality conditions over time are needed to support documentation of progress toward clean water goals. While ATTAINS, USEPA's national assessment database, has some features to accomplish the proposed assessment tracking, an internally controlled database that allows for customization to state water quality standards and narrative documentation of long-term waterbody history is needed.

RIDEM notes there are additional needs related to protection and restoration of water resources. Priorities include stable funding for on-going monitoring and investment to reduce critical monitoring gaps, including stream gaging. Funding to support larger water quality modeling studies, which in some cases are needed for TMDL development, is another need. Current staffing levels constrain the pace of TMDL development and the capacity of RIDEM/OWR to meet public demands for technical assistance, including through participation on project teams. In 2023, RIDEM/OWR was able to dedicate a new state employee to lake management issues which has greatly improved RIDEM/OWR's capacity to respond to growing public concerns about lakes, such as aquatic invasive species and cyanobacteria, but further needs remain.

Appendix A

TMDLs Completed in Environmental Justice Areas

*Bolded have a completed TMDL. For most details on TMDLs, see: https://dem.ri.gov/environmental-protection-bureau/water-resources/research-monitoring/restoration-studies-tmdl-documents

Waterbody Description	**Municipality with EJ Area Segment**	**WBID**	**Impairment(s)***
Cherry Brook	Woonsocket	RI0001003R-02	**Copper, Enterococcus, Fecal coliform,** Benthic Macroinvertebrate Bioassessments
Blackstone River	Woonsocket, Central Falls	RI0001003R-01A	**Cadmium, Enterococcus, Fecal coliform**, Mercury in Fish Tissue, PCBs in Fish Tissue, Iron, Non-Native Aquatic Plants
Blackstone River	Pawtucket, Central Falls	RI0001003R-01B	**Cadmium,** Mercury in Fish Tissue, PCBs in Fish Tissue, Iron, Enterococcus, Fecal coliform
West River	Providence	RI0003008R-03B	**Enterococcus,** Benthic Macroinvertebrate Bioassessments
Woonasquatucket River	Providence	RI0002007R-10D	**Zinc, Lead, Copper**, Mercury, Dioxin (including 2,3,7,8-TCDD), Non-native Aquatic Plants, Enterococcus, PCBs in Fish Tissue, Mercury in Fish Tissue, Polychlorinated biphenyls (PCBs), Dissolved Oxygen

Woonasquatucket River	North Providence, Providence	RI0002007R-10C	**Fecal coliform,** Dioxin (including 2,3,7,8-TCDD), Mercury in Fish Tissue PCBs in Fish Tissue, Dissolved Oxygen, Mercury, Non-native Aquatic Plants, Polychlorinated biphenyls (PCBs)
Ten Mile River	Pawtucket	RI0004009R-01A	**Aluminum, Total Phosphorus, Cadmium, Iron, Lead, Enterococcus, Fecal coliform**, Non-Native Aquatic Plants
Ten Mile River	East Providence	RI0004009R-01B	**Aluminum, Cadmium,** Non-Native Aquatic Plants, Enterococcus
Omega Pond	East Providence	RI0004009L-03	**Aluminum, Total Phosphorus, Cadmium, Dissolved Oxygen, Fecal coliform,** Non-Native Aquatic Plants
Runnins River	East Providence	RI0007021R-01	**Fecal coliform,** Dissolved Oxygen, Lead
Barrington River	East Providence	RI0007021E-01A	**Fecal coliform**
Mashapaug Pond	Providence	RI0006017L-06	**Chlorophyll-a, Dissolved Oxygen Total Phosphorus, Fecal coliform,** PCBs in Fish Tissue
Roger Williams Park Ponds	Providence	RI0006017L-05	**Chlorophyll-a, Dissolved Oxygen Total Phosphorus, Fecal coliform,** Non-Native Aquatic Plants