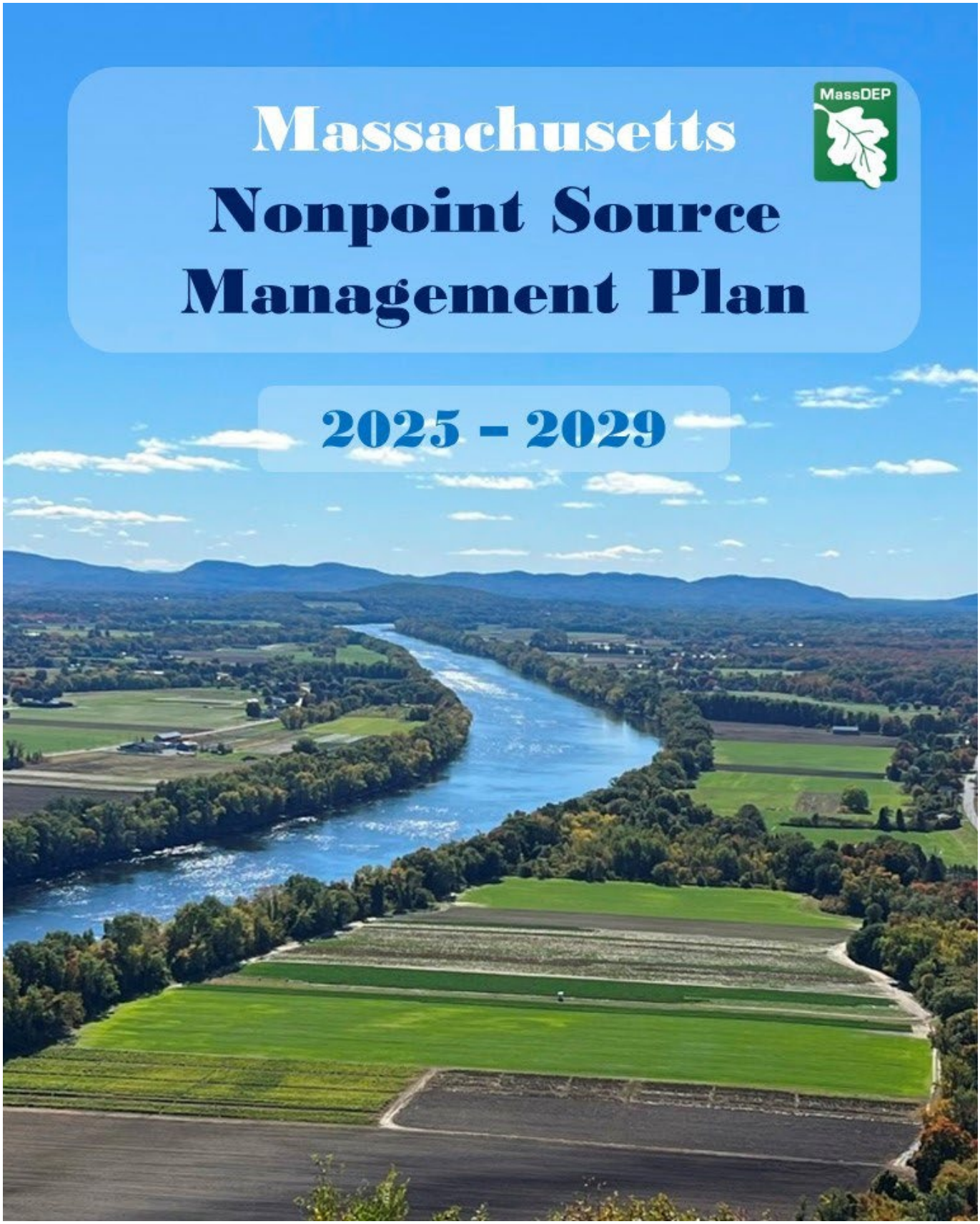
Massachusetts Nonpoint Source Management Plan

2025 – 2029



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Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
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Massachusetts Department of Environmental Protection
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2025 – 2029

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Massachusetts Department of Environmental Protection

The Massachusetts Department of Environmental Protection's (MassDEP) mission is to protect and enhance the Commonwealth's natural resources – air, water, and land – to provide for the health, safety, and welfare of all people, and to ensure a clean and safe environment for future generations. In carrying out this mission MassDEP commits to address and advance environmental justice and equity for all people of the Commonwealth; provide meaningful, inclusive opportunities for people to participate in agency decisions that affect their lives; and ensure a diverse workforce that reflects the communities we serve.

Watershed Planning Program

The mission of the Watershed Planning Program (WPP) in the Massachusetts Department of Environmental Protection is to protect, enhance, and restore the quality and value of the waters of the Commonwealth. Guided by the federal Clean Water Act, WPP implements this mission statewide through five Sections that each have a different technical focus: (1) Surface Water Quality Standards; (2) Surface Water Quality Monitoring; (3) Data Management and Water Quality Assessment; (4) Total Maximum Daily Load; and (5) Nonpoint Source Management. Together with other MassDEP programs and state environmental agencies, WPP shares in the duty and responsibility to secure the environmental, recreational, and public health benefits of clean water for all people of the Commonwealth.

Acknowledgements

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Disclaimer

References to trade names, commercial products, manufacturers, or distributors in this report constituted neither endorsement nor recommendation by MassDEP.

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EXECUTIVE SUMMARY

The Massachusetts Department of Environmental Protection (MassDEP), through the Nonpoint Source (NPS) Management Section in the Watershed Planning Program, presents the Massachusetts NPS Management Program Plan (2025 – 2029), as required in section 319 of the Clean Water Act and the US Environmental Protection Agency's Nonpoint Source Program and Grants Guidelines for States and Territories (USEPA, 2024), to meet the overarching goal of NPS pollution mitigation in the Commonwealth by restoring impaired waters and protecting healthy waters. The Plan includes a new NPS vision to equitably support watershed-based planning and the implementation of climate-resilient best management practices (BMPs) statewide.

The theme of the Plan is *meeting communities where they are*, as it describes an NPS roadmap to assist communities regardless of where they are in the NPS management process. The objective is to help communities secure financial support and access beneficial tools at every step of their journey in restoring impaired waters and protecting healthy waters.

The two central priorities of this five-year Plan are enhancing equity and supporting climate resiliency. To equitably support watershed-based planning, the Plan focuses on two approaches to Environmental Justice (EJ): (1) supporting statewide EJ initiatives through active and inclusive community engagement and (2) enhancing the accessibility of NPS funding and capacity building resources to Massachusetts Tribes and Communities with EJ Populations. To support climate adaptation, the Plan focuses on climate resiliency planning and implementing BMPs with climate-adaptive management strategies.

In this Plan, nonpoint sources in Massachusetts are classified into eleven primary categories, which are further divided into subcategories based on the Assessment, Total Maximum Daily Load Tracking and Implementation System (ATTAINS) tool from the U.S. Environmental Protection Agency (USEPA). MassDEP's Data Management and Water Quality Assessment Section in WPP evaluates the health status of surface waters throughout the Commonwealth, prepares and submits an Integrated List of Waters (Integrated Report) to USEPA with final assessment and listing decisions (i.e., identification of impaired waters), and submits this information to ATTAINS to fulfill reporting requirements under Clean Water Act (CWA) sections 305(b), 303(d), and 314. Therefore, using the ATTAINS categorization system within the NPS Management Plan reflects a coordinated approach within Massachusetts that will help communities to more easily identify NPS impairments for their waterbodies of interest.

Funding through NPS grant programs will be available for all eleven NPS categories, but the three most frequent primary NPS categories associated with impairments in MassDEP's *Final Massachusetts Integrated List of Waters for the Clean Water Act 2022 Reporting Cycl*e (i.e., the 2022 Integrated Report) are focus categories in the NPS Management Plan for the next five years: (1) developed land, (2) septic systems; and (3) agriculture (Figure ES.1). The Plan identifies six NPS Management goals for 2025 to 2029, organized into specific five-year objectives, achievable actions, and measurable milestones. MassDEP's NPS Management Section developed this plan as a capacity building tool itself, sharing knowledge and strategies to simplify complex information and provide guidelines for achieving NPS mitigation.

Successful implementation of this Plan over the next five years will advance Massachusetts's overarching NPS mitigation goals of restoring impaired waters and protecting healthy waters. The new NPS vision, prioritization to enhance equity and climate resiliency, six NPS management goals, and proposed actions to meet the five-year objectives align with the theme of this Plan: *meeting communities where they are*. The coordinated source categorization approach will help communities identify surface waters with NPS impairments, as reported in the Massachusetts Integrated List of Waters, enabling these communities to apply for available NPS funding to restore impaired waters. The focus categories in the Plan will also enhance intra- and inter-agency partnerships to achieve the shared objectives of statewide NPS pollution mitigation from major source categories. Capacity building initiatives to strengthen regional and local partnerships that address equity and climate adaptation needs will further advance NPS management in the Commonwealth through active and inclusive community engagement.

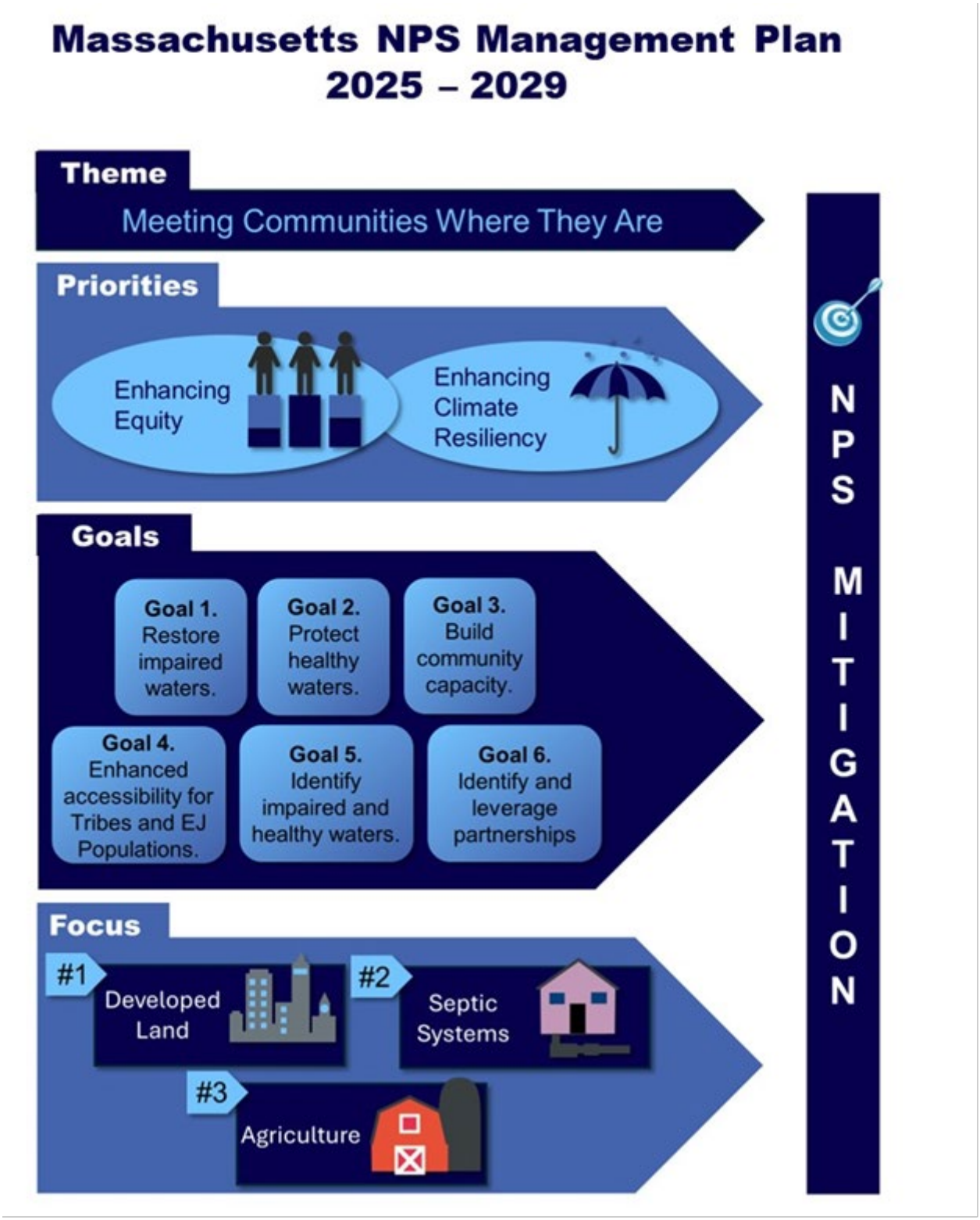


Figure ES.1. *An overall summary of the Massachusetts NPS Management Plan (2025 – 2029).*

NEW TO THE 2025–2029 NPS MANAGEMENT PLAN:

- Massachusetts NPS Vision
- Theme, priorities, and goals
- NPS categorization (source of NPS impairments): eleven NPS primary categories and their subcategories, based on the 2022 Massachusetts Integrated List of Waters
- Three focus categories for 2025-2029: Developed Land, Septic Systems, and Agriculture
- Nitrogen Impacted Coastal Waters: A newly added geographical focus area eligible for NPS funding
- In addition to traditional NPS pollutants (nutrients, pathogens, and sediment), emphasis on chloride, contaminants of emerging concern, and other NPS pollutants.
- Capacity building initiatives: (technical, nontechnical, community-focused)
- Active and Inclusive Community Engagement with an emphasis on youth engagement
- Enhanced accessibility of NPS funding to Massachusetts Tribes and Communities with Environmental Justice (EJ) Populations
- Climate Resiliency Planning and Adaptive Management of Best Management Practices
- More focused partnership with achievable outcomes
- NPS Education Materials

CONTENTS

FIGURES

TABLES

ABBREVIATIONS

6PPD	N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine
6PPDQ	N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine--quinone
9e-WBP	Nine-element Watershed-Based Plan
a-WBP	Alternative Watershed-Based Plan
ACEP	Agricultural Conservation Easement Program
ACRE	Agricultural Climate Resiliency & Efficiency
AEEP	Agricultural Environmental Enhancement Program
ATTAINS	Assessment, Total Maximum Daily Load Tracking and Implementation System
AU	Assessment Unit
BANRT	Best Available Nitrogen Reducing Technology
BIL	Bipartisan Infrastructure Law
BMP	Best Management Practice
BWR	Massachusetts Bureau of Water Resources
CCMP	Comprehensive Conservation and Management Plan
CEC	contaminant of emerging concern
CGP	Construction General Permit
CIG	Conservation Innovation Grants
CMR	Code of Massachusetts Regulations
CNPCP	Massachusetts Coastal Nonpoint Pollution Control Program
CPR	Coastal Pollution Remediation
CSO	Combined Sewer Overflow
CSP	Conservation Stewardship Program
CWA	Clean Water Act
CWMP	Comprehensive Watershed Management Plan
CWNS	Clean Watershed Needs Survey
CWSRF	Massachusetts Clean Water State Revolving Fund
CZARA	Coastal Zone Act Reauthorization Amendments
CZM	Massachusetts Office of Coastal Zone Management
DAC	disadvantaged communities
DCR	Massachusetts Department of Conservation and Recreation
DER	Massachusetts Division of Ecological Restoration
DFG	Massachusetts Department of Fish and Game
DFW	Massachusetts Division of Fisheries and Wildlife
DM/WBE	Disadvantaged Minority and Women-Owned Business Enterprises
DMF	Massachusetts Division of Marine Fisheries
DWNSA	Drinking Water Nitrogen Sensitive Area
DWSRF	Drinking Water State Revolving Fund
E. coli	*Escherichia coli*
EJ	Environmental Justice
EOEEA/EEA	Massachusetts Executive Office of Energy and Environmental Affairs
EQIP	Environmental Quality Incentives Program
FDA	U.S. Food and Drug Administration
FOTG	Field Office Technical Guide

FRCOG	Franklin Regional Council of Governments
FSA	U.S. Farm Service Agency
FVEP	Farm Viability Enhancement Program
GI	green infrastructure
GRTS	Grant Reporting and Tracking System
Hydro GP	Hydroelectric Generating Facilities General Permit
I/A	Innovative and Alternative (septic) systems
ITA	Interbasin Transfer Act
INSPIRE	Ideas for Nonpoint Source Projects: Information, Resources, and Examples
IUP	Intended Use Plans
MACD	Massachusetts Association of Conservation Districts
MassDEP	Massachusetts Department of Environmental Protection
MassGIS	Massachusetts Bureau of Geographic Information
MASSTC	Massachusetts Alternative Septic System Test Center
MDAR	Massachusetts Department of Agricultural Resources
MEP	Massachusetts Estuaries Project
MGL	Massachusetts General Laws
mg/L	milligrams per liter
MET	Massachusetts Environmental Trust
MS4	municipal separate storm sewer system
MVP	Municipal Vulnerability Preparedness Program
MWRA	Massachusetts Water Resources Authority
NEP	National Estuary Program
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	nonpoint source
NPSMP	Nonpoint Source Management Plan
NRCS	Natural Resources Conservation Service
NRD	Natural Resources Damages Program
NRNSA	Natural Resource Nitrogen Sensitive Area
NWQI	National Water Quality Initiative
OECD	Organization for Economic Co-operation and Development
ORW	Outstanding Resource Water
OSG	Sewer Overflow and Stormwater Reuse Municipal Grants Program
OWR	Massachusetts Department of Conservation and Recreation Office of Water Resources
PFAS	per- and polyfluoroalkyl substances
POTW	Publicly Owned Treatment Works
POTW GP	Publicly Owned Treatment Works General Permit
PPA	Performance Partnership Agreement
PPCP	pharmaceuticals and personal care products
PPG	Performance Partnership Grant
PRB	permeable reactive barrier
PWTF GP	Potable Water Treatment Facilities General Permit

QAPP	Quality Assurance Project Plan
RC	Regional Nonpoint Source Coordinators
RCPP	Regional Conservation Partnership Program
RFP	Request for Proposals
RGP	Remediation General Permit
RMAT	ResilientMass Action Team
RMAT Tool	Climate Resilience Design Standards Tool
RPA	regional planning agencies
RPST	Recovery Potential Screening Tool
SERO	Southeast Regional Office (MassDEP)
SNEP	Southeast New England Program
SO_2	sulfur dioxide
SOP	Standard Operating Procedures
SSA	sole source aquifer
SWAP	Source Water Assessment and Protection
SWMI	Sustainable Water Management Initiative
SWQS	Surface Water Quality Standards
TMDL	total maximum daily load
TNC	The Nature Conservancy
TWMP	Targeted Watershed Management Plan
US	United States
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
USNPS	U.S. National Parks Service
WBP	Watershed-Based Plan
WMA	Water management Act
WMP	Watershed Management Plan
WPA	Wetlands Protection Act
WPP	Watershed Planning Program (MassDEP)
WRC	Water Resources Commission

1. INTRODUCTION

Since the passage of the federal Clean Water Act (CWA) in 1972, states have dramatically improved the health of waterbodies throughout the United States, with guidance from the U.S. Environmental Protection Agency (USEPA). The greatest gains have been achieved by developing and implementing technologies to address pollution flowing into waterbodies from fixed or "point" sources, such as industrial discharge outfalls. This is because collection and treatment from point sources, while expensive, is simpler from a technical perspective, more direct, and more measurable than addressing pollution from diffuse or "nonpoint" sources (NPS). As a result of strides made to mitigate point sources, NPS pollution has become the leading cause of water quality impairment in the United States.

NPS pollution can occur anywhere and is typically most prevalent in areas where land development—ranging from cities to suburban backyards to farm fields—has altered local hydrology and increased the amounts of pollutants that can be carried into waterbodies by stormwater runoff. Climate change has exacerbated the challenges faced by states' efforts to manage stormwater runoff. Increased storm frequency and intensity have resulted in increased pollutant runoff, flooding, and erosion. NPS pollution and climate change impacts can disproportionately affect Communities with Environmental Justice Populations. The management of NPS pollution in Massachusetts is a statewide challenge requiring a cooperative effort involving federal and state government agencies, Tribes, private organizations, and the public.

Figure 1.1. *Stormwater flowing from a suburban road into a catch basin can convey a wide variety of NPS pollutants. Photo: MassDEP.*

Congress has tasked USEPA to oversee a planning framework that must be implemented by each state to address NPS pollution. In Massachusetts, the Department of Environmental Protection (MassDEP), through the Watershed Planning Program in the Bureau of Water Resources, prepares and publishes the Massachusetts Nonpoint Source Management Program Plan (NPS Management Plan) to provide information on the statewide strategy for preventing, controlling, and reducing NPS pollution to protect and improve the quality of the Commonwealth's waters. This Plan describes the Massachusetts Nonpoint Source Management Program as required in s.319 of the Clean Water Act and EPA's Nonpoint Source Program and Grants Guidelines for States and Territories (USEPA, 2024).

The Massachusetts NPS Management Plan was first developed in 1989 and approved by USEPA, pursuant to Section 319(b) of the CWA (CWA s.319(b)), and was subsequently revised in 1994, 1999, 2014, and 2019. The NPS Management Plan (2020-2024) was also revised in 2023 to include the development and implementation of CWA s.208 Area Wide Waste Treatment Management Plans and other regional-scale watershed planning documents for Nitrogen Impacted Coastal Waters. The NPS Management Plan (2025-2029) has been updated to reflect the current goals and priorities of the NPS Management Section in MassDEP's Watershed Planning Program, in conformance with current USEPA program guidelines.

Figure 1.2. *Ice forms on a tributary to the Blackstone River. Photo: MassDEP.*

1.1 NPS MANAGEMENT PLAN PURPOSE AND PRIORITIES

The purpose of the Massachusetts NPS Management Plan (2025-2029) is to:

- Communicate MassDEP's strategy to use grant programs to address the causes and impacts of NPS pollution in Massachusetts,
- Identify priorities and long-term goals for protecting and restoring waters and watersheds from NPS pollution, and
- Establish a five-year road map of specific, short-term objectives and measurable milestones to guide work toward attaining long-term NPS management goals.

This NPS Management Plan identifies overarching priorities and specific measurable actions to reduce the impacts of NPS pollution from three primary NPS categories (developed land, septic systems, and agriculture), protect healthy waters, advance climate resiliency through NPS solutions, and ensure equitable access to the benefits of the proposed actions of this Plan. MassDEP will coordinate with multiple partners, such as governmental agencies, local watershed stewards, and the private sector to achieve the objectives of NPS Management Plan, as identified in the list below.

- Restore impaired waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.

- Protect healthy waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.
- Build the capacity of communities to mitigate NPS pollution through active and inclusive engagement, outreach, and education.
- Enhance NPS pollution mitigation for Tribes and Communities with Environmental Justice (EJ) Populations.
- Identify NPS-impaired and healthy waters through water quality monitoring and assessment and develop restoration plans.
- Identify and leverage work by federal, state, local and private partners.

1.2 KEY UPDATES

The Massachusetts NPS Management Plan (2025-2029) includes several updates to the 2020-2024 version and reflects recent modifications to surface and groundwater management strategies within MassDEP to address NPS pollution. The Plan incorporates actions to address new NPS management challenges such as the impacts of climate change and contaminants of emerging concern (CECs). Finally, the updated Massachusetts NPS Management Plan prioritizes the integration of equity into NPS grant programs to ensure that under-represented and overburdened populations have equitable access to the benefits of the actions or recommendations of the NPS Management Plan. Together, the inclusion of these new elements strengthens the Plan, makes it more responsive to the needs of the residents of the Commonwealth, and positions MassDEP to respond more effectively to NPS challenges over the next five years and into the future.

Key NPS management framework updates include the items listed below.

(1) Promulgation of amendments to the Massachusetts Surface Water Quality Standards (314 CMR 4.00) in 2021.
(2) Development of draft Statewide Total Maximum Daily Loads for pathogen-impaired waters.
(3) Development of Total Maximum Daily Loads for nitrogen-impaired estuarine and embayment systems.
(4) Coordination with the MassDEP Wastewater Program to support projects in Nitrogen Impacted Coastal Waters.
(5) Advancement of climate resiliency in MassDEP programs to ensure the impacts of climate change (more frequent and longer droughts, water supply shortages, wildfires, frequent and more intense storms, flooding, and sea-level rise) are addressed and mitigated.

(6) Incorporation of equitable access to the benefits of the NPS Management Plan administered by the NPS Management Section in MassDEP's Watershed Planning Program.

(7) Coordination with MassDEP's Clean Water State Revolving Fund (CWSRF) Program to implement NPS Management Section initiatives.

1.3 NPS MANAGEMENT PLAN ADMINISTRATION

MassDEP is the agency designated to administer CWA programs for the Commonwealth of Massachusetts. Within MassDEP, the NPS Management Section in the Watershed Planning Program (WPP), Bureau of Water Resources (BWR), develops and implements the Massachusetts NPS Management Plan. WPP is comprised of five Sections (Figure 1.3), each of which has a different technical focus under the federal CWA. All Sections are linked under the CWA; the actions of each Section are based on data, and all Sections participate in an iterative process to continually monitor, assess, and protect or restore water quality.

Figure 1.3. *Each of the five Sections in the Watershed Planning Program at MassDEP has a different technical focus but functions interdependently to achieve the goals of the CWA. NPS management is non-regulatory. The work of WPP informs compliance actions by other MassDEP programs.*

2. NPS MANAGEMENT PLAN OVERVIEW

2.1 MISSION/VISION

MassDEP Mission Statement:

The mission of the Massachusetts Department of Environmental Protection (MassDEP) is to protect and enhance the Commonwealth's natural resources – air, water, and land – to provide for the health, safety, and welfare of all people, and to ensure a clean and safe environment for future generations. In carrying out this mission MassDEP commits to address and advance environmental justice and equity for all people of the Commonwealth, to provide meaningful, inclusive opportunities for people to participate in agency decisions that affect their lives; and to ensure a diverse workforce that reflects the communities we serve.

Watershed Planning Program Mission Statement:

The mission of the Watershed Planning Program (WPP) in the Massachusetts Department of Environmental Protection is to protect, enhance, and restore the quality and value of the waters of the Commonwealth. Guided by the federal Clean Water Act, WPP implements this mission statewide through five Sections that each have a different technical focus: (1) Surface Water Quality Standards; (2) Surface Water Quality Monitoring; (3) Data Management and Water Quality Assessment; (4) Total Maximum Daily Load; and (5) Nonpoint Source Management. Together with other state environmental agencies, WPP shares in the duty and responsibility to secure the environmental, recreational, and public health benefits of clean water for all people of the Commonwealth.

Massachusetts Nonpoint Source Management Vision:

The vision of the Massachusetts Nonpoint Source Management Section in the Watershed Planning Program is to equitably support watershed-based planning and the implementation of climate-resilient best management practices statewide, including nature-based solutions, to restore impaired waters and protect healthy waters through active and inclusive community engagement.

The NPS Management Vision Statement will direct and prioritize the work of the NPS Management Section over the next five years and guide the NPS Management Section towards accomplishing the broader Mission Statement of MassDEP. Progress toward meeting this vision will be important, not only for building the capacity of the NPS grant programs but also for celebrating successes.

Through the NPS Management Vision Statement, the NPS Management Section will strive to achieve the goals of this Plan and to ensure that disadvantaged communities that have been disproportionately burdened by water quality pollution are able to access the benefits of the NPS Management Plan and other programs statewide.

2.2 CLEAN WATER ACT (CWA) GRANT PROGRAMS

MassDEP's NPS Management Section in the Watershed Planning Program administers two grant programs funded by the Environmental Protection Agency under the Clean Water Act , the CWA s.604(b) Water Quality Management Planning Grant and the CWA s.319 NPS Implementation Grant. The NPS Management Section integrates the two grant programs to create a seamless planning-to-implementation pipeline to attain the goals of the NPS Management Plan.

2.2.1 CWA s.604(b) Water Quality Management Planning Grant Program

CWA s.604(b) provides funds to states to carry out planning under CWA s.205(j) and s.303(e). Under CWA s.205(j), grants are awarded to states to conduct water quality management planning, and states are required to allocate at least 40% of the grant amount to provide water quality assessment and planning assistance to local communities. CWA s.303(e) calls for a continuing planning process for all navigable waters in the state. Annual allocations are calculated based on 1% of a state's Clean Water State Revolving Fund allotment.

MassDEP uses CWA s.604(b) funds to support statewide water quality planning activities under CWA s.205(j) and s.303(e). Pass-through 604(b) water quality management planning grants fund projects to identify NPS water quality issues, determine the most effective solutions, and provide preliminary designs for best management practices (BMPs) to address the identified issues. Pass-through CWA s.604(b) grant funds are also used to conduct watershed-based planning, such as the development of watershed-based plans (WBPs) nine-element WBPs (9e-WBPs) and alternative WBPs (a-WBPs) – and update of Comprehensive Wastewater Management Plans and Targeted Watershed Management Plans to 9e-WBPs.

The Bipartisan Infrastructure Law (BIL) provides supplemental funds for federal fiscal years 2022 through 2026 under CWA s.604(b) to states to conduct water quality management planning with a focus on addressing equity and climate challenges. BIL funding is subject to the same requirements as base CWA s.604(b) funding. USEPA issued the *Interim Implementation Guidelines for Clean Water Act Section 604(b) Water Quality Management Planning Grants for Fiscal Years 2022 through 2026*, on June 29, 2022 (BIL Guidelines).

Each year, MassDEP releases a Request for Proposals (RFP) for competitive grant projects. Pursuant to CWA s.604(b), eligible grant applicants must be either Regional Public Comprehensive Planning Organizations or Interstate Organizations. MassDEP has defined these to include regional planning agencies, councils of government, counties, conservation districts, cities and towns, other sub-state public planning agencies, interstate agencies, and tribes. MassDEP encourages applicants to propose water quality management planning projects that will lead to direct actions to implement water quality improvements and/or protect existing water quality. Applicants are not required to provide match; however, including match may increase the competitiveness of a proposal. MassDEP provides updated information in advance of each grant round, including priority project types and how to develop a competitive application, by hosting a pre-RFP informational meeting, and most recently through the annual NPS Management Forum. Potential grant applicants are strongly encouraged to contact MassDEP's NPS Management Section staff to discuss their ideas before proposal development.

Pass-through funding for watershed-based NPS assessment projects, with a specific focus on one or more of the following project categories listed below, will be prioritized over the next five years.

1. Projects that determine the nature, extent, and cause(s) of water quality problems and determine pollutant load reductions necessary to meet applicable criteria established in the Massachusetts Surface Water Quality Standards (SWQS).
2. Projects that develop climate resilient designs and implementation plans to address water quality issues.
3. Projects that develop 9e-WBPs or a-WBPs for impaired and healthy waters, respectively.
4. Projects that advance climate change adaptation and resiliency through the development of resilient designs and implementation plans that will address water quality impairments.
5. Projects that ensure equitable access to the benefits of CWA s.604(b) funds.
6. Projects that aim to reduce nutrient pollution through regional scale watershed-based planning to restore impaired waters and Nitrogen Impacted Coastal Waters (Cape Cod, Martha's Vineyard, Nantucket, and Plymouth and Bristol counties).

Annual priorities are determined by departmental or partner activities and programmatic targets.

2.2.2 CWA s.319 NPS Implementation Grant Program

The United States Congress appropriates funds under Section CWA s.319 (33 U.S.C.A., Sc. 1251 et seq.) on an annual basis to assist states in implementing their approved NPS programs. USEPA administers CWA s.319, overseeing the awards to individual states and providing program oversight. The NPS Management Section in MassDEP's Watershed Planning Program administers this award.

The CWA s.319 grant program focuses on the implementation of activities and projects for the control of NPS pollution. MassDEP provides financial support in the form of pass-through grants for projects to manage NPS pollution in compliance with applicable criteria established in the Massachusetts SWQS.

Each year, states must use at least 50% of their annual CWA s.319 allocation (referred to as 319 Watershed Project Funds) to support projects that will implement approved 9e-WBPs or alternative watershed plans to restore and protect NPS-impacted waters or protect healthy waters. CWA s.208 Plans or other existing watershed plans that meet requirements for 9e-WBPs for impaired waters or alternative plans for healthy waters are acceptable. CWA s.319 Watershed Projects are designed to implement measures that address the prevention, control, or abatement of NPS pollution, and result in the restoration or protection of beneficial uses in compliance with the Massachusetts SWQS. NPS project priorities include addressing climate change and advancing climate resiliency through green infrastructure and nature-based solutions, and incorporating active and inclusive community engagement to ensure under-represented populations, which may be overburdened by NPS impacts, are equitably represented. States may use up to 50% of their total CWA s.319 allocation (NPS program funds) on eligible program management and/or plan development activities that support the goals of the state's approved NPS Management Plan Within this category, projects may include capacity building and technology transfer.

MassDEP releases RFPs for CWA s.319 grant projects. MassDEP encourages eligible applicants to propose watershed implementation projects that will lead to the restoration of impaired waters or the protection of healthy waters. State NPS Management guidelines and priorities for CWA s.319 grant funding may change from year to year. Potential grant applicants are strongly encouraged to contact NPS Management Section staff in MassDEP's Watershed Planning Program to discuss their ideas before proposal development.

The project categories listed below will be prioritized over the next five years.

(1) Projects that implement management measures that advance climate change adaptation and resiliency to improve impaired waters or protect healthy waters.

(2) Projects that build capacity to ensure equitable access to the benefits of CWA s.319 funds to Communities with Environmental Justice Populations and State and Federally Recognized Tribes.

(3) Projects that reduce nutrient pollution through regional scale watershed planning and implementation for the restoration of Nitrogen Impacted Coastal Waters (Cape Cod, Martha's Vineyard, Nantucket, and Plymouth and Bristol counties).

2.3 NPS ROADMAP

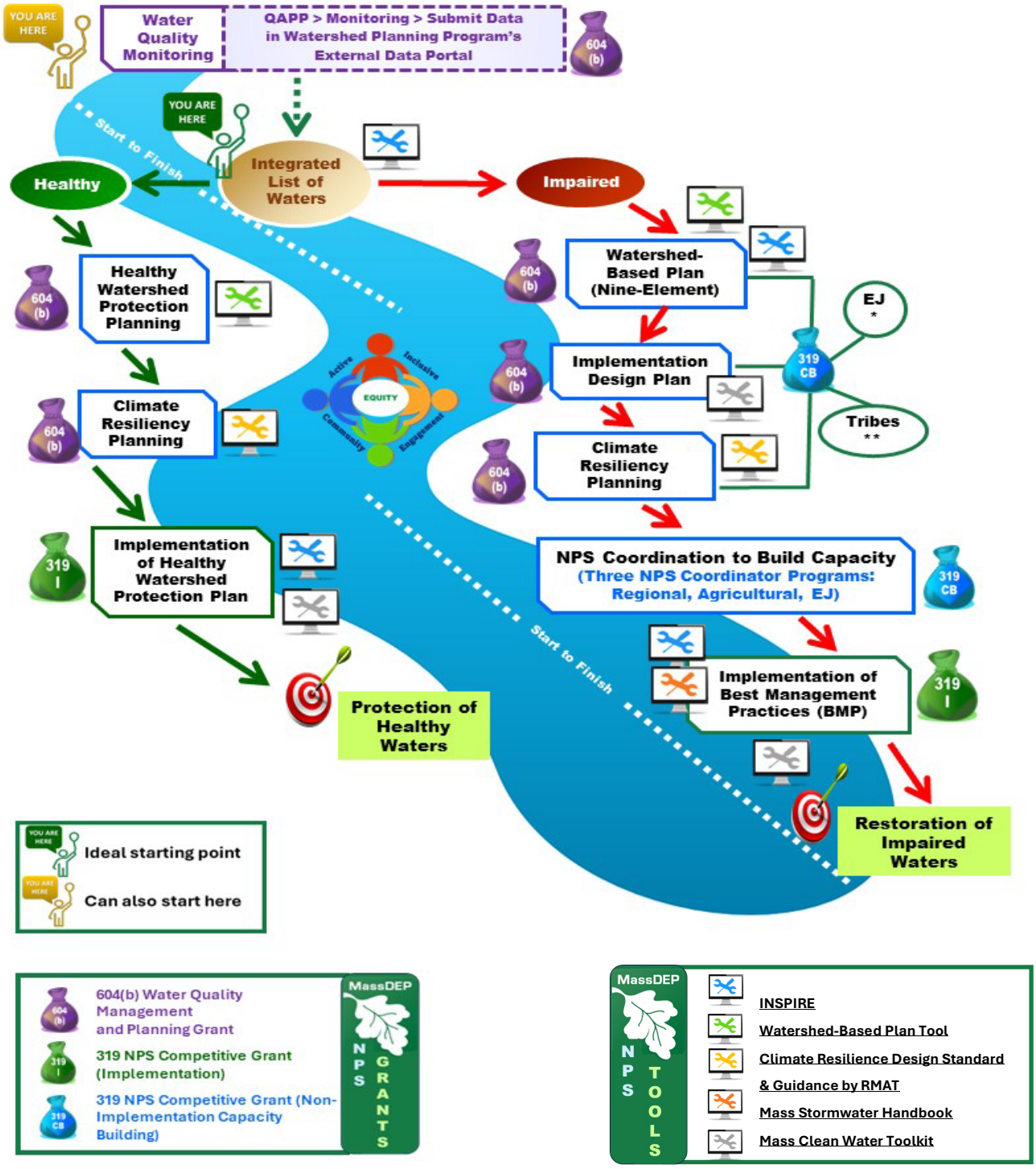


Figure 2.1. *This NPS Roadmap depicts the paths that Massachusetts communities of any capacity can follow to start the abatement of NPS pollution from their waterbodies. Funding is subject to availability of federal funds, NPS grants workplan, and approval of grant proposals.*

A core tenet of the Massachusetts NPS Management Plan is *to meet communities where they are*. The NPS Management Section has developed an NPS Roadmap (Figure 2.1) to assist communities with navigating the NPS grant programs, regardless of where they are in the NPS management process. This illustration shows that communities can achieve financial support and access supporting tools at every step of their journey in restoring impaired waters and protecting healthy waters.

2.4 MASSACHUSETTS NPS MANAGEMENT PLAN (2025-2029): GOALS

The Massachusetts NPS Management Plan (2025-2029) is designed to provide a five-year road map to achieve MassDEP's NPS vision to equitably support watershed-based planning and the implementation of climate-resilient best management practices, including nature-based solutions to restore impaired waters and protect healthy waters through active and inclusive community engagement by achieving six specific goals. These goals are built on existing and new initiatives and reflect a focused state NPS Management strategy designed to achieve and maintain compliance with the Massachusetts SWQS by maximizing the beneficial uses of the Commonwealth's water resources. Enhancing equity and climate resiliency are prime objectives of the strategy. The NPS Management Section in the Watershed Planning Program will partner with a variety of federal, state, and local programs to achieve these goals, while striving for equitable access to NPS funding and meeting climate adaptation guidelines for NPS solutions. This section provides an overview of MassDEP's goals to restore and protect the waters of the Commonwealth consistent with the NPS Management vision to address NPS pollution, *meeting communities where they are*.

Figure 2.2. *MassDEP has identified six goals to achieve the NPS Management vision.*

Goal 1. Restore impaired waters through watershed-based planning and implementation of climate-resilient BMPs to reduce NPS pollutants.

The restoration of impaired waters in the Commonwealth continues to be the primary focus of the NPS Management Plan. Many actions at the local, state, and federal levels in recent years have improved water quality in the state, but work remains as new challenges related to emerging contaminants and climate change arise. MassDEP will support the development of WBPs for impaired waters. Watershed-based planning and the implementation of on-the-ground actions, such as the installation of climate-resilient BMPs in the watersheds of impaired waters identified in the USEPA-approved Massachusetts Integrated List of Waters, in Communities with Environmental Justice populations, and in Nitrogen Impacted Coastal Waters, are priorities of the NPS Management Plan.

Figure 2.3. *Goal 1 and objectives of the Massachusetts NPS Management Plan.*

Goal 2. Protect healthy waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.

In support of USEPA's Healthy Waters Program, and pursuant to federal NPS program guidelines, the protection of priority resources and high-quality waters is a goal of this NPS Management Plan. To achieve this component of the Plan, new approaches and programs to promote and assist with the development of WBPs will be created to protect healthy waters. MassDEP will undertake efforts to understand and mitigate NPS pollution to both protect healthy waters and address the effects of climate change. To achieve this goal, MassDEP will engage local partners on climate change adaptation, resiliency planning, and protection of healthy waters. Work accomplished in the next five years will be crucial to laying the foundations for future programs, allocating resources, and conducting research needed to better target protection activities for maximum results. As with all goals in this NPS Management Plan, this work must be undertaken with an understanding of how human activities impact the natural environment and the implications of the changing climate on NPS pollution while ensuring equitable and fair access to environmental program benefits.

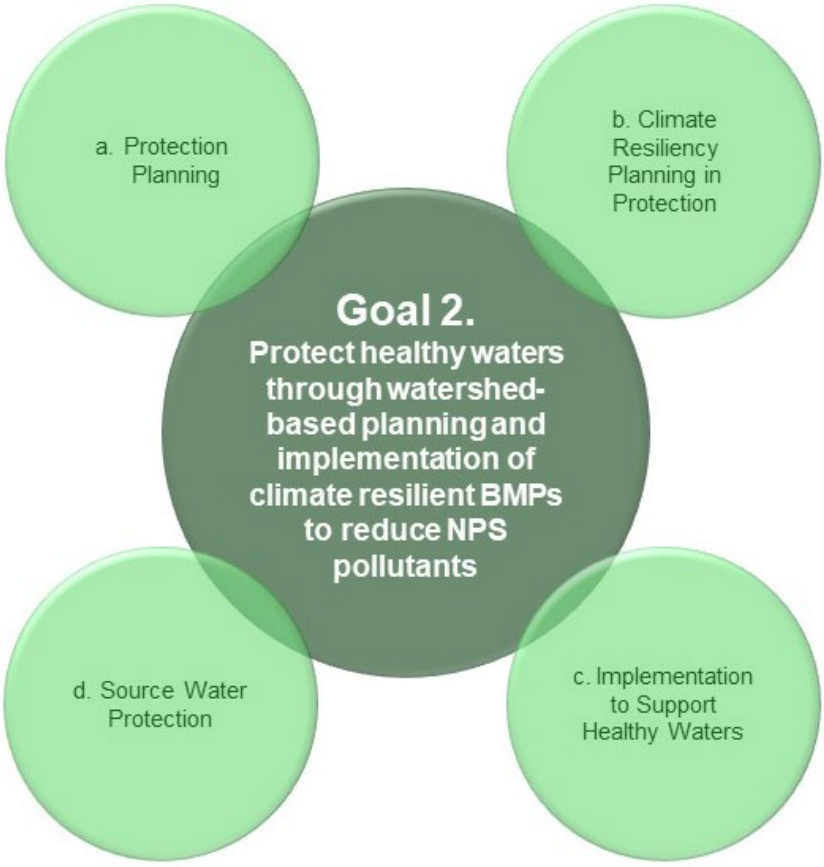


Figure 2.4. *Goal 2 and objectives of the Massachusetts NPS Management Plan.*

Goal 3. Build the capacity of communities to mitigate NPS pollution through active and inclusive engagement, outreach, and education.

Capacity building is a key goal to support and enhance the technical, managerial, and financial abilities of relevant parties to effectively and efficiently address issues related to NPS pollution. Sustainable watershed partnerships that include all residents, private and public entities, and government agencies, each with their own strengths and resources, can provide the long-term interest and focus needed for effective, local watershed management. MassDEP's NPS Management Section has started building such partnerships through the Regional NPS Coordinators program, the Regional Agricultural NPS Coordinators program, and the recently launched Environmental Justice NPS Coordinators program (see Section 4, Goal 3 for more information about Regional Coordinator). MassDEP plans to initiate additional steps toward statewide implementation of these pilot initiatives to achieve the vision of this Plan by building new partnerships with a solid foundation of knowledge, communication, and equitable access to information and resources. MassDEP also recognizes that building technical capacity, education, and training plays a critical role in addressing NPS pollution in the state. To enhance technical support to communities, MassDEP's NPS Management Section will continue to maintain and update Massachusetts' NPS tools, such as the INSPIRE (Ideas for Nonpoint Source Projects: Information, Resources, & Examples) Capacity Building Tool, the WBP Tool, and the Clean Water Toolkit (see Section 4 for additional information regarding these tools).

NPS Regional Coordinators

The NPS Management Section funds regional organizations to conduct NPS planning and implementation activities such as the identification of regional NPS priorities, development of WBPs, outreach and education, and the development and submittal of CWA s.319 projects proposals to build local capacity and restore impaired waters and protect healthy waters.

***Regional NPS Coordinators** are contracted Regional Planning Agencies (RPA) and other eligible regional-scale not-for-profit entities who conduct NPS-focused work supporting the Massachusetts NPS Management Plan.*

***Regional Agricultural NPS Coordinators** carry out agriculture related NPS-focused work, that will further the goals of the Massachusetts NPS Management Plan.*

***Environmental Justice NPS Coordinators** are RPAs and local community-based organizations which engage with and/or form partnerships to benefit Massachusetts' EJ communities and other eligible not-for-profit entities for capacity-building work amongst DACs to ensure equitable and fair access to the benefits of the actions of the Massachusetts NPS Management Plan.*

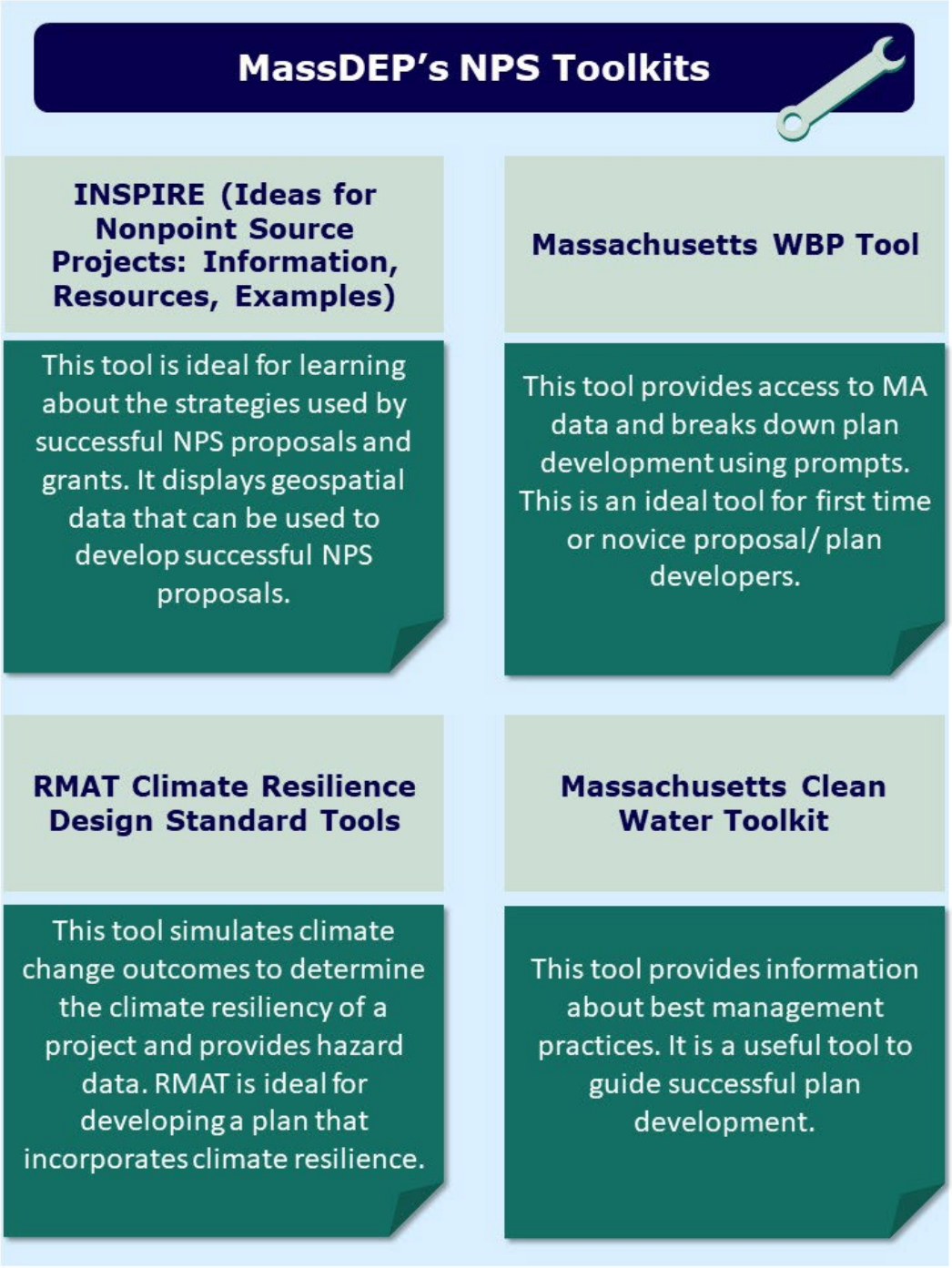


Figure 2.5. *MassDEP's NPS Toolkits: An overview.*

In addition, the NPS Management Section plans to build an NPS-specific user guide for the ResilientMass Action Team (RMAT) Climate Resilience Design Standards Tool to help communities conduct climate risk assessments and adaptation planning for BMPs. Along with user guides in text, training videos will also be developed to assist with these tools. MassDEP will develop a guidance document to integrate active and inclusive community engagement in all NPS projects from start to finish. MassDEP's NPS Management Section will also investigate the feasibility of establishing two training programs: i) WBP development and ii) NPS green infrastructure community champions (see Section 4 for additional information).

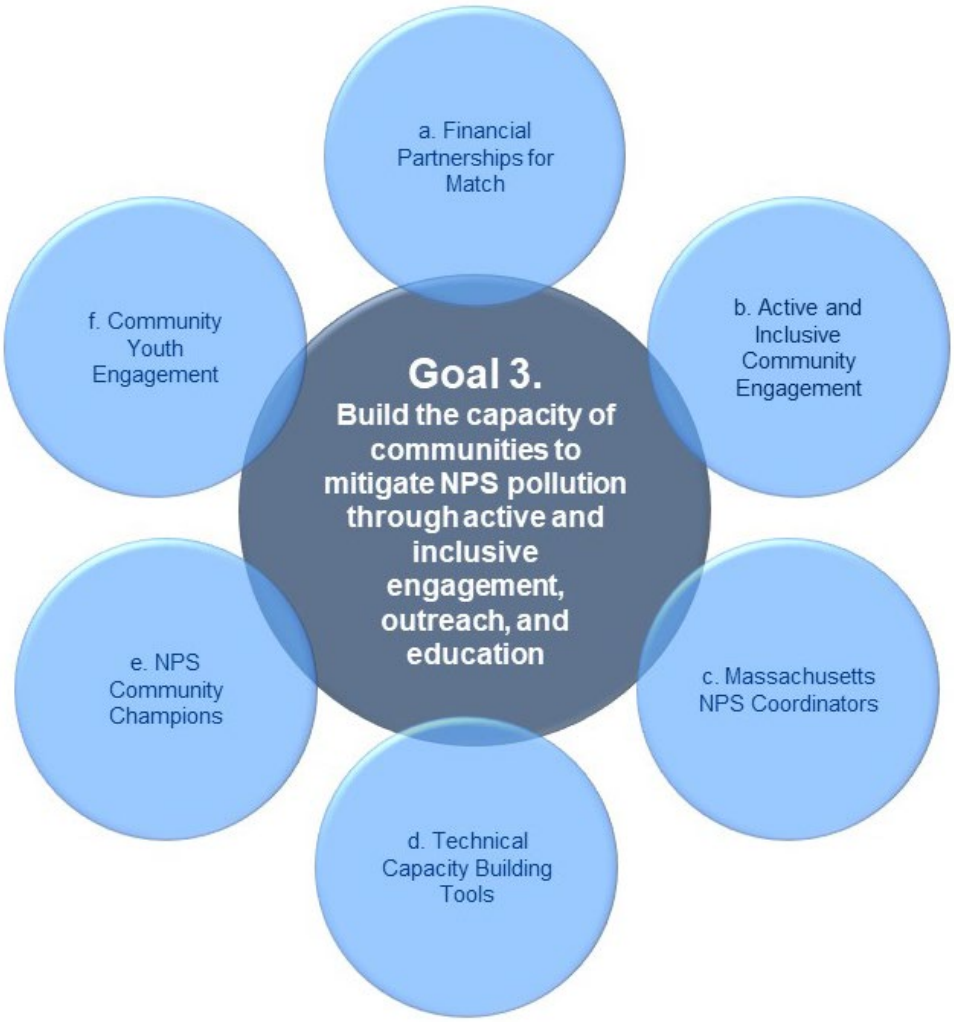


Figure 2.6. *Goal 3 and objectives of the Massachusetts NPS Management Plan.*

Goal 4. Enhance NPS pollution mitigation for Tribes and Communities with Environmental Justice Populations.

A goal of MassDEP is to enhance equity for all people of the Commonwealth, ensuring all communities have access to NPS grant program benefits and reducing equity barriers for EJ Populations and State and Federally Recognized Tribes. All capacity-building initiatives mentioned in Goal 3 will be prioritized in these communities. MassDEP's NPS Management Section has conducted a community needs survey, targeted to collect information at the regional level, to understand how equity barriers and needs have been perceived and the variability across Regional Planning Areas of Massachusetts. This pilot initiative will be extended to identify equity barriers and needs at the local level through community-specific equity needs assessments conducted by the Environmental Justice NPS Coordinators program. MassDEP's NPS Management Section plans to conduct targeted outreach to Tribes and Communities with EJ populations about the new flexibilities to enhance equitable access to NPS funding.

Figure 2.7. *Goal 4 and objectives of the Massachusetts NPS Management Plan.*

Goal 5. Identify NPS-impaired and healthy waters through water quality monitoring and assessment, and develop restoration or protection plans (including TMDLs).

Statewide watershed planning is conducted by the MassDEP Watershed Planning Program (WPP), guided by CWA s.303. Each WPP Section has a different technical focus under the CWA, with the overarching goal to protect, enhance, and restore the quality and value of the waters of the Commonwealth. MassDEP will continue developing new and/or revised surface water quality criteria, including criteria for nutrients and emerging contaminants, and review USEPA's final Tribal Reserved Rights and Baseline Water Quality Standards rule to refine human health criteria, as necessary. MassDEP will conduct deterministic (targeted) and probabilistic (random) sampling to support water resources management, prioritizing sampling in Communities with EJ Populations. Probabilistic sampling will increase data collection in unassessed waters, including those in Communities with EJ Populations. MassDEP will collect chloride baseline data and conduct statewide water quality assessments to expand the identification of both healthy and impaired waters, including waters impaired due to NPS pollution. MassDEP will also develop and implement total maximum daily loads (TMDLs) for nutrient-, pathogen-, and chloride-impaired waters.

Figure 2.8. *Goal 5 and objectives of the Massachusetts NPS Management Plan.*

Goal 6. Identify and leverage work by state, federal, local, and private partners.

In the Commonwealth of Massachusetts, NPS pollution is managed by a variety of federal, state, regional, and local organizations. The cultivation of partnerships with these organizations is key to NPS management. Partners can pool resources, set mutual priorities, and build on each other's actions to overcome resource, policy, or geographic limitations of any partner program. Strong, effective partnerships will enhance the implementation of this NPS Management Plan. MassDEP will increase communication to coordinate efforts among key partners, set watershed priorities, and strive to ensure all partners are equitably represented. MassDEP will seek to align with partner grant programs to maximize environmental benefits and prioritize NPS projects in geographic focal areas and collaborate to support watershed-wide planning and implementation projects in Nitrogen Impacted Coastal Waters. MassDEP will strengthen partnerships with state and federal agricultural programs to support the National Water Quality Initiative (NWQI) Program and NPS projects to protect and restore drinking water source protection areas.

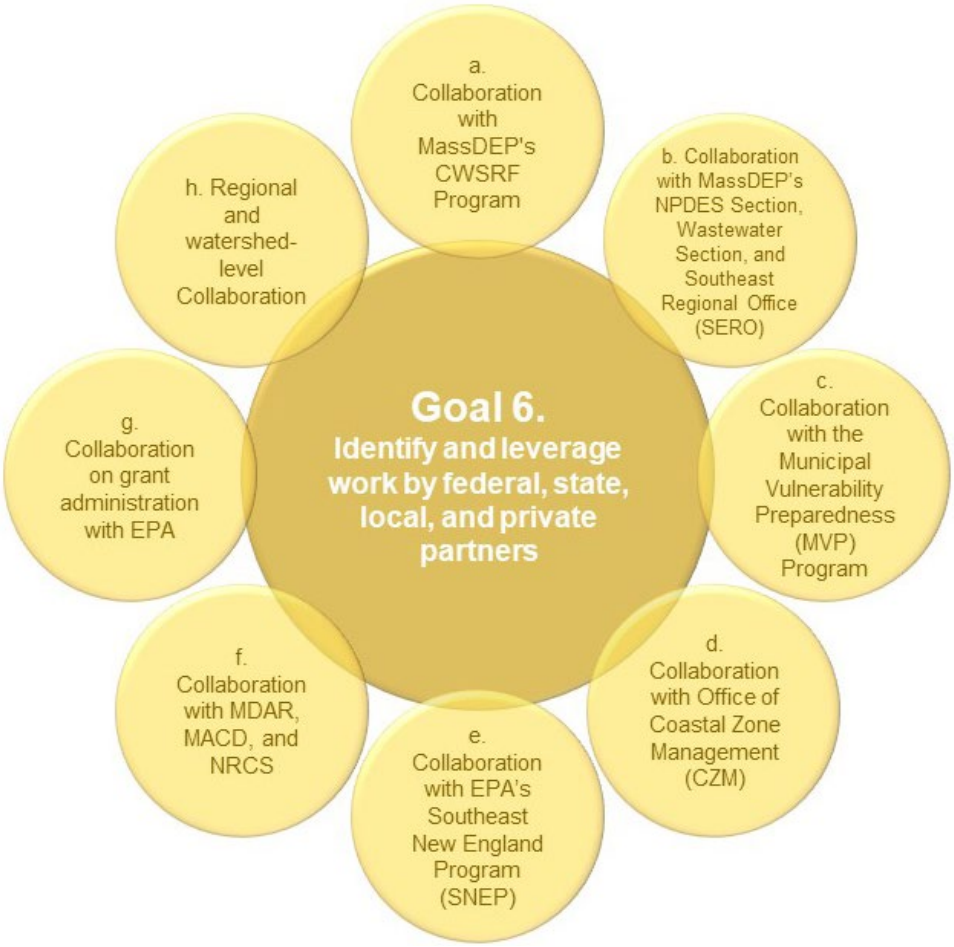


Figure 2.9. *Goal 6 and objectives of the Massachusetts NPS Management Plan.*

2.5 USEPA REQUIRED COMPONENTS

The USEPA *Nonpoint Source Program and Grants Guidelines for States and Territories*, dated May 4, 2024, provides guidelines to states, territories, and the District of Columbia for the implementation of NPS management programs. Table 2.1 identifies the location of USEPA-required components in this NPS Management Plan.

Table 2.1. *Location of USEPA-required NPS program components in the Massachusetts 2025-2029 NPS Management Plan.*

USEPA NPS Program Components	NPS Management Plan	
	Section	**Pages**
1. Identify water restoration and protection goals and program strategies (regulatory, nonregulatory, financial and technical assistance, as needed) to achieve and maintain water quality standards. Include relevant, current, and trackable annual milestones for program implementation.	Section 2 Section 4	Pgs. 13-22 Pgs. 97-194
2. Identify the primary categories and subcategories of NPS pollution and a process for prioritizing impaired and unimpaired waters and identify how national and state priorities may align.	Section 3 Section 4	Pgs. 48-66 Pgs. 93-95
3. Identify management measures (i.e., systems of practices) that will be undertaken to reduce pollutant loadings resulting from each category, subcategory, or particular nonpoint source identified in component 2 above. The measures should also consider the impact of the BMP on groundwater quality.	Section 4	Pgs. 97-194
4. Use both watershed projects and well-integrated regional or statewide programs to restore and protect waters, achieve water quality benefits, and advance any relevant climate resiliency goals.	Section 4	Pgs. 97-138
5. Identify and enhance collaboration with appropriate federal, state, interstate, Tribal, and regional agencies as well as local entities (including conservation districts, private sector groups, utilities, and citizens groups) that will be utilized to implement the state program. Furthermore, support capacity-building in disadvantaged, underserved, or overburdened communities.	Section 4 Appendix A	Pgs. 139-194 Pgs. 219-236
6. Show how the state manages and implements its NPSMP efficiently and effectively, including necessary financial management.	Section 4 Section 5	Pgs. 190-194 Pgs. 206-211
7. Evaluate the state's NPSMP using environmental and functional measures of success and revise its NPSMP plan at least every five years.	Section 4 Section 5	Pgs. 158-165 Pgs. 211-213

3. PRIMARY CATEGORIES AND SUBCATEGORIES OF NPS POLLUTANTS

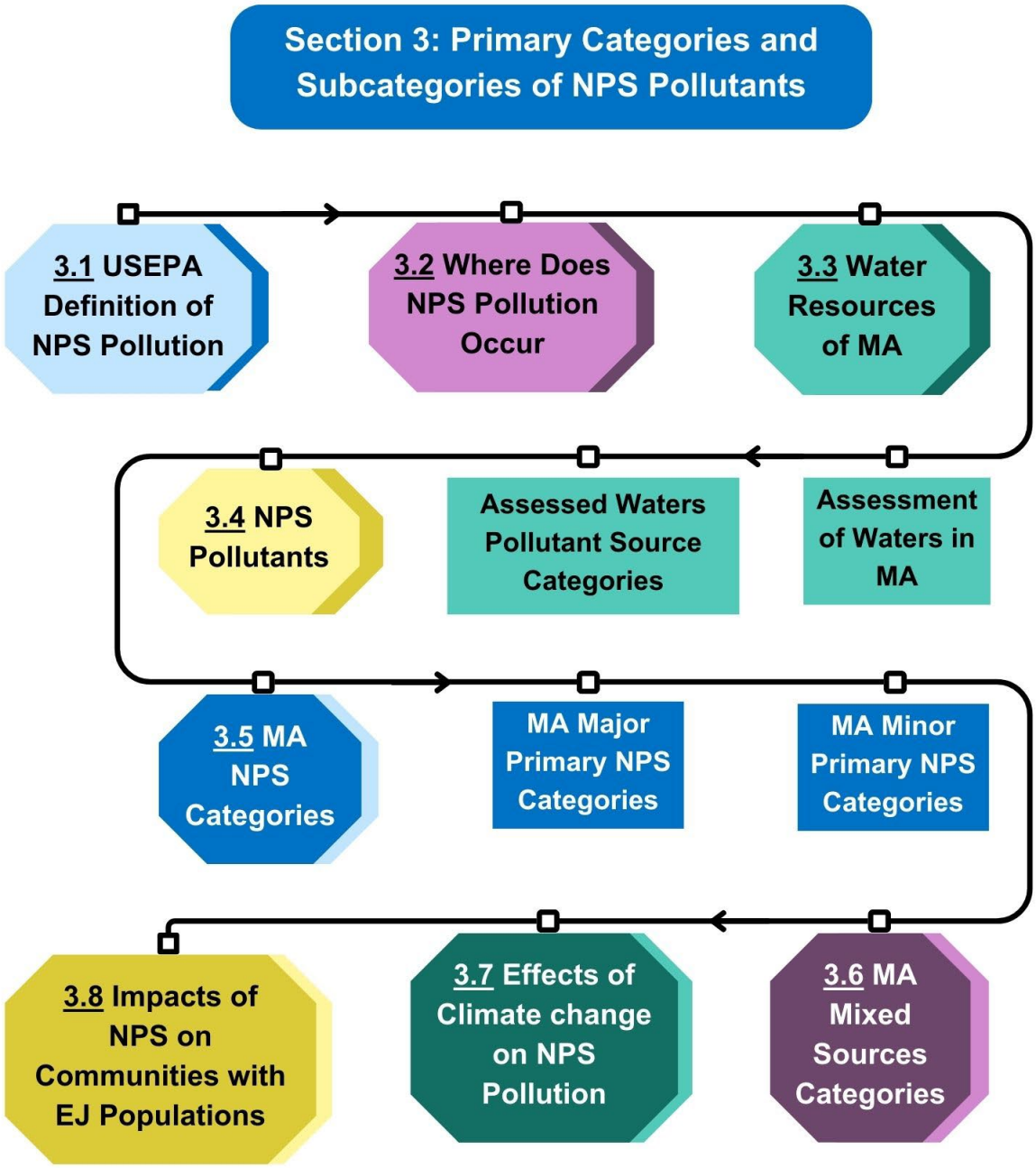


Figure 3.1. *Flowchart displaying the subsections of Section 3.*

3.1 DEFINITION OF NONPOINT SOURCE POLLUTION

USEPA provides the following definition of NPS pollution:

> ***Nonpoint source pollution*** *generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification. The term "nonpoint source" is defined to mean any source of water pollution that does not meet the legal definition of "point source" in Section 502(14) of the Clean Water Act. That definition states:*
>
> > *The term "point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.*
>
> *Unlike pollution from industrial and sewage treatment plants, NPS pollution comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground that ultimately transports natural and anthropogenic pollutants to lakes, rivers, wetlands, coastal waters, and groundwater.*

As the definition states, the movement of water “over and through the ground” is a primary means by which water can become polluted by diverse sources that are found across the Massachusetts landscape. Examples of common NPS pollutants and associated sources are listed below.

- Bacteria (and other pathogens) and nutrients from livestock, pet wastes, and faulty septic systems.
- Sediment from improperly managed construction sites, crop and forest lands, eroding streambanks, and hydromodification.
- Salt from winter road maintenance, water softener systems, irrigation practices, and acid drainage from abandoned mines
- Emerging contaminants such as per- and polyfluoroalkyl substances (PFAS), pharmaceuticals and personal care products from household use;
- Oil, grease, toxic chemicals, and metals from urban runoff, transportation systems, waste disposal, and energy production;

- Excess fertilizers, herbicides, and insecticides from residential areas and agricultural lands;
- Atmospheric deposition of various pollutants including nitrogen, mercury, airborne organic contaminants, and other particulate matter; and
- Thermal pollution due to runoff from impervious surfaces.

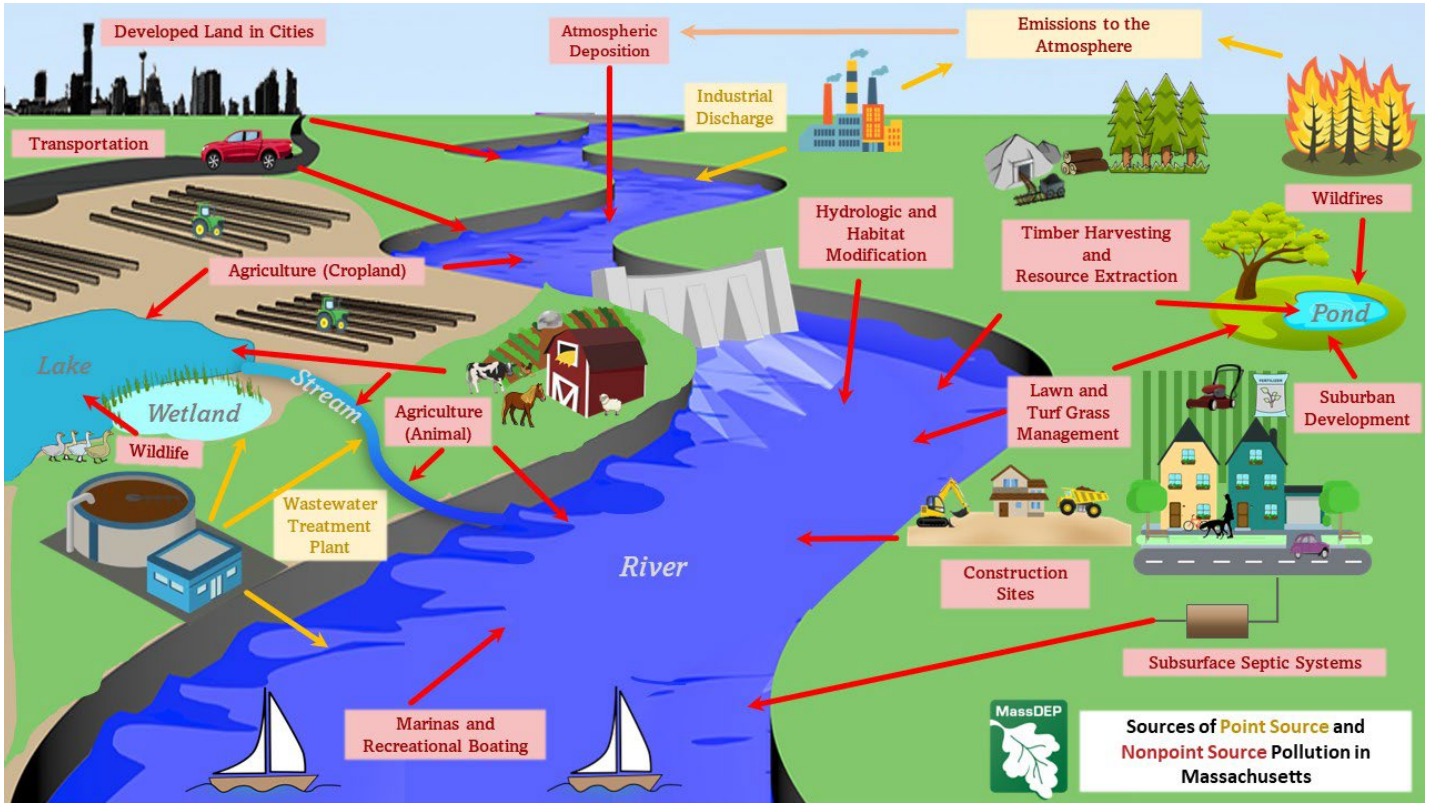


Figure 3.2. *Point and nonpoint source pollution in Massachusetts.*

3.2 WHERE DOES NPS POLLUTION OCCUR?

NPS pollution can occur anywhere. NPS pollutants can be found in stormwater runoff entering lakes in Berkshire County and water flowing off the land in cities and towns in central Massachusetts, and can contribute to shellfish bed closures in coastal areas in coastal areas. However, the prevalence of certain NPS pollutants and their degree of impact on receiving waters is often strongly correlated with specific land uses and the density of land development. For example, NPS pollutants associated with pet waste (i.e., bacteria and nutrients) will generally be more prevalent in densely populated areas that have more pets. In addition to often having a higher prevalence of NPS pollutant sources, densely developed areas typically have less forest and other naturally vegetated lands that can act as a buffer between NPS pollutants and waterbodies.

3.3 WATER RESOURCES OF MASSACHUSETTS

Massachusetts ranks 45th out of the 50 states in surface area (approximately 8,300 square miles of dry land and inland water combined), yet its estimated 7 million inhabitants place it 16th in population (U.S. Census Bureau, 2023). More than 76% of the population resides in the eastern one-third of the state. As discussed above, areas of higher population density typically have a higher prevalence of NPS pollutant sources and less naturally vegetated land that can act as a buffer between NPS pollutants and waterbodies.

Massachusetts is located within two geological provinces: the Coastal Plain and the New England Upland. Cape Cod and the Islands form the Coastal Plain, which consists of low hills and plains covering unconsolidated sediments that form the most productive aquifers in the state. The New England Upland province, consisting of till and stratified drift above metamorphic and igneous rocks, provides small productive aquifers. Groundwater is a significant source of water in small communities and is used almost exclusively on Cape Cod and the Islands. Surface water is the primary source of water for all major urban areas in the state. Two thirds of Massachusetts' residents depend upon surface water for their needs. The Massachusetts Water Resources Authority (MWRA) supplies communities in the greater Boston area (about half the state usage of surface water) from the Quabbin and Wachusett reservoirs in the central uplands.

Annual precipitation averages about 48 inches and is fairly evenly distributed throughout the state. Average annual evaporation of surface water ranges from about 26 inches in western Massachusetts to about 28 inches in the eastern half of the state. Yearly runoff ranges from about 20 inches in Cape Cod to about 32 inches in the northwestern corner of the state. The lowest runoff generally occurs during July, August, and September. Runoff is highest in March in the eastern sections of the state and April in the western sections and at higher elevations (USGS, 1986). While the general patterns described here are from a 1985 survey, current evaporation and runoff values, while similar, have likely changed due to climate change and increased development.

Massachusetts incorporates all or a portion of nine major drainage systems—Hudson, Housatonic, Connecticut, Thames, Narragansett Bay, Mount Hope Bay, Boston Harbor, Merrimack, and Coastal—that, in turn, comprise 33 smaller river basins (i.e., watersheds) and coastal drainage areas that generally serve as the fundamental planning units of Massachusetts' surface water monitoring, assessment, and management programs (Figure 3.3). Table 3.1 summarizes general surface water resource statistics for Massachusetts.

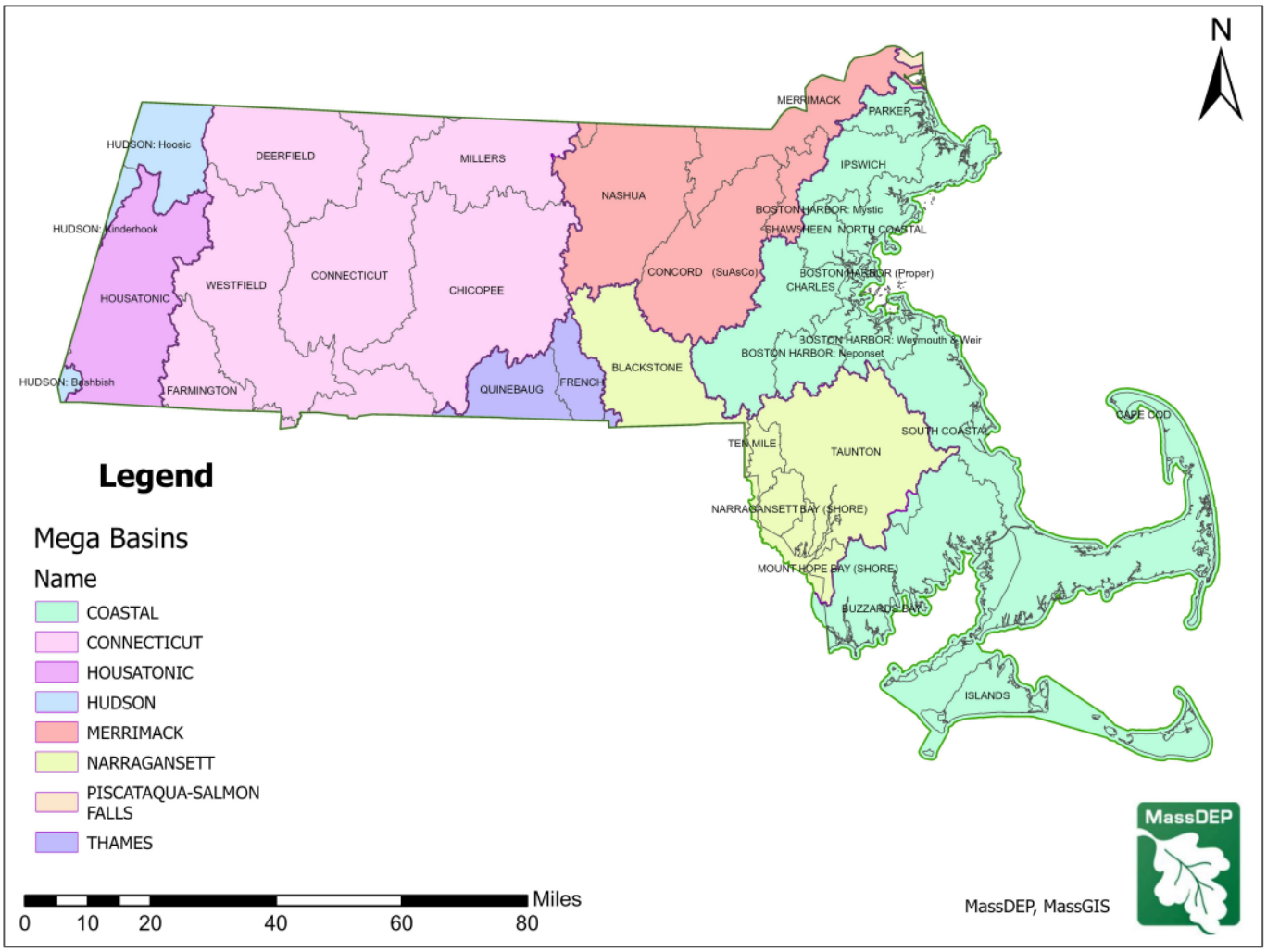


Figure 3.3. *Massachusetts major basins and sub-basins.*

Table 3.1. *Surface Water Resource Statistics for Massachusetts.*

Water Category	Water Type (units)	Value
Rivers[1]	Perennial river/streams (miles) Intermittent streams (miles) Ditches and canals (miles)	10,033 3,684 202
Lakes[2]	Number of lakes and ponds ≥ 5 acres Area of lakes and ponds ≥ 5 acres (acres) Number of lakes and ponds < 5 acres Area of lakes and ponds < 5 acres (acres)	2,622 153,514 24,479 15,506
Coastal Waters	Coastal waters[3] (square miles) Total tidal shoreline[4] (miles)	2,726 1,519
Wetlands	Marine and estuarine wetlands[5,6] (acres) Freshwater vegetated wetlands[5,7] (acres) Total area of wetlands (acres)	107,525 467,331 574,856

Information Sources (see 2022 Integrated List):

[1] Rees et al. 2010

[2] MassGIS 2010

[3] MassGIS 2015

[4] NOAA 1975, Maietta 1984, Gil 1985

[5] 2005 wetlands map layer (in preparation)

[6] Does not include 34,777 acres of eelgrass meadow

[7] Open water and agricultural cranberry bogs excluded

3.3.1 Assessment of Waters in Massachusetts

MassDEP is responsible for assessing the health of surface waters (rivers, lakes, and coastal waters) across the Commonwealth. To enable water quality assessments and listing of impaired waters, ambient monitoring data (for both targeted and statistical surveys) are collected by Watershed Planning Program staff, other state and federal agency partners, and numerous watershed and stakeholder monitoring groups to characterize the biological, physical, and chemical conditions of surface waterbodies statewide. The Massachusetts Surface Water Quality Standards (SWQS) establish designated uses for surface waters (such as Aquatic Life, Fish Consumption, Aesthetics, Shellfish Harvesting, Public Water Supply (Drinking Water), Primary Contact Recreation (e.g., swimming), and Secondary Contact Recreation (e.g., boating)), and associated numeric or narrative water quality criteria intended to protect designated uses. The Public Water Supply use is regulated through MassDEP's Drinking Water Program. Using the Massachusetts Consolidated Assessment and Listing Methodology (CALM) Guidance Manual, MassDEP

staff in the Watershed Planning Program compare surface water data to water quality criteria in the Massachusetts SWQS to determine if waterbodies are attaining their designated uses. It is important to note that not all waterbodies are assessed for all potential uses. Some waterbodies may be assessed for multiple uses, while others may be assessed for only one. Subsequent to the assessment, waterbodies are considered Fully Supporting (attaining their designated uses) or Not Supporting (not attaining their designated uses, which is indicative of impaired water quality); waterbodies can also have Insufficient Information to determine water quality conditions. The causes and sources of impairments are also identified. Results of these evaluations are published in the biennial Integrated Report (IR), which addresses CWA s.305(b), s.314, and s.303(d). Assessment and listing information contained in the IR is used to guide decisions concerning water resource management, protection, and restoration. Restoration plans (i.e., through TMDLs or NPS grant-funded projects) are then developed for impaired waterbodies.

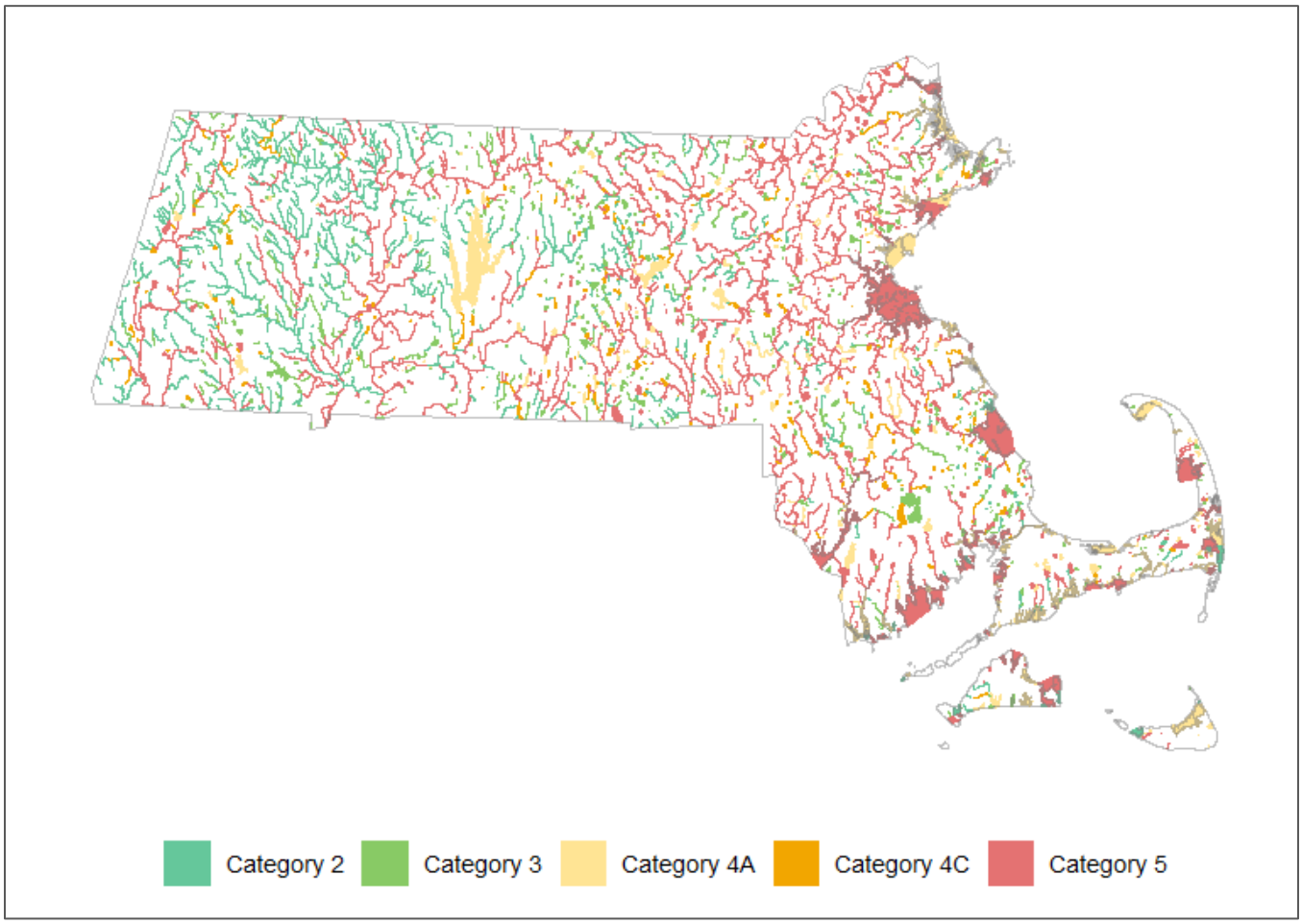


Figure 3.4. *Assessed waters in Massachusetts depicting assessment categories (2022 Massachusetts Integrated List of Waters).*

Assessment units (AUs) (i.e., the lake, estuary, river or stream segment being assessed) are assigned to one of the following categories:

Category 1: “Waters attaining all designated uses”

Category 2: “Attaining some uses; other uses not assessed”

Category 3: “No uses assessed”

Category 4a: “All TMDLs are completed”

Category 4b: “Impairment controlled by alternative pollution control requirements”

Category 4c: “Impairment not caused by a pollutant – TMDL not required”

Category 5: “Waters requiring one or more TMDL(s)” (i.e., the 303(d) List)

Category 5a: “303(d)-listed waters for which Alternative Restoration Plans have been completed.”

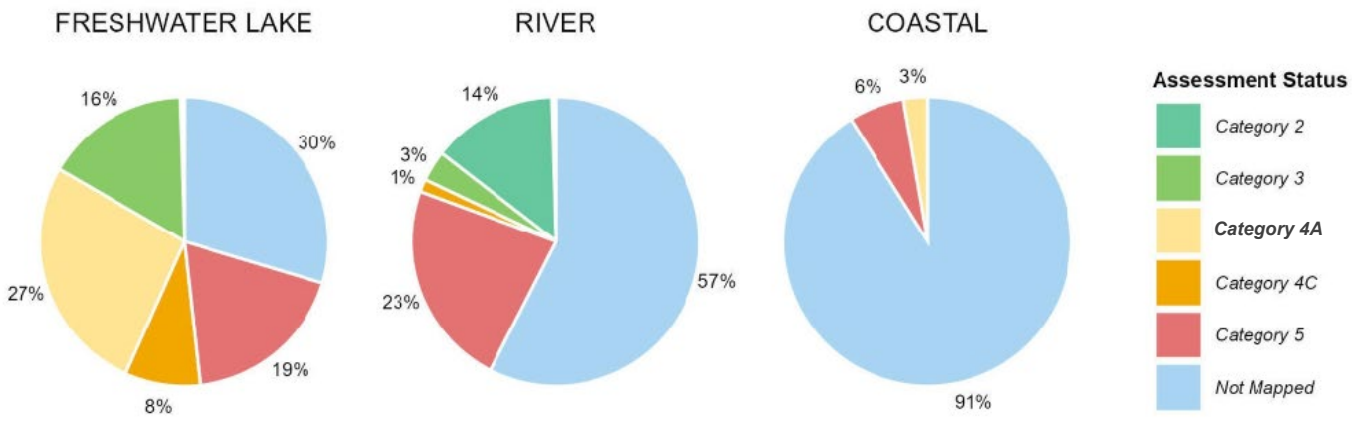


Figure 3.5. *Assessment status by waterbody type (2022 Massachusetts Integrated List of Waters). “Not Mapped” refers to waterbodies that have not been assigned assessment units, which are unique identification numbers assigned to waterbodies that are assessed by MassDEP for the biennial Integrated List of Waters Report.*

3.3.2 Assessed Waters Pollutant Source Categories

MassDEP defines pollutant categories based on the types of impairment sources used by USEPA’s Assessment, Total Maximum Daily Load Tracking and Implementation System (ATTAINS), an online system for accessing information about the conditions in the Nation’s surface waters. Within ATTAINS, pollutant source types are categorized as point source (originating from a single identifiable source such as a pipe), nonpoint source (diffuse sources that are transported by rain or snowmelt into waterways),

mixed (pollutants from either point or nonpoint sources), and unknown. The percentages of each pollutant source type for Massachusetts assessed waters are depicted in Figure 3.6.

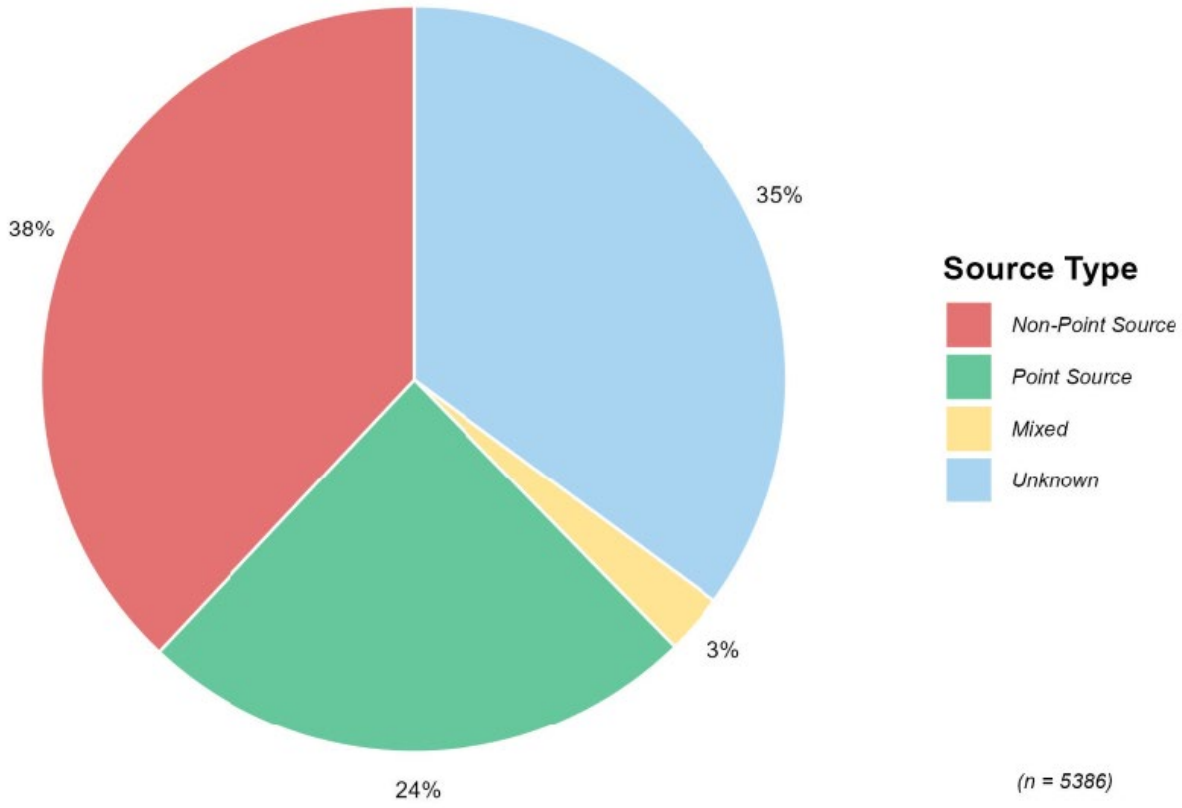


Figure 3.6. *Percentages of ATTAINS pollutant source types (based on ATTAINS) from the Final Massachusetts Integrated List of Waters for the Clean Water Act 2022 Reporting Cycle. The figure includes the number of ATTAINS assessment records for these categories ("n").*

3.4 NPS POLLUTANTS

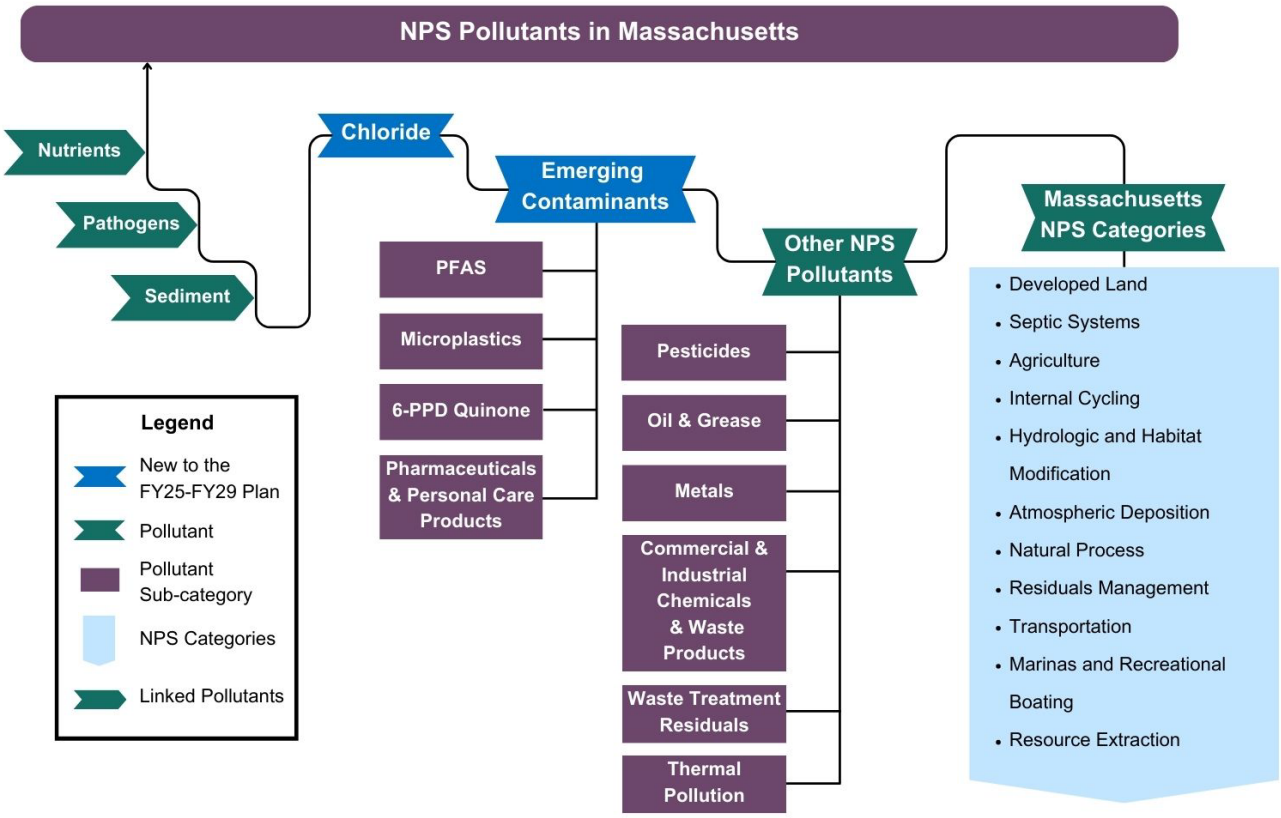


Figure 3.7. *Categories of NPS pollution addressed by the NPS management plan.*

Pollutants that impact the quality of the waters of the Commonwealth include:

- nutrients,
- pathogens,
- sediment,
- chloride,
- emerging contaminants, and
- other contaminants such as vehicular chemicals, industrial chemicals, metals, pesticides, and thermal pollution.

While NPS pollution is comprised of a wide variety of contaminants, nutrients, pathogens, and sediment are among the primary pollutants of concern in the Commonwealth of Massachusetts. The impacts of each type of pollutant are described in more detail below.

3.4.1 Nutrients

Figure 3.8. *Cyanobacteria bloom in an unnamed tributary to the Blackstone River in Millville, Mass. Photo: MassDEP.*

Nutrients (particularly phosphorus and nitrogen) impact water quality by accelerating eutrophication, a natural process in which, over a long period, a waterbody becomes enriched with nutrients, resulting in the increased growth of micro- and macro-organisms like plankton, algae, and plants. However, eutrophication can be accelerated by human activities that contribute excessive amounts of pollution, including nutrients, to waterways, leading to significant reduction in dissolved oxygen resulting in destruction of aquatic habitat. Additionally, climate change can exacerbate eutrophication in several ways. Warmer temperatures and extended growing seasons create favorable conditions for algae and plant growth. Increased rainfall and storm frequencies result in increased stormwater runoff that transports nutrients into waterways where they become available for plants to use. Conversely, droughts result in lower water levels, which leads to nutrient concentration and longer residence times in lakes, increasing the availability of nutrients for plants.

Increased nutrients resulting from human activities can have visible and harmful effects. High nutrient levels in waterways like streams, lakes, and estuaries (where freshwater meets saltwater), can promote excessive plant and algal growth. When these plants and algae die, the microorganisms that break down and decompose the dead vegetation deplete the water's oxygen supply. This, in turn, can lead to the death of fish and other aquatic organisms. This phenomenon can occur in fresh, brackish, and marine waterbodies. Excessive nutrients can also result in the formation of cyanobacteria (blue-green algae) blooms that produce cyanotoxins that can harm aquatic wildlife, bathers, livestock, and pets, and result in beach closures.

Excessive nutrients can affect human health in other ways as well. High nitrate levels in groundwater make drinking water unsafe for consumption. The long-term consumption of water with excessive levels of nitrate, a form of nitrogen often found in fertilizer, can cause serious illness and sometimes death.

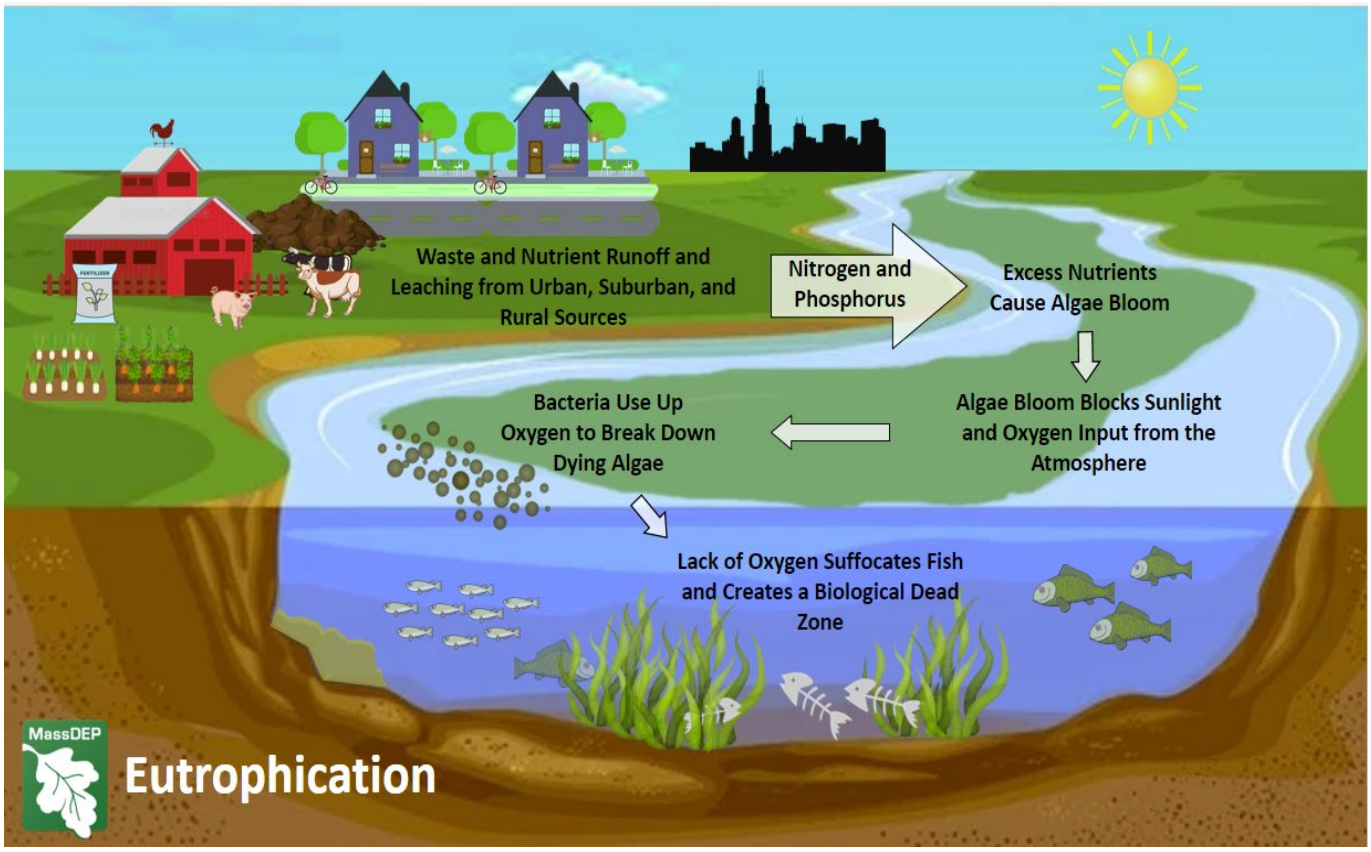


Figure 3.9. *Eutrophication is the process by which excess nutrients cause algal blooms, depleting the water of oxygen and stressing or killing animal life. Graphic: MassDEP.*

In the natural environment, nutrients are released when plant matter decays. Nutrients are also found in the feces of wildlife. Nutrient sources associated with human activity include fertilizer, pet waste, agricultural runoff, livestock manure, septic system discharge, leaky sewer lines, illicit discharges (discharges to a municipal storm sewer system that are not composed entirely of stormwater), and atmospheric deposition. Nutrients move relatively easily from upland areas to waterbodies. Nitrogen readily dissolves in water and is often directly transported from agricultural fields and pastures to streams through field drains or surface flow, or from lawns and gardens through storm drain systems. Phosphorus is less soluble in water, but attaches to soil particles, allowing it to enter waterbodies through the transportation and deposition of sediment in runoff. The reduction of nutrient pollution is both a federal and state priority.

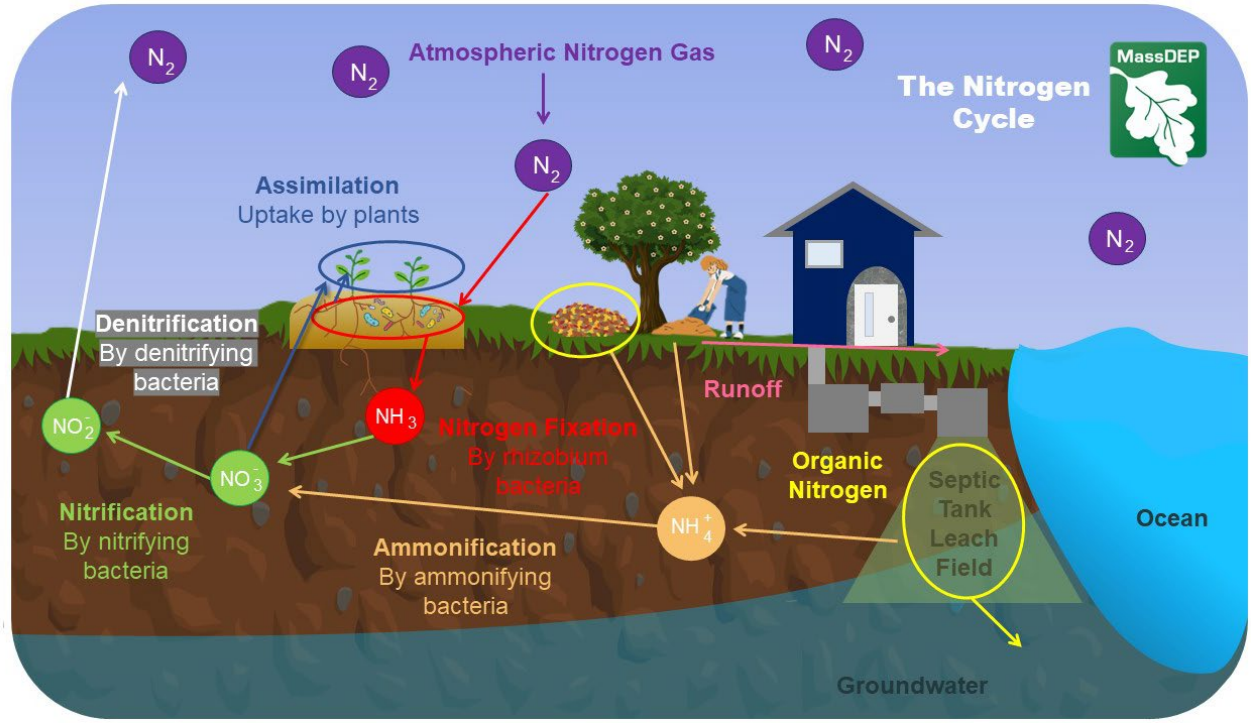


Figure 3.10. *The nitrogen cycle. Graphic: MassDEP.*

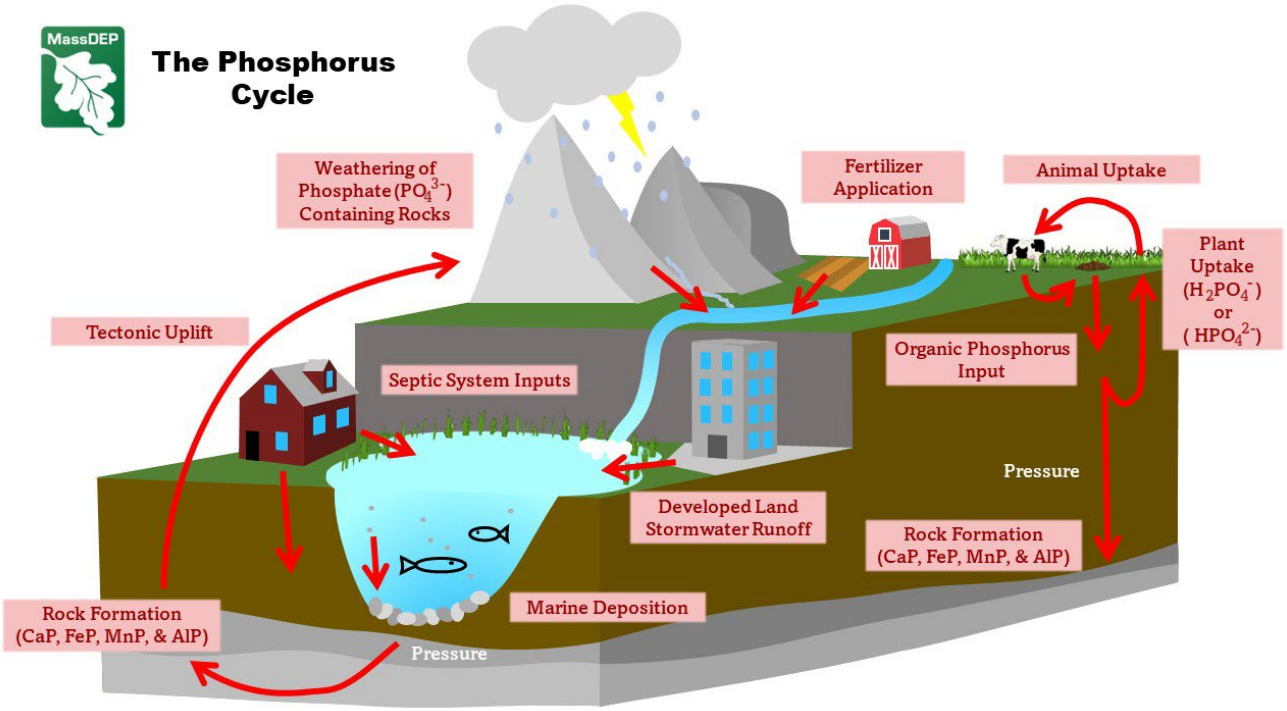


Figure 3.11. *The phosphorus cycle. Graphic: MassDEP.*

3.4.2 Pathogens

Waterborne pathogens are disease-causing microorganisms, including bacteria, viruses, and pathogenic protozoa. Pathogens are found in the feces of warm-blooded animals including humans, pets, livestock, and wildlife. When transmitted to humans, pathogens such as Giardia spp., norovirus, and others can cause a wide range of illnesses. *Escherichia coli (E. coli*) and enterococci are fecal coliform bacteria that are often found in conjunction with other pathogens in the digestive system. Therefore, they are used as indicator organisms for monitoring pathogens in fresh and salt water, respectively.

Figure 3.12. *The presence of pathogens in marine waters can contaminate shellfish, resulting in shellfish bed closures. Image source: Massachusetts Division of Marine Fisheries.*

Pathogen sources are diverse. During rainfalls and snow melts, untreated waste containing *E. coli* and other pathogens may wash into rivers, streams, lakes, estuaries, or embayments from developed and agricultural areas, such as fields and livestock facilities. Increased rainfall frequencies and volumes associated with climate change exacerbate pathogen loading due to increased stormwater runoff. Waterbodies can also become contaminated with pathogens via septic system failures, sewer line leaks, illicit discharges and combined sewer overflows (CSOs). People may be exposed to pathogens when these waters are used for recreation, shellfishing, or as a source of untreated drinking water.

Although there are rules and regulations governing the management of human waste, animal manure, and stormwater runoff from developed areas, the mitigation of pathogens in waterways continues to be a priority in Massachusetts.

3.4.3 Sediment

Sediment is the loose sand, clay, or silt that is transported by stormwater and settles to the bottom of a waterbody. Sediments may be located in rivers, streams, lakes, bays, and wetlands or accumulated behind or within artificial structures such as dams, levees, or canals. USEPA lists sediment as the most common pollutant in rivers, streams, lakes, and reservoirs. Any sediment with the reasonable potential to move from its present location due to normal flows of water or flood events, or released due to intentional or unintentional events, could be considered a source of pollutants.

Sediment transportation is a natural riverine process, but the presence of excess sediment in waterbodies is a water quality concern. Excessive sediments can smother critical aquatic habitats, cause physical harm to aquatic organisms, and adversely affect drinking water infrastructure, such as water supply intakes. The deposition of sediment can alter the shape of stream channels and increase stream-bank erosion. Increased rainfall frequency and intensity related to climate change can intensify erosion, resulting in higher sediment loads in stormwater runoff and stream channel erosion, and consequently, the deposition of sediment into waterbodies.

Figure 3.13. *Severe erosion and sedimentation associated with a stormwater outfall pipe. Photo: MassDEP.*

While natural erosion produces nearly 30% of the total sediment in the United States, erosion from human use of land accounts for the remaining 70%. Sedimentation includes the accumulation of clean sediments as well as sediments contaminated with pollutants from spills, legacy anthropogenic activities, or high levels of nutrients. Phosphorus and other contaminants such as metals and pesticides, attach to sediment, making sediment an efficient transporter of these pollutants into nearby waterbodies. Under certain conditions, phosphorus-laden lake bottom sediments can be significant contributors of phosphorus into the water column. Sediments may be located in rivers, streams, lakes, bays, and wetlands or accumulated behind or within artificial structures such as dams, levees, or canals. Any sediment with the reasonable potential to move from its present location due to normal flows of water or flood events, or released due to intentional or unintentional events, could be considered a source of pollutants.

3.4.4 Chloride

The presence of chloride concentrations in freshwater systems is a growing concern in Massachusetts. Chloride (Cl^-) is the anion formed when chloride-containing minerals (e.g. sodium chloride) are dissolved in water. Chloride levels in streams in the northeast United States have been rising for several decades (Savoie et al, 2017), primarily due to increasing seasonal use of road salts for deicing. While the presence of chloride in low concentrations is natural within freshwater systems, elevated concentrations can cause a range of detrimental ecological and environmental impacts and degrade the quality of water used for drinking, fishing, and irrigation. This process in which chloride and other dissolved salts accumulate is known as salinization. At low levels, chloride can negatively affect aquatic diversity and productivity. At elevated concentrations (those that exceed the acute and chronic chloride criteria of 860 mg/L acute and

230 mg/L, respectively, in the Massachusetts Surface Water Quality Standards (SWQS)), chloride is a toxic contaminant. In streams, lakes, and wetlands, elevated chloride concentrations harm aquatic vegetation and can change the native plant community structure. Chronic salt applications can also kill roadside vegetation and trees. The loss of vegetation due to chloride can cause soil to lose its ability to retain water and store nutrients and makes it more prone to erosion and sediment runoff. In addition, chloride is corrosive to exposed metal surfaces on automobiles and infrastructure. Chloride corrodes road surfaces and bridges and damages reinforcing rods, reducing infrastructure safety, and increasing maintenance and repair costs. The main source of excess chloride in rivers, lakes, wetlands and groundwater is deicing salts applied to roads, parking lots and walkways. MassDEP has been monitoring discrete chloride in streams and rivers for over three decades. In 2015, the MassDEP Watershed Planning Program (WPP) initiated a long-term monitoring project to collect continuous chloride data using in-stream

Table 3.2. *Chloride Impaired Waterbodies in Massachusetts (MassDEP, 2023b).*

Watershed	Waterbody	Assessment Unit	Class	Qualifiers[1]
Blackstone	Dark Brook	MA51-16	B	
	Unnamed Tributary	MA51-08	B	WW, CS
	Unnamed Tributary			
Boston Harbor: Mystic River	Aberjona River	MA71-01	B	WW
	Alewife Brook	MA71-20	B	WW, CSO
	Little River	MA71-21	B	
Charles	Beaver Brook	MA72-28	B	
	Cambridge Reservoir	MA72014	A	PWS, ORW
	Cambridge Reservoir, Upper Basin	MA72156	A	PWS, ORW
	Hobbs Brook	MA72-45	A	PWS, ORW
	Hobbs Brook	MA72-46	A	PWS, ORW
	Sawmill Brook	MA72-23	B	
	Unnamed Tributary	MA72-47	A	PWS, ORW
	Unnamed Tributary	MA72-48	A	PWS, ORW
Concord (SuAsCo)	Coles Brook	MA82B-22	B	
Ipswich	Unnamed Tributary	MA92-26	B	
Merrimack	Fish Brook	MA84A-40	A	PWS, ORW
Nashua	Gates Brook	MA81-24	A	PWS, ORW
	Scarletts Brook	MA81-25	A	PWS, ORW
	Unnamed Tributary	MA81-49	A	PWS, ORW
	Unnamed Tributary	MA81-54	A	PWS, ORW
Shawsheen	Unnamed Tributary	MA83-15	B	
	Unnamed Tributary	MA83-20	B	

*Acronyms: *CSO = Combined Sewer Overflow, ORW = Outstanding Resource Water, PWS = Public Water Supply, WW = Warm Water*

1 - *Qualifiers and descriptions of the current Massachusetts Surface Water Quality Standards (SWQS) regulation included in this document are provided for informational purposes only, see the SWQS (MassDEP, 2021b). The actual SWQS regulation shall control in the event of any discrepancy with the description provided. As a result, no person in any administrative or judicial proceeding shall rely upon the content of this document to create any rights, duties, obligations, or defenses, implied or otherwise, enforceable at law or in equity.*

water conductivity (as a surrogate) and a conductivity:chloride regression equation to calculate chloride at 30-minute intervals. The results of this continuous monitoring conducted between 2015 and 2020 have been summarized by WPP in a WPP data report (MassDEP, in progress). As more continuous chloride data are collected at different locations across MA, it is estimated that the number of chloride impairments (to the aquatic life designated use) will continue to increase, especially in areas with greater impervious surfaces.

3.4.5 Emerging Contaminants

CECs are chemicals or materials characterized by a perceived, potential, or real threat to human health or the environment and/or by a lack of published regulations. CECs are not necessarily new chemicals. They include pollutants that have often been present in the environment, but whose presence and significance are only now being evaluated. Contaminants may be "emerging" because a new environmental source, pathway, or harmful effect to humans or the environment has recently been identified (often because of improved analytical chemistry detection levels) and they have no regulatory standard.

CECs refer to many kinds of chemicals, including those associated with pharmaceuticals, personal care or household cleaning products, industrial chemicals, lawn care, and agricultural products. These chemicals are used in the normal course of human activity and can ultimately enter surface and groundwater through diverse routes, such as wastewater effluent, surface runoff, landfill leachate, and sewage overflow. Continuous detection of CECs at low levels in surface water is therefore becoming increasingly common. The persistent presence of CECs at concentrations relevant to the environment poses a significant threat to aquatic species, potentially leading to bioaccumulation and biomagnification through the food chain, thereby endangering even non-aquatic species that consume contaminated fish.

Current treatment technologies are not designed to eliminate these chemicals from municipal/industrial wastewater. Therefore, it becomes imperative to identify the sources and extent of CECs to implement measures at the source and protect waterbodies. Monitoring efforts have revealed the widespread occurrence of CECs in surface waters in the United States. Among the myriad CECs detected, prioritization for routine monitoring and future regulation hinges on factors such as their ecotoxicity, potential health impacts, public perception, and frequency of occurrence in environmental media.

NPS pollution, such as agricultural runoff, soil erosion, urban runoff, atmospheric deposition, and landfill leachate are significant contributors to the pollution of surface water sources with CECs. Their diffuse nature, spanning multiple locations across landscapes rather than specific points, poses challenges

in accurately identifying and tackling the sources of contamination. Therefore, initiating monitoring efforts is a primary step to address NPS pollution due to CECs.

Per- and polyfluoroalkyl substances (PFAS):

PFAS are a large group of environmentally persistent manufactured chemicals and have been utilized in industrial and consumer goods since the 1940s. These have been used in a wide variety of products including fire-fighting foams, lubricants, metal coatings, detergents, inks, varnishes, coatings for various surfaces, waxes, and repellents for leather, paper, and textiles. PFAS are defined by the Organization for Economic Co-operation and Development (OECD, 2021), as fluorinated substances that contain at least one fully fluorinated methyl or methylene carbon atom (without any Hydrogen (H), Chlorine (Cl), Bromine (Br), or Iodine (I) atom attached to it), and any chemical with at least a perfluorinated methyl group (trifluoromethyl [CF_3]) or a perfluorinated methylene group (difluoromethylene [CF_2]). Their exceptional stability against heat, light, and chemical processes, owing to the strong carbon-fluorine bond, results in their persistence in the environment, resulting in the label "forever chemicals." Consequently, PFAS raise concerns due to their slow degradation in the environment (i.e., they do not fully break down and instead produce "daughter products" of possibly greater toxicity), potential to leach into water sources, and tendency to bioaccumulate in fish and wildlife, posing hazards to both wildlife and humans.

Figure 3.14. *PFAS molecule. Image source: NIST.gov*

PFAS, once in the environment, will continue to move through a variety of media including soil, groundwater, surface water, and air. The widespread distribution of PFAS in the environment is well-documented, with studies revealing their presence in rivers, lakes, drinking water, and aquatic and terrestrial life. Further, research indicates that heightened exposure to elevated PFAS concentrations may disrupt endocrine functions and lead to reproductive and developmental abnormalities. Considering these adverse effects, certain PFAS restricted by the Food and Drug Administration are (FDA)

Nonpoint Sources of PFAS

Unregulated nonpoint sources, such as surface runoff, precipitation, atmospheric deposition, drainage, the biological and chemical breakdown of precursor compounds into stable PFAS, and the degradation of consumer products, pose a significant threat to surface water quality.

for limited use in cookware, food packaging, and food processing equipment.

In addition, in April 2024, USEPA issued a final National Primary Drinking Water Regulation that established legally enforceable levels (called Maximum Contaminant Levels or MCLs) for six PFAS in drinking water. However, there are no regulations or standards in place for surface water sources, which serve as the primary source for many drinking water treatment plants. Gathering data on PFAS presence in surface water supports future anticipated regulation of PFAS in surface water.

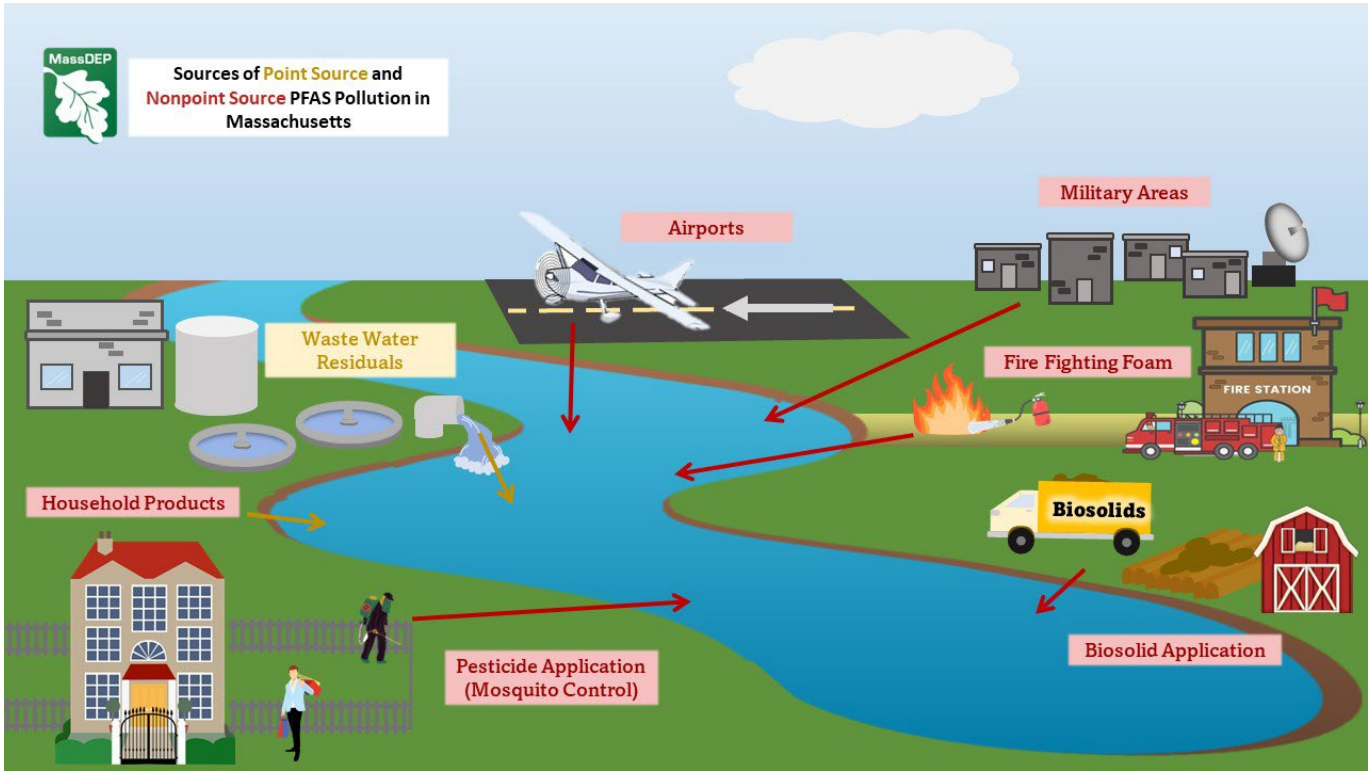


Figure 3.15. *Sources of PFAS Pollution in Massachusetts. Graphic: MassDEP.*

Microplastics:

USEPA defines microplastics (MPs), as plastic particles less than five millimeters in size. MPs are tiny plastic particles resulting from both commercial product development (Primary MPs) and the breakdown of larger plastics (Secondary MPs). Primary microplastics are intentionally manufactured in small sizes for their use in cosmetics, biomedical products, and microfibers of clothing and other textiles, such as fishing nets.

Nonpoint Sources of Microplastics

Apart from point sources (wastewater effluent), both primary and secondary MPs can enter surface water via NPS pathways such as land and agricultural runoff.

Secondary microplastics are plastic particles that break down from larger plastic materials, such as food wrapping, water bottles, plastic bags, tires, and synthetic textiles.

The main problem pertaining to MPs is the likely degradation into smaller nanoplastics (1 µm or 1000 nanometers) through chemical weathering processes, mechanical breakdown, and even through the digestive processes of animals. The process of decomposition can take hundreds to thousands of years, which could lead to mass accumulation of plastic waste in the environment.

Studies have found MPs in every ecosystem on the planet, from the Antarctic tundra to tropical coral reefs, and have been found in food, beverages, and human and animal tissue. In addition, MPs can bind with other harmful chemicals/CECs before being ingested by organisms, which magnifies the implications of MPs. Similar to other CECs, water/wastewater treatment facilities cannot remove all traces of MPs.

6PPD-quinone:

The chemical N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine is known as 6PPD. This chemical is a common automotive tire additive and acts as an antioxidant, which prevents tires from breaking down due to reactions with ozone and other reactive oxygen species in the air. Apart from tires, 6PPD is also found in other rubber products such as footwear, synthetic turf infill, and synthetic playground surfaces. It can form a highly toxic quinone transformation product, 6PPD-quinone (6PPDQ), during exposure to gas-phase ozone. Research has found that the presence of 6PPDQ in waterbodies is highly toxic (Acute toxicity, LD_{50}[1]: 0.004- 82.1 µg/L) to certain species of fish, including Coho Salmon (*Oncorhynchus kisutch*),

Nonpoint Sources of 6PPD-quinone

Driving causes tires to release dust and small particles containing 6PPDQ, which travels via stormwater runoff through drainage systems when it rains and, eventually, finds its way into surface waters. Urban stormwater systems are not designed to capture these contaminants. Moreover, failing to contain stormwater due to increased urbanization and storm events can lead to direct conveyance of 6PPDQ to vulnerable aquatic ecosystems.

[1] LD_{50} is a term used in toxicology to measure the amount of a toxic substance that is lethal to half of a population of organisms exposed to it. LD_{50}s are usually expressed as the weight of the chemical per unit of body weight (mg/kg).

Rainbow Trout (*Oncorhynchus mykiss*), and Brook Trout (*Salvelinus fontinalis*).

Pharmaceuticals and personal care products (PPCPs):

Pharmaceuticals and personal care products (PPCPs) are two of the most abundant classes of CECs in the environment. PPCPs "are a diverse group of chemicals that include all drugs (both prescription and over-the-counter medications) or non-medicinal consumer chemicals, such as the fragrances (musks) in lotions and soaps and the ultraviolet filters in sunscreens" (USEPA, 2013) and "chemicals used by agribusiness (some pharmaceuticals and animal care products) to enhance growth or health of livestock" (Illinois Sustainable Technology Center, 2024). In addition, metabolites and transformation products of PPCPs are also considered ECs. Further, a significant number of studies reported the presence of PPCPs in aquatic and terrestrial ecosystems (sub-nanogram per liter [sub-ng/L] to more than microgram per liter [µg/L]). The USEPA has identified PPCPs as CECs because little is known about the impact of these contaminants on human health or the environment when released into ecosystems. The biological activity of PPCPs and their potential bioaccumulation and biomagnification via aquatic food web emphasize their ability to disrupt ecological processes and functions in freshwater ecosystems. The exposure of residual PPCPs to different forms of life has been linked to an array of carcinogenic, mutagenic, and reproductive toxicity risks.

Nonpoint Sources of PPCPs

Multiple sources of residual PPCPs in the environment have been identified including urban runoff, wastewater treatment plant discharges and residuals, agriculture runoff (pharmaceuticals used in animal husbandry or leaching during biosolid and manure applications), and septic systems.

3.4.6 Other NPS Pollutants

MassDEP considers the pollutants described above as priority contaminants, but that does not diminish the impacts of other types of pollutants that threaten and/or impair the Commonwealth's waterways and groundwater. Other contaminants associated with our daily activities and use of the land include herbicides and pesticides, oil and grease, metals, industrial chemicals, and thermal impacts of stormwater runoff.

Pesticides/Herbicides

Pesticides are a class of chemicals that control unwanted insects and plant growth. They can have severe impacts in the aquatic environment. Pesticides may kill aquatic wildlife, including fish, aquatic reptiles and amphibians, mussels, and other aquatic invertebrates. The decay of aquatic plants killed by

herbicides depletes oxygen levels and can result in fish kills. Short-term effects include changes in water chemistry and plant communities, which can alter the habitat for aquatic wildlife. Pesticides may kill aquatic wildlife, including fish, aquatic reptiles and amphibians, mussels, and other aquatic invertebrates. Pesticide contamination may have a cascading effect if contaminated organisms such as fish are consumed by predators like raptors and bald eagles. Additionally, the contamination of surface and groundwater by pesticides and herbicides can impact public health if the waters supply private or public drinking water.

Herbicides and pesticides may originate from multiple sources. They may be used on lawns, gardens and other landscaped areas, including recreational fields, to enhance their appearance and maintain playability, and agriculture fields to control pests and unwanted vegetation. Herbicide contamination may result from applications to kill cover crops or to eradicate undesirable plants and weeds, while pesticide contamination may result from the use of products that are applied to control a wide variety of pests. If improperly applied, excess chemicals can be carried into surface water and groundwater from wind, rain, or irrigation. Another potential source is wash or rinse water from herbicide and pesticide spraying equipment. Water used to clean the inside of spray tanks or equipment may be drained to a small land area that may lead to groundwater contamination. Herbicides and pesticides may also contaminate surface waters by attaching to sediment and organic matter and being transported by stormwater runoff, similar to phosphorus.

Oil and Grease

Oil and grease (including fats) may come from a variety of sources and have negative impacts on water quality. Motorized vehicles, such as cars, trucks, construction equipment, farm equipment, and lawn and garden equipment may be sources of oil and other hydrocarbons. Oils and grease may enter the environment through accidental or intentional spills, such as the dumping of used oil and grease onto the ground or into storm drains. Oil and grease dumped into storm drains can clog pipes, preventing them from functioning properly. Oil and grease can be toxic to aquatic organisms and can deplete oxygen levels in the water, which can be deadly to aquatic species. Oil and grease can form films on surfaces and shorelines, smother aquatic plants, and lead to environmental degradation. Petroleum hydrocarbons found in some oils and grease can be mutagenic (capable of inducing genetic mutation) and carcinogenic (having the potential to cause cancer), and can harm humans, animals, and aquatic organisms.

Metals

Heavy metals, extracted from mines and found in a variety of products, can be transported to waterbodies as a form of NPS pollution. These metals include lead, zinc, and cadmium. Metals often are transported to waterbodies via sediment that runs off from various sites. Metals can pollute waterbodies

due to discharges from Municipal Separate Storm Sewer Systems (MS4s) and wastewater treatment facilities, as well as runoff from mines, land disposal sites, brownfields, sites affected by recent forest fires, and industrial operations. Metals are incorporated into motor vehicle parts as well as fluids used in motor vehicles, which can be carried to waterbodies as they erode or are spilled. Heavy metals are found in biosolids such as fertilizers, which are applied to land and can runoff in rainy conditions. Metals can also be released into the air, later allowing them to enter waterbodies via deposition. Heavy metals in the environment pose significant health threats to people and ecosystems alike, some being acutely toxic to humans and other organisms. Heavy metals do not degrade, instead accumulating in the environment and up the food chain and are very difficult to remediate.

Commercial and Industrial Chemicals and Waste Products

Surface and groundwater may be contaminated by commercial or industrial chemicals and waste products by accidental spillage, mishandling, or improper storage or disposal. Point source industrial discharges in Massachusetts are regulated by the USEPA via the National Pollutant Discharge Elimination System (NPDES). However, NPS contamination occurs when rain or snow melt picks up and carries industrial chemicals into surface waters via runoff.

Waste Treatment Residuals

Residuals are the end products of various types of waste treatment processes. Residuals management includes activities related to consolidation and management of wastes generated by residential, commercial, and industrial processes, including drinking water and sewage treatment. Many of these activities are regulated, and extensive requirements are typically placed on these sites. However, the potential for offsite transport of NPS pollutants remains, as does the potential for better management with improved BMPs. Additionally, not all pollutants are treated by waste treatment processes. These may include PFAS, pharmaceuticals, personal care products, and microplastics. Residuals management may have impacts on Communities with Environmental Justice populations because these sites are often located in or near these communities, where they can have deleterious impacts on soil, water, and air quality. Waste treatment residuals may include wastes and leachate from landfills, hazardous waste sites and brownfields; treated and untreated plant and animal residues from food processing facilities; approved

Leachate

Rainwater that has filtered through landfills or contaminated sites and leached, or extracted, chemicals from materials at those sites. Leachate can be a source of NPS pollution to surface and groundwater.

sludge from anaerobic digesters, waste treatment plants, and septic tanks; liquid or solid agricultural waste such as milk room wastes, lagoon effluent, and liquefied manures; and composted agricultural, industrial, and residential wastes.

In Massachusetts, potential NPS pollution impacts associated with landfills, contaminated areas, and waste management sites are primarily addressed through the Massachusetts Superfund Law (MGL Chapter 21E), the Massachusetts Solid Waste Facility Regulations (310 CMR 19.000), Regulations for Land Application of Sludge and Septage (310 CMR 32.00), and Site Assignment Regulations for Solid Waste Facilities (310 CMR 16.00).

Figure 3.16. *Raw sewage adhered to the substrate of a stream. Photo: MassDEP.*

Thermal Pollution

Thermal pollution is the influx of warm water into a waterbody that results in a rapid change in water temperature. Stormwater runoff from heated surfaces, particularly parking lots and roads, may impact surface waters by temporarily raising water temperatures, stressing and potentially killing aquatic organisms in the discharge area. This is especially critical in streams that are cold water habitats. These habitats support fish, such as trout, and other organisms that are sensitive to and may be impacted by warmer waters. The impacts of thermal pollution are intensified by the removal of riparian (stream- or lakeside) vegetation, which exposes the water surface to sunlight, and channel alteration and damming, which slows water and increases the exposure time to sunlight. Thermal pollution is exacerbated by intensified rainfall amounts associated with climate change that result in increased stormwater runoff.

3.5 MASSACHUSETTS NPS CATEGORIES

Massachusetts has assigned NPS categories and subcategories within the ATTAINS pollutant source types. The Massachusetts major and minor primary NPS categories and subcategories are identified in Figure 3.17 and are described in the sections below.

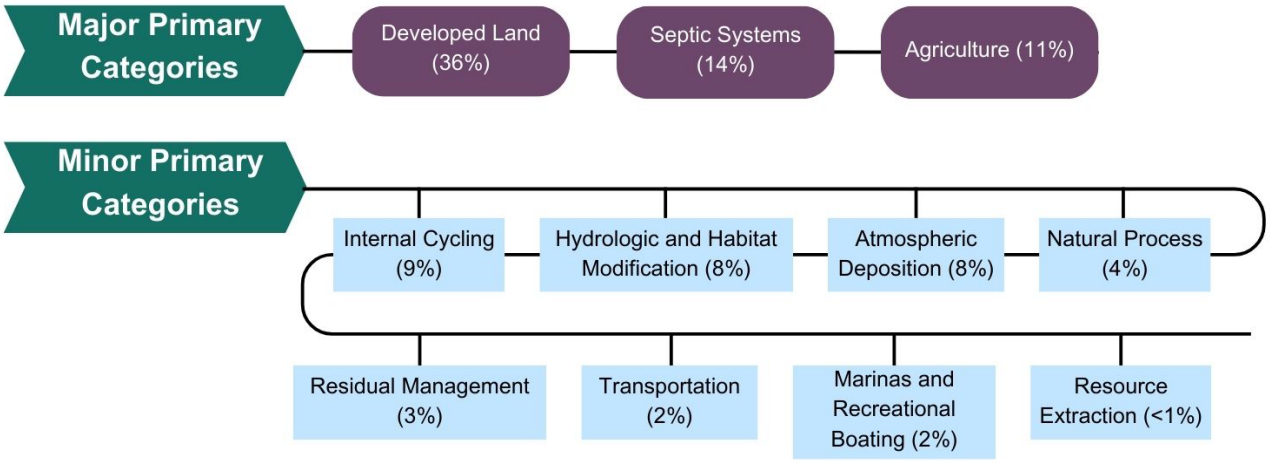


Figure 3.17. *MassDEP Major and Minor Primary NPS categories based on Massachusetts ATTAINS assessment records.*

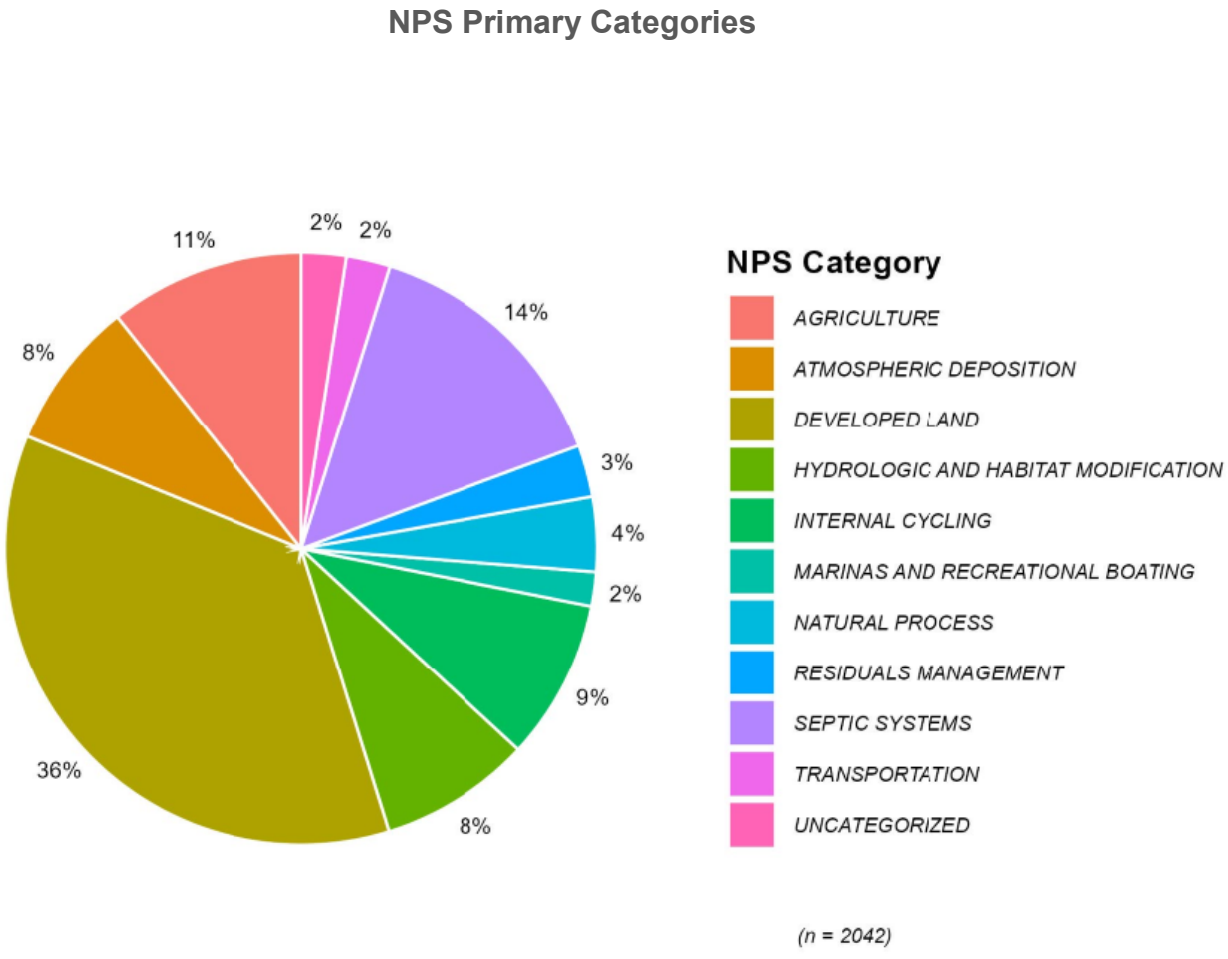


Figure 3.18. *Massachusetts ATTAINS Primary NPS categories. The figure includes the number of ATTAINS assessment records for these categories ("n").*

MassDEP has divided NPS primary categories into major (greater than 10% of impaired waters) and minor primary (less than 10% of impaired waters) categories. The major categories are Developed Land, Septic Systems, and Agriculture, based on ATTAINS data shown in Figure 3.18. The major primary NPS categories are discussed in Section 3.5.1 and the minor primary NPS categories are discussed in Section 3.5.2. The Major Primary NPS categories and their associated pollutants are depicted in Figure 3.19.

3.5.1 Massachusetts Major Primary NPS Categories

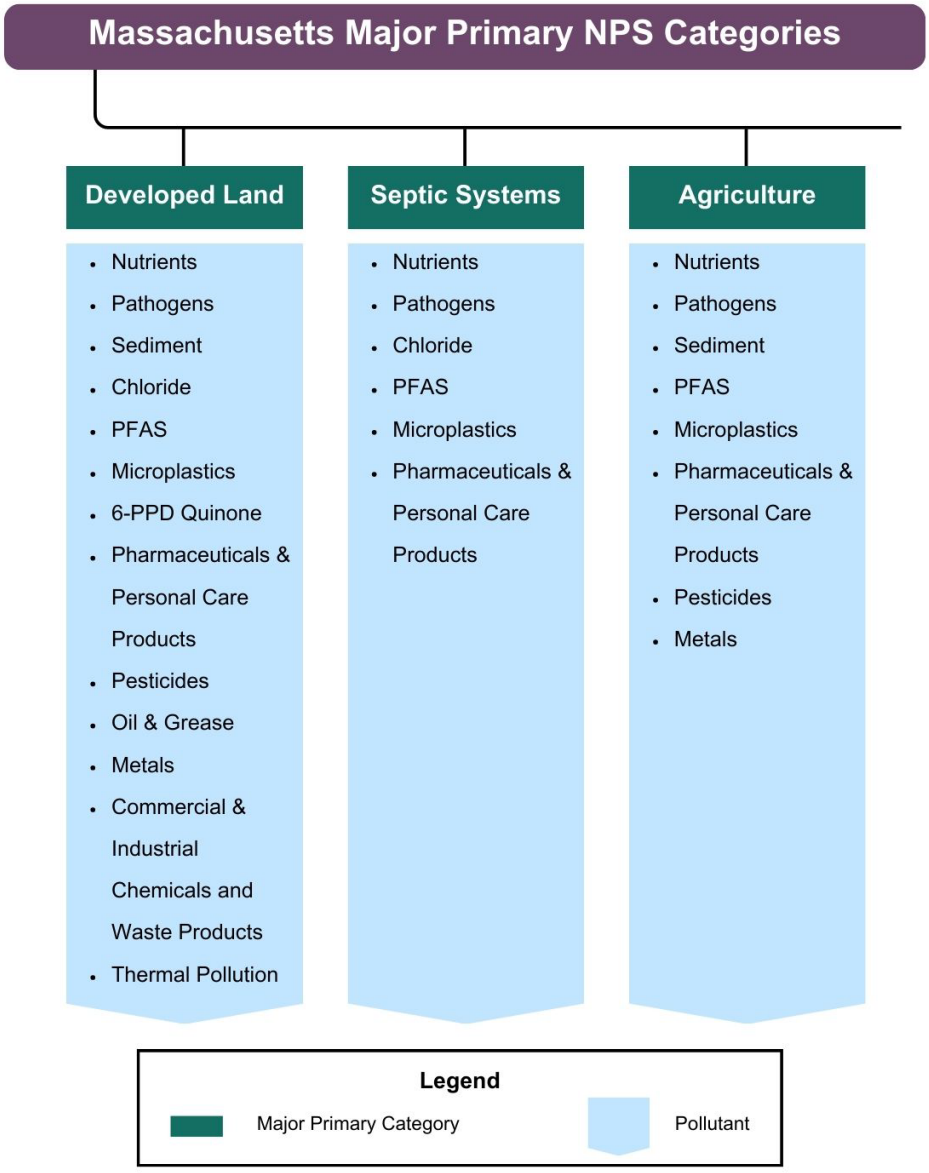


Figure 3.19. *Massachusetts ATTAINS Major Primary NPS categories and their associated pollutants.*

Developed Land

Figure 3.20. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Developed Land.*

Developed land has been altered for human use and includes activities associated with the use and maintenance of commercial, institutional, and industrial properties, suburban and rural residential areas, parking lots, golf courses, athletic fields, lawns and other landscaped areas, construction and post-construction sites, and vacant lots. Developed land is characterized by impervious surfaces (buildings, roof tops, roads, parking lots, and sidewalks) that impact the local natural hydrology by preventing rainwater and snowmelt from infiltrating into the ground. Rainwater that does not infiltrate becomes stormwater runoff, which typically flows along the ground from impervious areas into storm drain systems and is then discharged to areas where it can soak into the ground or flow into nearby waterbodies. As stormwater moves across the developed landscape, it picks up and transports a wide variety of pollutants. As a result, stormwater runoff can contribute a significant amount of NPS pollutants to waterways. NPS subcategories of Developed Land based on ATTAINS sources are provided in Figure 3.20, and a summary of ATTAINS sources associated with Massachusetts NPS subcategories of Developed Land is provided in Figure 3.21. Pollutant sources associated with subcategories under the Developed Land NPS category are described below.

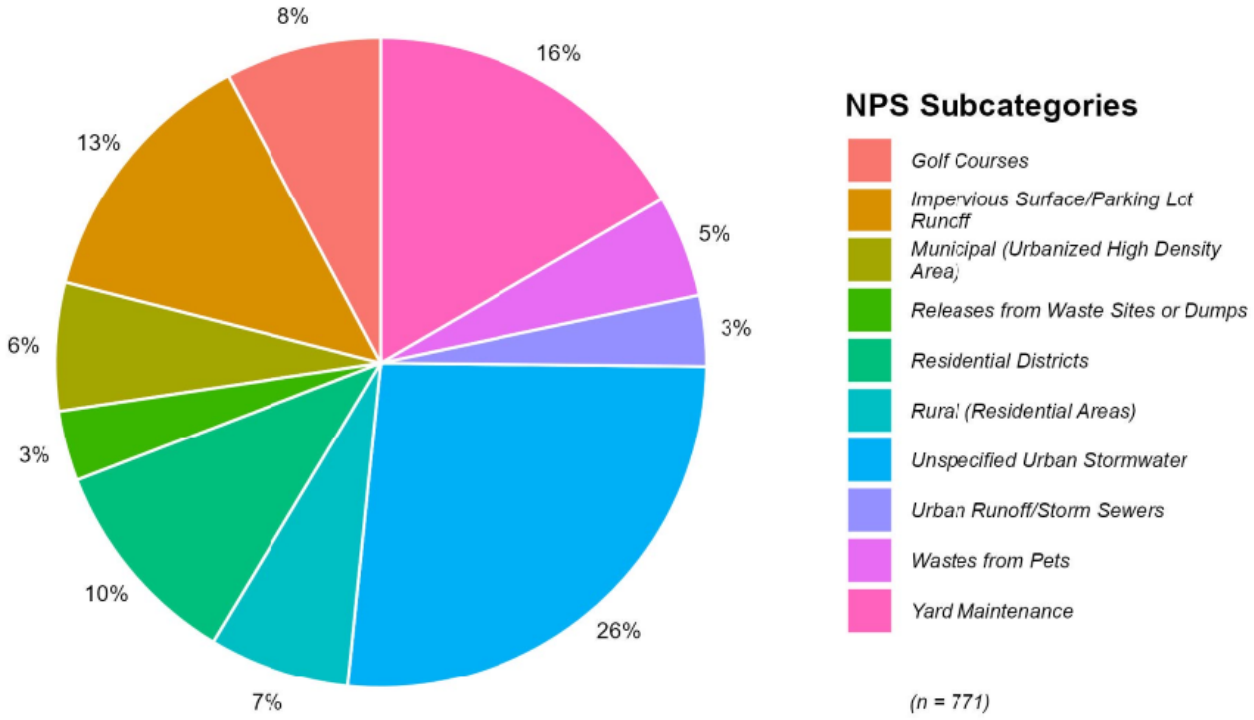


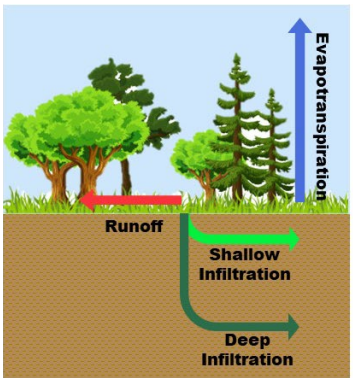
Figure 3.21. *NPS Impairments from Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Developed Land. The figure includes the number of ATTAINS assessment records for these categories ("n").*

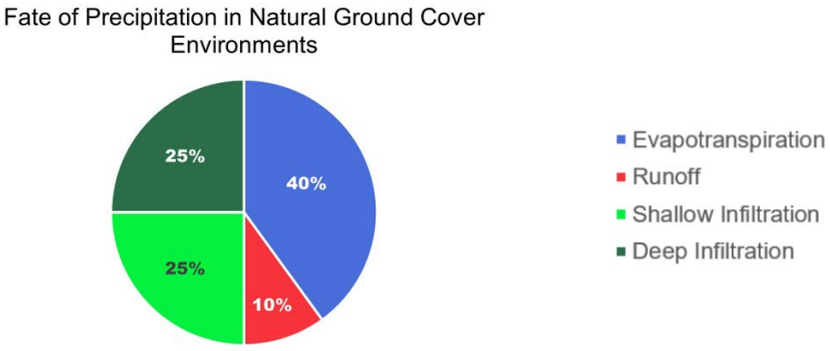
Commercial Districts, including industrial parks, shopping centers and office complexes, can be a source of NPS pollutants that are picked up by stormwater or snowmelt and transported into nearby waterways through overland flow or via storm drain systems. These districts typically contain large impervious surface areas associated with buildings, parking areas, driveways, and sidewalks, which affect the local natural hydrology by preventing rainfall and snowmelt from soaking into the ground (Figure 3.22). Parking areas can be sources of automative pollutants such as gasoline, oil, antifreeze, windshield washer fluid, and metals from brakes and engine wear. Winter ice management can contribute sand and ice melt chemicals (typically sodium chloride or rock salt) from paved surfaces. Shopping centers and other commercial areas, especially those with fast food establishments, can be significant sources of windblown and floatable trash. Bare soils from foot traffic, parking or driving on vegetated areas, or simply poor maintenance can result in erosion and contribute to sedimentation. Activities in commercial and industrial areas may include the use, handling, and storage of materials and chemicals. The improper handling and storage of these materials may result in spills and accidental releases of potentially harmful chemicals into the environment. The maintenance of commercial and industrial buildings and landscapes may contribute contaminants such as paints, stains and solvents, cleaning chemicals, pesticides, fertilizers, and gasoline, oil, and solvents associated with lawn care equipment.

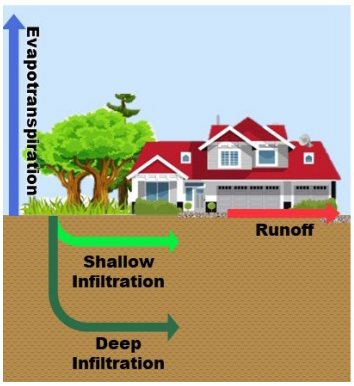
Golf Courses are associated with intensive turf management practices and can be sources of fertilizer and pesticides, as well as chemicals associated with maintenance equipment. Golf courses may also be attractive to wildlife such as migratory and non-migratory waterfowl, which forage on the turf, and can be sources of nutrients and pathogens via their feces.

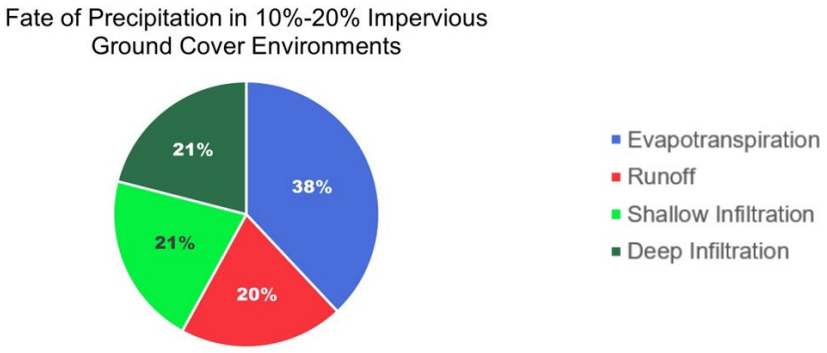
Impervious Surface/Parking Lot Runoff can be a source of pollutants associated with vehicles, as previously stated, as well as other chemicals such as fertilizers and pesticides from property maintenance. Parking lots can also be sources of sediment from erosion, chloride and sand from winter ice management, and thermal pollution.

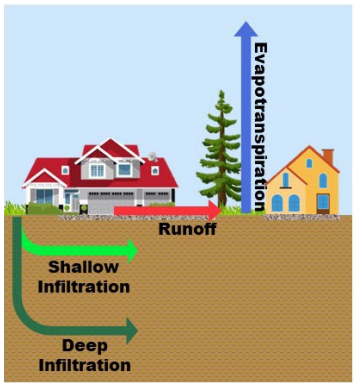
Municipal (Urbanized High-Density Area) properties (town or city halls, schools, libraries, and public works facilities) are typically associated with high levels of impervious surfaces such as buildings and parking areas that contribute to stormwater runoff. These sites may contribute a wide variety of pollutants such as those associated with building and campus maintenance, stored chemicals and materials, vehicle parking, municipal vehicle and equipment maintenance, sediment from bare soils and stockpiled soil and gravel, and sand and ice melt chemicals (typically sodium chloride or rock salt) from winter ice management.

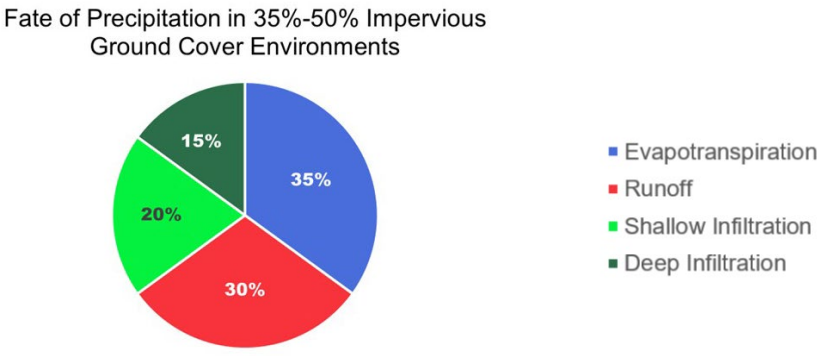


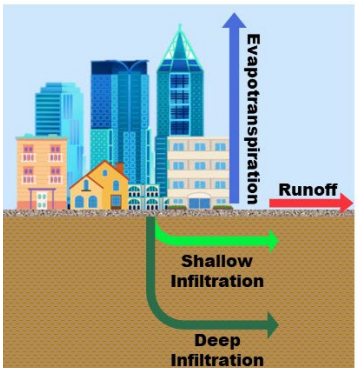












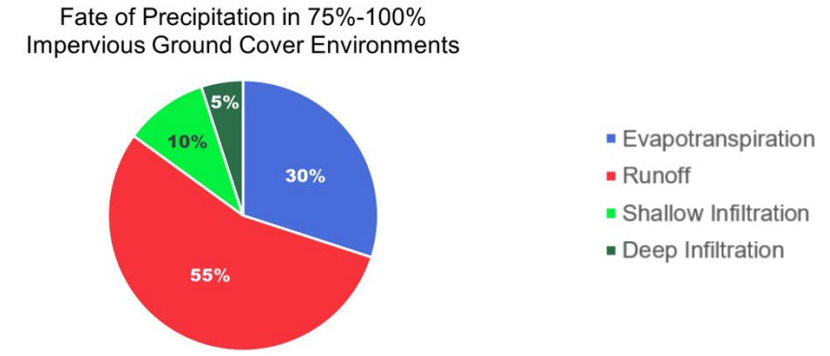


Figure 3.22. *Land development affects the infiltration of stormwater into the ground. As the amount of developed (impervious) surfaces increases, infiltration decreases, and stormwater runoff increases. Graphic: MassDEP.*

NPS Pollution from Military Base Facilities (Other Than Port Facilities), like NPS associated with commercial districts, may include sources such as fuel, chemicals, and materials associated with military activities, equipment, and facilities maintenance. NPS pollutants such as vehicle chemicals, fertilizers, pesticides, and pet waste may be associated with on-base housing. Other contaminants may include chemicals and metals associated with ordnance and PFAS from fuel fire suppression training and emergency response.

Other Turf Management may include the maintenance of lawn areas as well as athletic fields and parks. As with golf courses, NPS pollutants associated with this category may include fertilizer, pesticides, and chemicals associated with the use and maintenance of equipment, and nutrients and pathogens associated with the feces of foraging waterfowl.

Pesticide Application, which includes the application of pesticides to manage nuisance insects and herbicides to kill unwanted plants and weeds, may occur in many Developed Land scenarios. Commercial and industrial businesses may use pesticides to control unwanted insects like termites and cockroaches and animals such as mice and rats while herbicides may be used to maintain lawns and landscaped areas. In residential settings, pesticides may be used to deter insects such as lawn and garden grubs, fleas and ticks and to keep unwanted pests from damaging vegetable gardens. Pesticides may also be used to control mice populations. In agricultural scenarios, herbicides and pesticides are used to protect and enhance the growth of crops by suppressing weed as and preventing crop loss by insects.

Post-Development Erosion and Sedimentation results from poor site management practices associated with construction activities and the failure to adequately stabilize a construction site with proper erosion and sediment controls during and subsequent to the completion of development activities. The removal of existing vegetation and the excavation and grading operations associated with site development can result in increased rates and volumes of sediment-laden runoff, resulting in sheet, rill, and gully erosion and the transport of pollutants commonly associated with construction sites, including solid and sanitary wastes, phosphorus, nitrogen, pesticides, oil and grease, concrete truck washout, and construction chemicals and debris via stormwater runoff into nearby waterways.

Residential Districts may be sources of NPS pollutants associated with everyday activities. Residential NPS pollutants may include those associated with property maintenance such as paint, stains, solvents, and cleaning chemicals, lawn and garden chemicals (fertilizer and pesticides), lawn and yard maintenance waste such as grass clippings, leaves and branches, and vehicle maintenance chemicals,

including gasoline, oil, grease, antifreeze, windshield wash fluid, and cleaning chemicals. Other residential NPS pollutants may include nutrients and pathogens from pet waste, pool chemicals, and sediment from bare lawn and garden areas.

Rural (Residential Areas) may contribute the same types of NPS pollutants as residential districts. However, rural residential areas may also contribute pollutants associated with other uses such as livestock (nutrients, pathogens, sediment) and more intensive or widespread agricultural activities (fertilizers, pesticides, and chemicals associated with the use and maintenance of farm equipment). Rural residential areas may also contribute nutrients and pathogens from substandard onsite sewage treatment systems, such as cesspools or older septic systems that do not comply with current design and treatment standards.

Site Clearance (Land Development or Redevelopment) may open substantial areas of land to erosion. The clearing of new land may release nutrients that have been naturally stored in the soil, while redevelopment may expose residential, commercial, or industrial contaminants such as leaked heating oil, commercial chemicals and solvents, and industrial chemicals. The transport of NPS pollutants from land development or redevelopment results from improper use and maintenance of erosion and sediment control practices. These practices are designed to control, capture, and infiltrate stormwater onsite to prevent NPS pollutants from entering nearby waterways.

Unspecified Urban Stormwater Runoff is stormwater from impervious surfaces in urban areas. Runoff from impervious areas includes sidewalks, roads, driveways, parking areas, rooftops, and similar facilities. This includes water that flows on and over buildings, grassed areas, parking lots, and other features found within urban areas. Since water cannot infiltrate into the ground through impervious surfaces, NPS pollutants on these surfaces are washed via rain and snowmelt into storm drains and adjacent waterbodies. Runoff from pervious areas in urban centers, such as lawns and landscaping, parks and recreational areas, and golf courses, also contributes pollutants including fertilizers, pesticides, trash, and other materials such as wastes from domestic animals and urban wildlife. Stormwater runoff from developed areas is also typically warmer than runoff from undeveloped areas and can contribute to thermal impacts to waterbodies.

Within developed areas, storm drains receive runoff from the land, building roofs, pavement, and through infiltration/inflow from groundwater. Street catch basins are often receptacles of accidental and illegal dumping of wastes, including waste oils, and are often repositories for trash that is either intentionally deposited or carried into the catch basin by stormwater. As such, storm drains are a potential conduit for nearly any type of NPS pollutant. Past practices of locating drain outfalls at ponds, streams, and estuaries have resulted in direct contamination of waterbodies with pollutants including heavy metals, sediment, particulates, organic matter, nutrients, and pathogens.

Wastes From Pets in urban, suburban and rural settings can be significant sources of nutrients and pathogens. In urban areas, high levels of impervious surfaces contribute to nutrients and pathogens in stormwater runoff if pet waste (particularly dog waste) isn't picked up and properly disposed of. In suburban and rural areas, pet owners may pick up after pets in public areas but not in their own yards. Additionally, the popularity in recent years of the keeping of livestock such as chickens and goats in suburban and rural residential settings may contribute to increases in pollutants associated with pet waste.

Yard Maintenance, as previously stated, may contribute a variety of NPS pollutants, such as fertilizer and pesticides, nutrients from lawn and yard waste such as compost, grass clippings, leaves and branches, and gasoline, oil, and grease from lawn and yard equipment maintenance.

Septic Systems

Figure 3.23. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS category Septic Systems.*

Subsurface wastewater disposal systems, or septic systems, are intended to treat pathogens in wastewater effluent from homes and businesses in areas that are not served by sewers. Septic systems may treat waste from single or multiple homes or businesses. Septic systems that treat multiple residences or businesses are called cluster (or community) decentralized wastewater treatment systems. Cluster systems collect wastewater from two or more homes or businesses under some form of common ownership and convey wastewater to a treatment and dispersal system located on a suitable site near the dwellings or buildings. Traditional septic systems are composed of septic tanks and leach fields. Properly designed, sited, and maintained septic systems provide effective treatment of pathogens and phosphorus. Nitrogen, due to its high solubility in water, is less effectively treated by traditional septic systems, although innovative and alternative (I/A) systems provide advanced nitrogen removal treatment. Achieving optimal nitrogen removal is especially important in coastal areas of Massachusetts, as nitrogen is a cause of severe water quality degradation in marine environments.

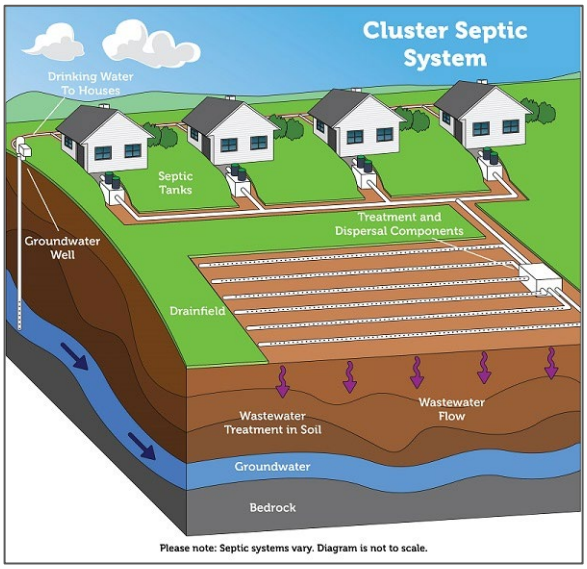


Figure 3.24. *Example of a cluster septic system. Graphic source: USEPA.*

Septic systems can be sources of pathogens, and to a lesser degree, chloride and CECs such as PFAS, pharmaceuticals, and microplastics. Pathogen contamination can occur due to malfunctioning or under-functioning septic systems. System failures caused by hydraulic overloading, improper operation, or poor design may result in above-ground breakouts of untreated leachate that may contaminate surface and groundwater, as well as nearby drinking water wells. Septic systems can be a source of chloride from water softener system discharge, human excrement, household cleaning products and personal care products. Many common household products including cleaning products, shampoo, toothpaste and mouthwash, make-up and other personal care products contain sodium chloride that is discharged to septic systems or sewers when we clean, wash, or bathe. Septic systems are not designed to treat chloride or CECs such as PFAS, pharmaceuticals, and microplastics. As a result, these compounds can leach into groundwater and be discharged into surface waters via groundwater.

Commercially sold septic tank additives, disposal of pharmaceuticals, and introduction of other improper materials can be a source of toxic organic compounds that are not treated by the system and can cause catastrophic system failure. Failure to provide proper maintenance of a septic system, including regular inspections, holding tank maintenance, and proper care and maintenance of the leach field can cause septic system failure.

Agriculture

Figure 3.25. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Agriculture.*

Agriculture can be a significant source of NPS pollutants including nutrients, pathogens, and sediment. Agriculture encompasses activities that occur on land and in water that focus on the production of crops and livestock, as well as the storage, management, and use of fertilizer and animal waste products. Agriculture broadly encompasses cranberry bogs, cornfields, orchards, greenhouses, vegetable production, confined animal operations (feedlots), and shellfish beds. According to the Massachusetts Department of Agriculture, greenhouse and nursery crops constitute greater than one-quarter of the state's total agricultural production, followed by fruit, nuts and berries, and vegetables[2]. Although not commercial in nature, small hobby farms, horse stables, home gardens, and similar small-scale activities also generate nutrients, pathogens, pesticides, and sediment. Some NPS pollution from agriculture comes from the unintentional misuse or inappropriate application of pesticides, fertilizer and manure. Animal husbandry practices, particularly the collection and management of manure and the management of barnyard runoff, also influence NPS pollution. Rototilling and traditional tillage can be significant sources of sediment from stormwater runoff. Increased rainfall frequency and intensity, warmer temperatures, and longer growing seasons resulting from changes in the climate due to global warming may exacerbate NPS pollution associated with agricultural activities.

Within the agriculture NPS category, subcategories of NPS pollution are depicted in Figure 3.25.

Agricultural croplands contribute the majority of agriculture-related NPS pollution in Massachusetts. Croplands are sources of surface and groundwater contamination from a variety of pollutants including nutrients, pathogens, and sediment. Nutrient contamination may result from the over-application of inorganic and organic (manure, compost, biosolids, etc.) fertilizers, applications at the wrong time of the growing season, or applications just before rainfall. Inorganic (chemical) fertilizers may contain highly water-soluble nitrogen compounds that have the potential to leach to groundwater. Less water-soluble

Figure 3.26. *Row crops may be sources of multiple NPS pollutants, including nutrients, sediment, and pesticides.*

[2] Massachusetts Department of Agricultural Resources Agricultural Resources Facts and Statistics 2022 Census https://www.mass.gov/info-details/agricultural-resources-facts-and-statistics.

nitrogen compounds are subject to surface runoff into surface waterbodies. Phosphorus in fertilizer readily binds to sediment and can be transported into waterways by stormwater runoff. In addition to being a source of nutrients, municipal wastewater treatment biosolids or composted green waste applied to croplands as fertilizer can be a source of other types of potential pollutants. For example, biosolids may contain substances that are not removed by traditional wastewater treatment processes and not typically monitored, such as per- and polyfluoroalkyl substances (PFAS) or pharmaceutical wastes. Subsurface drainage, such as field tiles, can enhance the transport of concentrated NPS pollutants to both surface and groundwater.

Pathogen contamination may result from runoff from manure in solid or slurry form that is spread on croplands to fertilize crops. Foraging by wildlife such as deer, turkeys, and migratory waterfowl in crop fields can also contribute substantial amounts pathogens via their feces.

Lastly, cropland is subject to sheet, rill, and gully erosion when surface runoff is not properly managed, resulting in sediment deposition and loading of associated pollutants to adjacent waterbodies. Wind erosion from bare soil can also lead to sediment deposition in surface waters. Cropland that receives water through ditch irrigation or other watering systems is more vulnerable to erosion and runoff of chemicals and nutrients. Excess water that cannot be used by plants or absorbed into soil can transport NPS pollutants to surface waters.

Timber harvesting is an agricultural activity that focuses on the management of forested areas for the purpose of planting and harvesting trees for timber and other associated wood products. While forestry activities are minimal in the coastal zone, both public and private lands in the western portions of Massachusetts are managed for forestry.

Within this category, possible pathways for NPS pollution to enter surface and groundwater include timber harvesting, reforestation, and the planting of Christmas tree plantations. Activities associated with cutting and removing timber can cause increased soil erosion. Access and skid roads, stream crossings, and log landings are the primary sources. Increased erosion can result in suspended or bed load sediments in streams, ponds, reservoirs, and lakes. Clear-cutting or patch-cutting large areas may result in hydrologic modifications that could cause accelerated channel or sheet erosion. Site preparation associated with reforestation may result in the temporary loss of cover and result in sheet and rill erosion. Christmas tree plantation site preparation may result in accelerated sheet and rill erosion and subsequent soil erosion.

In Massachusetts, potential NPS pollution impacts associated with forestry are primarily addressed through continued implementation of the Massachusetts Forest Cutting Practices Act and its coordination with Wetlands Protection Program performance standards, and pro-active education on efforts such as forestry BMPs. The Massachusetts Department of Conservation and Recreation (DCR) Forest Stewardship Program exists to offer technical assistance and outreach efforts to the forest cutting community.

Animal feeding operations (NPS) are feedlots where large amounts of animals or wastes are concentrated, which may result in the direct runoff of nutrients, bacteria and other pollutants including veterinary pharmaceuticals into surface waters. Livestock holding areas, manure piles, and manure storage lagoons where large amounts of animals or animal waste are concentrated may pose a particular threat to surface and groundwater. These threats are magnified if they are in close proximity to, or drain into conduits that discharge to, surface waterbodies. Significant groundwater impacts from animal feedlots and animal waste storage areas are also possible where the water table is high or where soil infiltration rates are high. This subcategory excludes confined animal feeding lots (CAFOs), which are regulated under the NPDES permit program.

Animal holding/management areas: Barnyards and animal confinement and management areas, including milking parlors, runout barns, and turnout areas, can be sources of nutrients, pathogens, pharmaceuticals, animal care products, and sediment from erosion. These areas often become de-vegetated due to farm equipment traffic, trampling, or overgrazing making them vulnerable to runoff from barn roofs and other impervious surfaces. Barnyards may also be sources of hydrocarbons and other chemicals from farm equipment maintenance. Processing areas such as milking parlors and food production facilities may be sources of wash and processing. Milking parlor, egg, and vegetable cleaning and processing wash water can contaminate surface water or groundwater with nutrients, pathogens, and cleaning agents when not properly treated or managed.

Animal Shows and Racetracks concentrate animals onto relatively small areas of land and can be sources of nutrients, pathogens, animal care products, pharmaceuticals, and sediment. Animal show facilities are typically used intermittently and for short periods of time (typically 1 to 2 days); however, racetracks may be occupied for longer periods of time, which can result in the concentration of large amounts of animal waste that may pose a threat to surface and groundwater.

Aquaculture (permitted), also known as fish or shellfish farming (in compliance with local and state regulations), refers to the breeding, rearing, and harvesting of plants and animals in all types of water

environments, including ponds, rivers, lakes, estuaries, and the ocean. It produces food fish, sport fish, baitfish, ornamental fish, crustaceans, mollusks, algae, sea vegetables, and fish eggs. Aquaculture includes the production of seafood from hatchery fish and shellfish that are grown to market size in ponds, tanks, cages, or raceways. This category also includes the growing of aquatic plants used in a range of food, pharmaceutical, nutritional, and biotechnology products. These operations have the potential to cause NPS pollution from nutrients (typically from excess food or nutrient supplements that break down in water) and waste products from aquatic biota.

Dairies, like animal feeding operations and animal holding and management areas, concentrate large numbers of cattle in a relatively confined area. This can result in the concentration of animal waste, which can contribute to nutrient, pathogen, and pharmaceutical pollution. Animal mortality can also contribute to NPS pollution if not properly managed. The improper storage and management of silage, a type of dairy animal feed made from corn and hay, can result in silage leachate, a highly acidic, nutrient-rich liquid that seeps from silage storage areas. As previously mentioned, milking parlor and milk processing room wastewater and wash water can contaminate surface water or groundwater if not properly treated or managed.

Grazing in riparian or shoreline zones may result in soil erosion and streambank instability from overgrazing, the removal or destruction of riparian vegetation, and trampling caused by animals accessing the water to drink. Additionally, nutrients and pathogens from the urine and manure of animals grazing in riparian or shoreline areas may be easily transported into waterways via stormwater runoff.

Livestock (grazing or feeding operations): Pasture and grazing lands may be sources of nutrients, pathogens, and sediment. Nutrients and pathogens from the urine and manure of grazing livestock may be transported into waterways via stormwater runoff or directly deposited if animals are allowed access to surface waters for watering. The overstocking of pastureland may result in the deposition of excess urine and manure as well as the loss of vegetation, resulting in soil erosion.

Pesticide application involves the use of products that are used to control a wide variety of pests including insects, fungi, and undesirable plants. If not properly applied and stored, excess chemicals can be carried into surface water and groundwater from rain or irrigation. Pesticides have the potential to

contaminate surface waters from erosion in the same manner as nutrients. The improper disposal of wash or rinse water from the cleaning of pesticide spraying equipment is another potential source of pesticide contamination. Water used to clean the inside of spray tanks or equipment is often drained in a small land area that may lead to groundwater contamination.

Specialty crop production includes the cultivation of fruits, vegetables, nuts, and horticulture and nursery crops, including floriculture. Specialty crop production may require the use of specific chemicals to protect and ensure a successful crop, including fertilizer, pesticides, herbicides, and fungicides. Improper use and application of these chemicals can result in NPS pollution.

Cranberry production is a prime example of a specialty crop that may have direct impacts on surface waters. Due to the required cultural practices for growing cranberries, large amounts of water are used for irrigation, crop frost protection, and harvesting. The water used in cranberry bogs is typically obtained from nearby surface waters. This water is normally drawn from the surface waterbody, used and retained as required, and returned to the waterbody. Excessive or improper application of fertilizers and pesticides, as well as :accidents and vandalism, may result in direct introduction of pesticides and fertilizer to adjacent surface waters. Another potential impact on surface water may result from the aerial application of pesticides to cranberry bogs. Due to the close proximity of cranberry bogs and surface waters, pesticide drift may occur and result in direct input of low levels of pesticides to surface waters.

Figure 3.27. *Cranberry bog. Image source: Massachusetts Division of Ecological Restoration.*

Unrestricted cattle access, as with the grazing in riparian or shoreline zones subcategory, may result in soil erosion and streambank instability, the removal or destruction of riparian vegetation, and trampling caused by animals accessing the water to drink. Additionally, nutrients and pathogens from the urine and manure of animals grazing in riparian or shoreline areas may be easily transported into waterways via stormwater runoff or directly deposited by animals standing in the water.

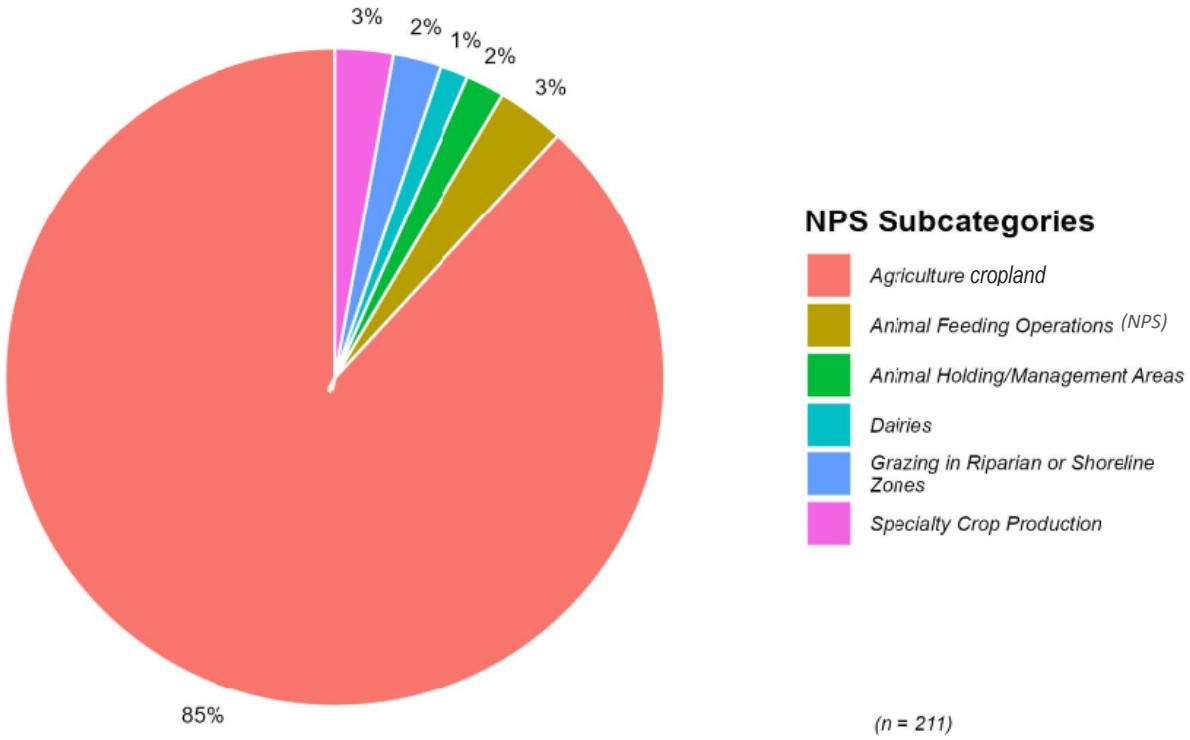


Figure 3.28. *NPS Impairments from Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Agriculture. The figure includes the number of ATTAINS assessment records for these categories ("n").*

3.5.2 Massachusetts Minor Primary NPS Categories

Minor Primary NPS categories are those categories depicted in Figure 3.18 that comprise less than 10% of impaired waters. The Massachusetts NPS categories and subcategories are identified in Figure 3.17. The Minor Primary NPS categories and their associated pollutants are depicted in Figure 3.29 and are described in the sections below.

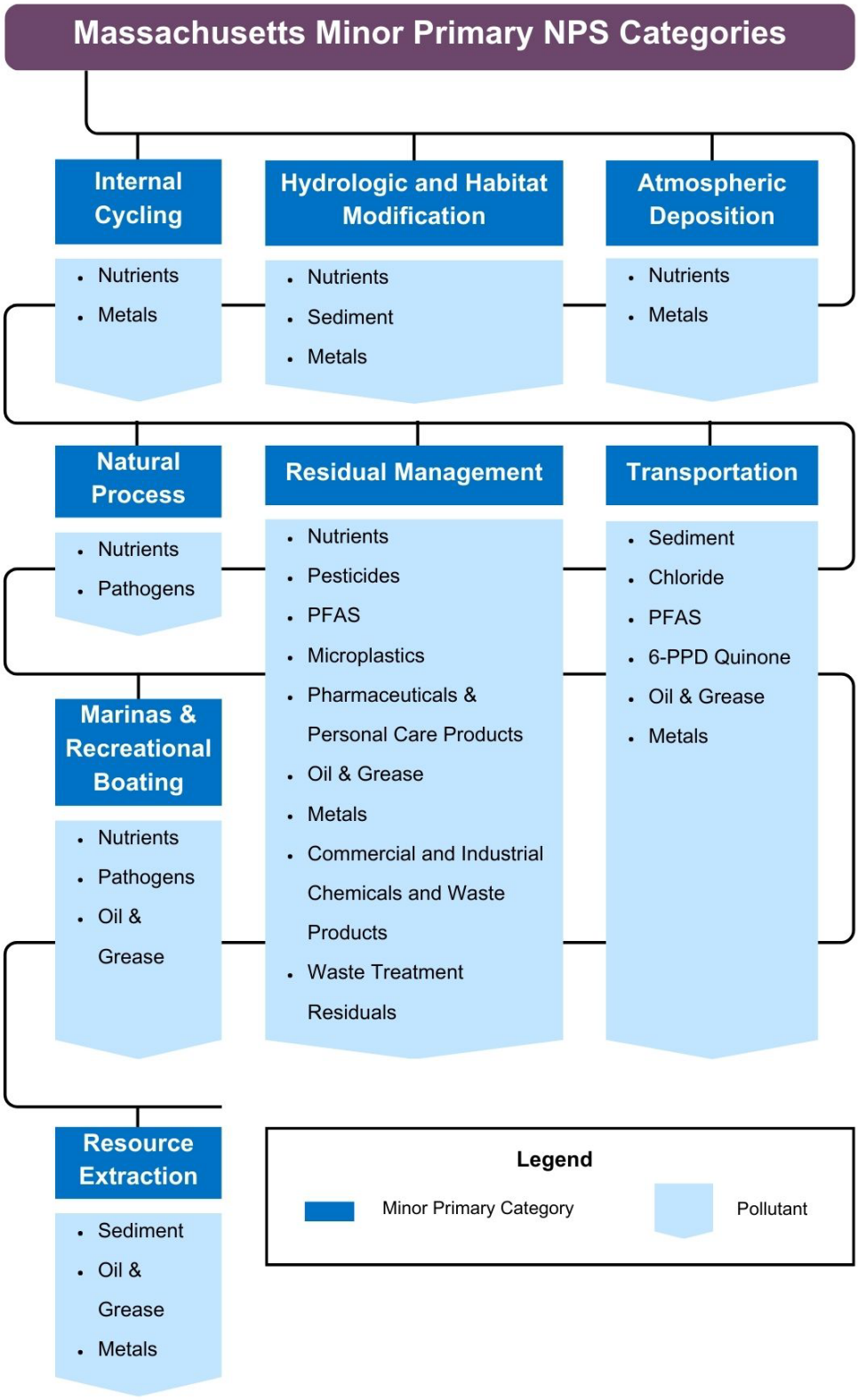


Figure 3.29. *Massachusetts ATTAINS Minor Primary NPS categories and their associated pollutants.*

Hydrologic and Habitat Modification

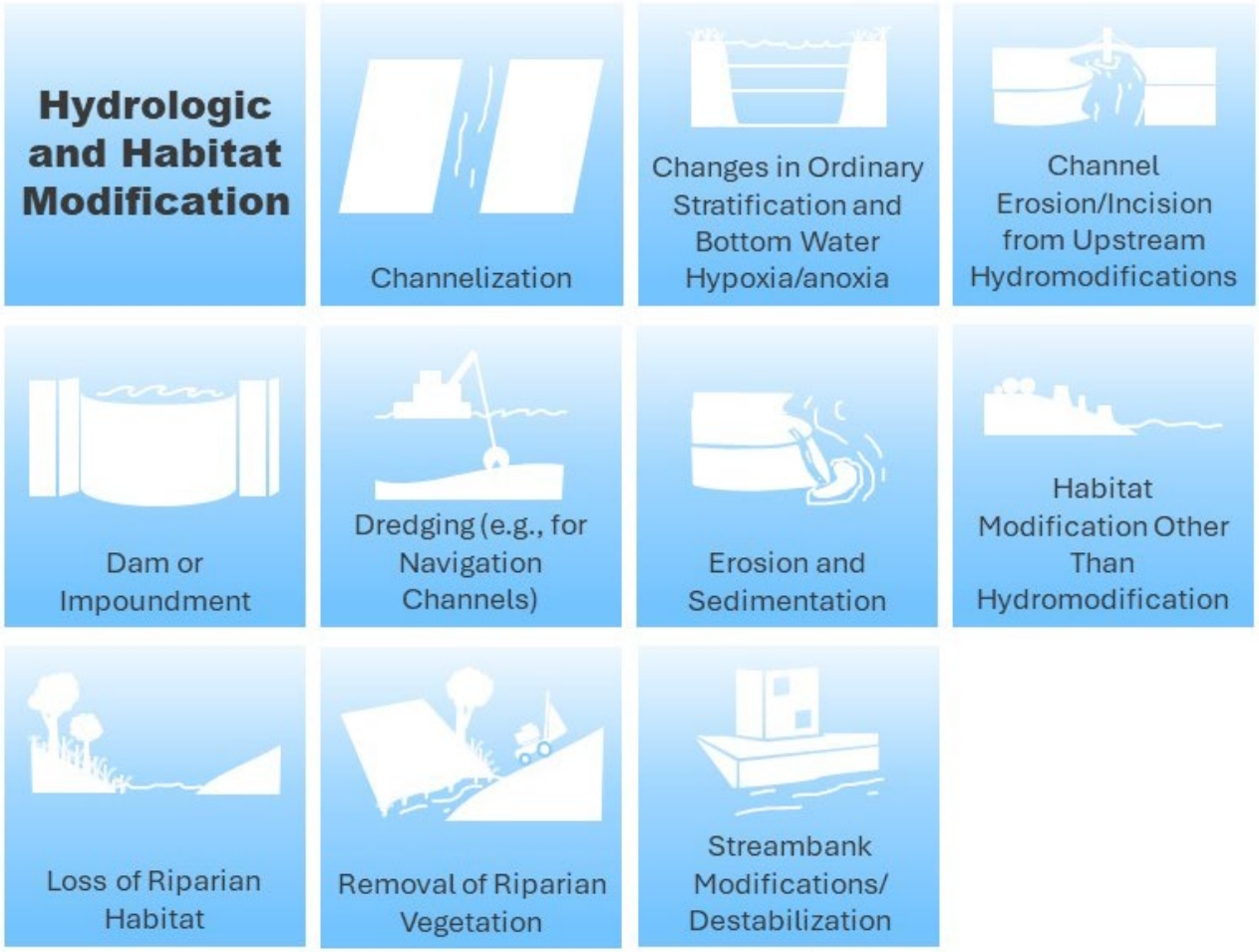


Figure 3.30. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Hydrologic and Habitat Modification.*

This category includes any anthropogenic (human-caused) alteration of the bed, banks, flow path, bottom depth, velocity, water volume, or water regime of a river, lake, stream, shoreline, or wetland. Historically, waterbodies have been reshaped for a variety of purposes, such as enhancing water supplies, flood control, drainage, and creation of areas to construct roads, buildings, and other structures. Massachusetts has more than 3,000 dams, with the Blackstone watershed having the highest dam density in the country. These alterations have adverse effects on water quality and watershed stability, most often resulting in destabilized stream channels, and displacement of water from wetlands filled or drained. Interference with natural channel process and hydrologic function contributes to erosion and sedimentation and leaves the watershed vulnerable to the impacts of climate change. A summary of ATTAINS sources

associated with Massachusetts NPS subcategories of Hydrologic and Habitat Modification is provided in Figure 3.30. Hydrologic and habitat modification may have many impacts on aquatic systems that result in NPS pollution. Pathways for NPS pollution within this category are described below.

A variety of hydrologic and habitat modification activities can alter and destabilize stream channels and impact water quality and aquatic habitat. **Channelization,** the construction or maintenance of ditches, channels, rivers, or alteration of natural channels to redirect flow, may result in direct discharges of soil and sediment to flowing waters during construction. Unstable channels, eroding slopes, and unstabilized spoil material may erode, releasing sediment to water. Channelization may contribute to bank and substrate erosion due to increased water velocities resulting from the channelization process. The removal of riparian vegetation as part of the channelization process may result in temperature increases in downstream areas, and contribute to stream scouring, increased flows, and flooding. **Channel erosion/incision from upstream hydromodifications** such as channelization, dredging, or installation of impoundments can result in the degradation of aquatic habitat from erosion and the downstream deposition of eroded materials. **Dam or impoundment** construction and removal may result in soil erosion and sediment delivery to waters. Thermal and hydrologic modifications frequently occur where the reservoir area or storage is large. Flooding of upstream wetlands after dam construction may result in alterations in the pH of waters and the release of nutrients. Additionally, earthwork dams may contribute sediments from erosion or failures. **Dredging (e.g., for navigation channels)** may release sediment that can degrade downstream channel morphology and habitat and release nutrients, metals, and other contaminants that were bound in the substrate. **Streambank modifications/destabilization** may include the installation of bank stabilization techniques involving hard armoring that may enhance bank erosion upstream and downstream of the armored area due to increased water velocity or changes to the natural flow of water through a stream or river. The **removal of riparian vegetation** and **loss of riparian habitat** may destabilize stream banks and lakeshores and contribute to erosion and sedimentation to adjacent waterbodies. This type of erosion can result from enhanced or unnatural stream flows or increased wave action from watercraft.

Figure 3.31. *Sedimentation in a stream subsequent to the removal of a dam. Photo: MassDEP.*

Habitat modification – other than hydromodification may include changes in shoreline habitat such as the conversion of forested streambanks or shorelines to lawn. This type of habitat modification impacts

the capacity of the stream bank to withstand erosion and may contribute to sedimentation in the waterbody. Habitat modification may also result from accidental or intentional changes to the habitat such as the removal or introduction of certain plant or animal species that changes the character of the habitat, such as the removal of eelgrass or the introduction of invasive aquatic plants. **Erosion and sedimentation** from terrestrial activities such as land clearing for development, mining, lack of or inadequate vegetated buffers, or tree harvesting, especially if erosion and sediment control practices are not utilized, can result in erosion and the deposition of sediment in nearby waterbodies. Likewise, the erosion of unstabilized stockpiled materials and fill may cause sedimentation in streams and lakes. Finally, **changes in ordinary stratification and bottom water hypoxia/anoxia** can result in the release of phosphorus and certain metals, including iron and manganese, into the water column. The release of these elements can drive the growth of phytoplankton and macrophytes, resulting in excessive aquatic plant growth, algae, and cyanobacteria blooms. Anoxic conditions resulting from water column stratification can result in the death of aquatic organisms and the destruction of aquatic habitat.

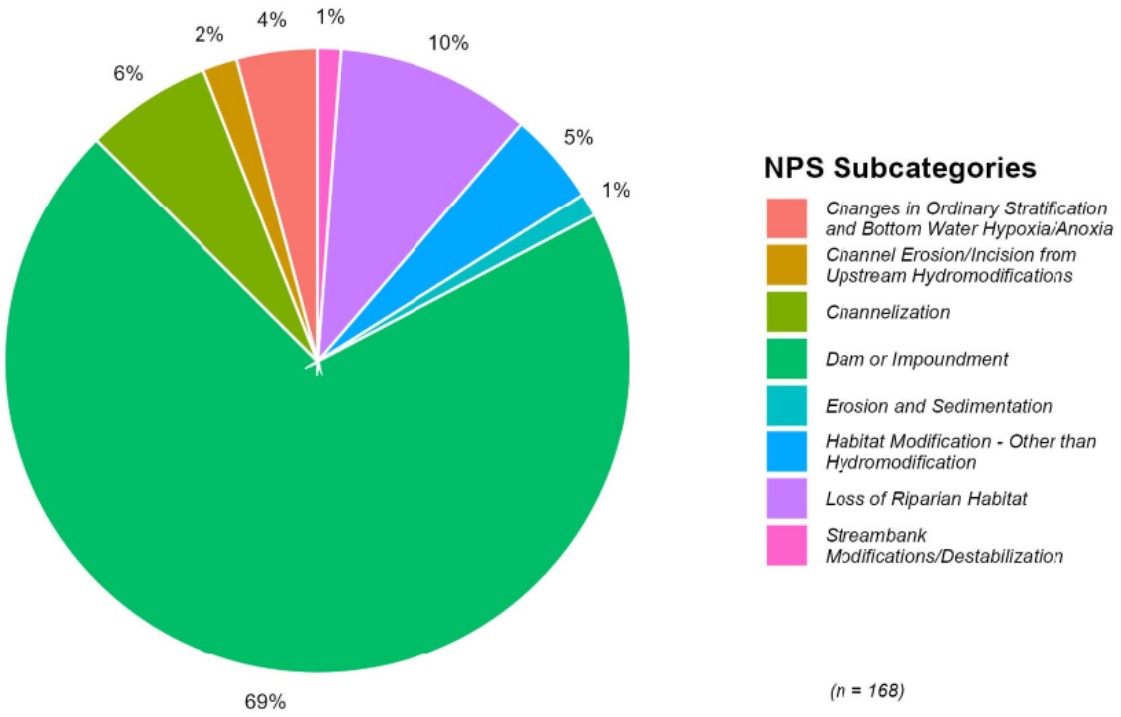


Figure 3.32. *NPS impairments from Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Hydrologic and Habitat Modification. The figure includes the number of ATTAINS assessment records for these categories ("n").*

Internal Cycling

Figure 3.33. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Internal Cycling.*

Internal pollutant cycling refers to the process by which pollutants such as nutrients and metals are alternately bound or released from aquatic sediments. For example, phosphorus readily binds with sediment in oxygen-rich environments. However, in oxygen-poor environments, such as a stratified lake bottom, phosphorus is released, where it can lead to algal blooms and excessive plant growth. More problematic is arsenic, a toxic metal that, like phosphorus, can be released into water under anoxic conditions.

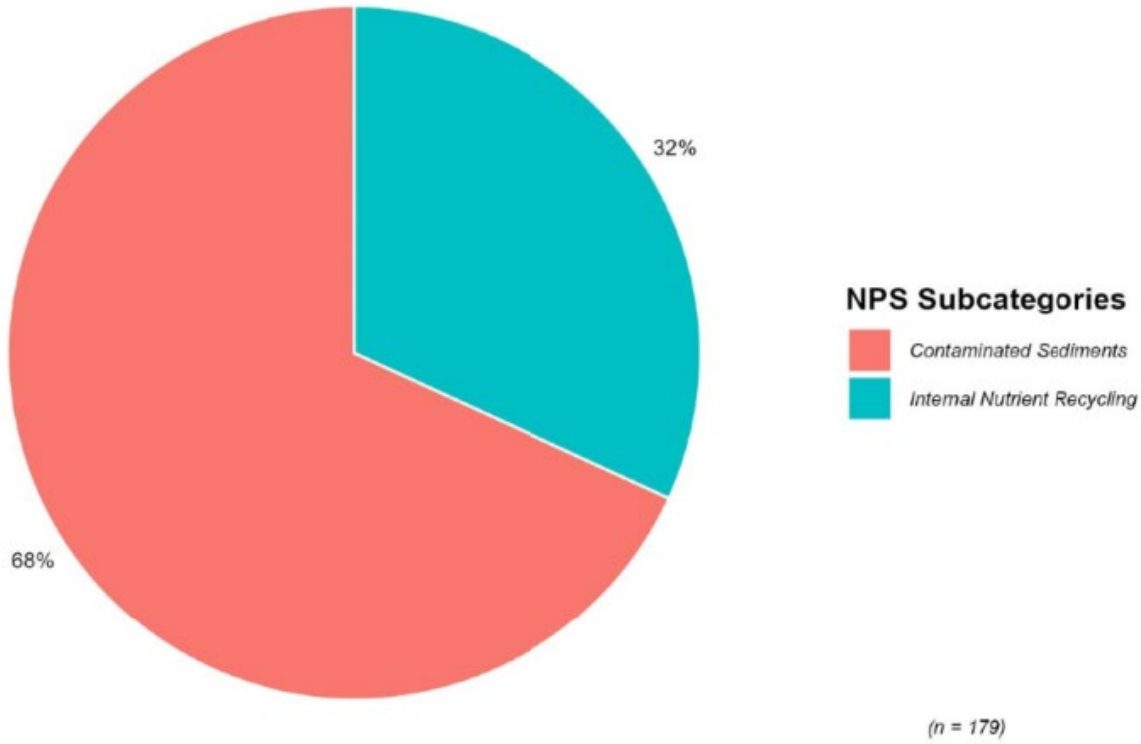


Figure 3.34. *NPS impairments from Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS category of Internal Pollutant Cycling. The figure includes the number of ATTAINS assessment records for these categories ("n").*

Transportation

Figure 3.35. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Transportation.*

Chloride contamination can be exacerbated by poor salt storage and application practices, as well as equipment maintenance. The over-application of salt, especially on stairs, walkways, and parking lots to prevent slips and falls, is a common cause of chloride pollution. Poor equipment maintenance, such as the calibration of salt applicators, can also result in the over-application of salt. Poor salt storage practices, such as not properly storing salt or not covering salt piles, can result in salt being conveyed in runoff into nearby waters and soaking into the soil where it can enter groundwater.

Unimproved roads may be sources of sediment and dust. In addition, tackifiers and related compounds can be washed off roads or shoulders during rainfall events. Oil, grease, and fuel from railroads are potential sources of NPS pollution. Additionally, areas where bulk or liquid materials are loaded/unloaded from railcars can be sources of a variety of NPS pollutants. Aviation chemicals associated with aircraft

maintenance and deicing are sources of NPS pollutants. Chemicals used to fight aviation fires contain PFAS, which are a class of chemicals of emerging concern.

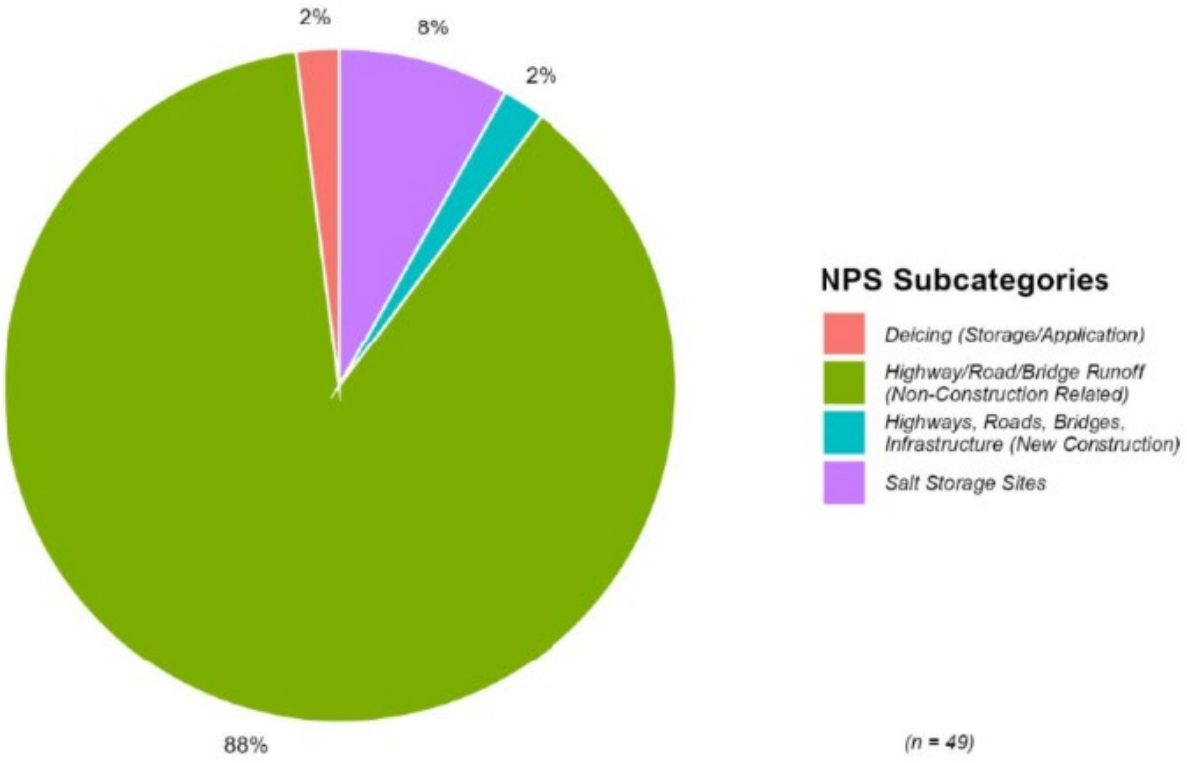


Figure 3.36. *NPS impairments from Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Transportation. The figure includes the number of ATTAINS assessment records for these categories ("n").*

Marinas and Recreational Boating

Figure 3.37. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS category Marinas and Recreational Boating.*

Marinas, recreational boating, and commercial fisheries are unique sources of NPS pollution. Commercial marinas, recreational boat mooring and fleeting facilities can be sources of chemicals used on boats, such as detergents and cleansers from boat washing that may contain orthophosphates, a form of phosphorus. Boat maintenance, repair, and fueling are also potential sources of NPS pollution, as can be fleeting facilities where bulk or liquid materials are loaded or unloaded. Marinas may also be sources of nutrients and pathogens from accidental spills from sewage waste pumping. Further, the illegal discharge of boat sewage and waste can contribute to nutrient and pathogen pollution.

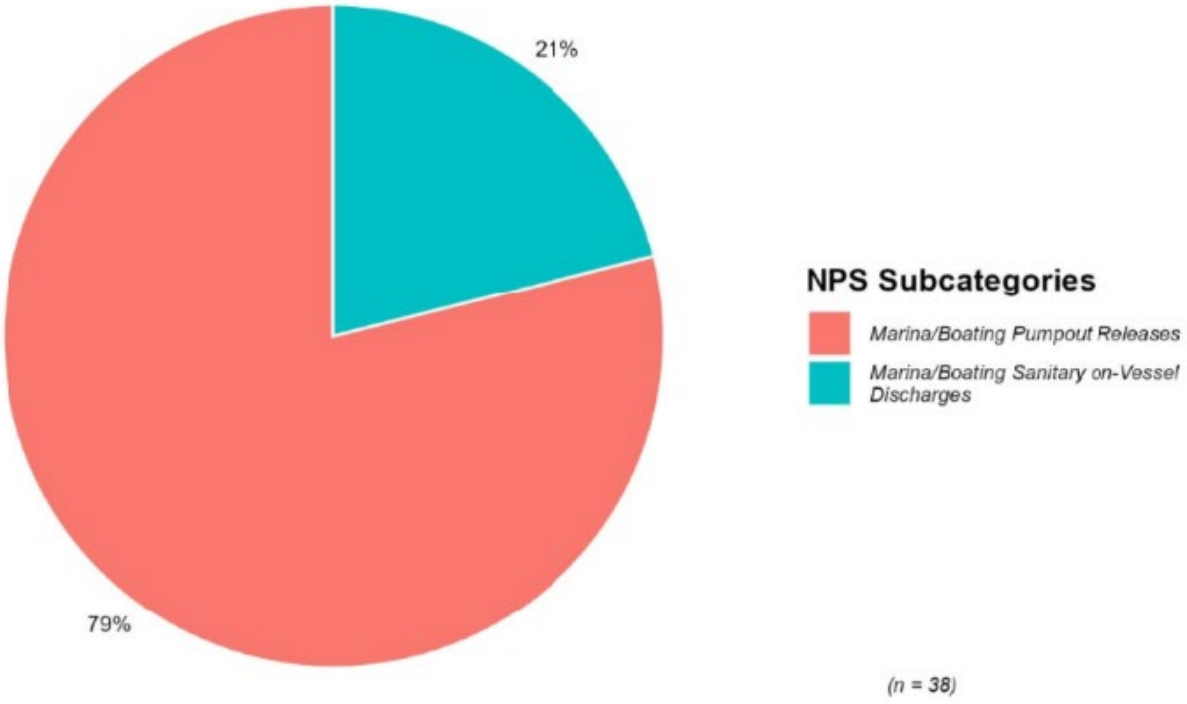


Figure 3.38. *NPS impairments from Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS category Marinas and Recreational Boating. The figure includes the number of ATTAINS assessment records for these categories ("n").*

Resource Extraction

Figure 3.39. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS category Resource Extraction.*

This category includes activities dedicated to the recovery of sand, gravel, rock, oil, natural gas, and other natural materials that are obtained by excavation, drilling, boring, or other methods.

Within this category, possible pathways for NPS pollution to enter surface and groundwater include surface extraction areas and processing facilities. Surface extraction areas are gravel pits, surface mines, and similar areas. Exposed soil and mineral resources are subject to wind and water erosion. Both surface and groundwater hydrology may be altered due to these land use changes. Activities at processing facilities such as sorting, washing, and other processing facilities or storage of extracted and waste resources may contribute dust and solids to nearby waterways.

In Massachusetts, potential NPS pollution impacts associated with natural resource extraction are primarily addressed through implementation of CWA s.401, s.402, and s.404. In addition, municipalities may enact local bylaws to further control potential impacts associated with natural resource extraction.

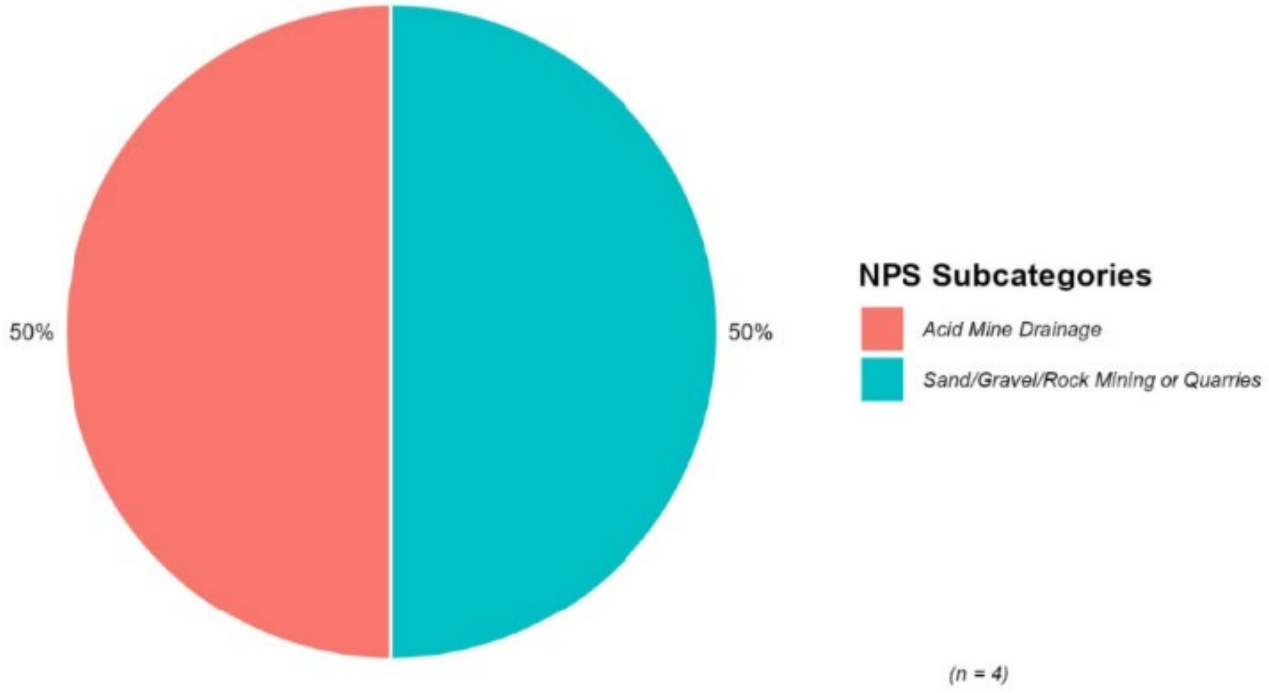


Figure 3.40. *NPS impairments from Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Resource Extraction. The figure includes the number of ATTAINS assessment records for these categories ("n").*

Natural Process

Figure 3.41. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Natural Process.*

Nonpoint sources associated with the Natural Process category are wildlife and waterfowl. These sources are typically considered natural or background levels, unless it can be demonstrated that animal populations exceed what would be considered typical or normal. NPS pollutants associated with the Natural Process category include nutrients and pathogens from animal feces.

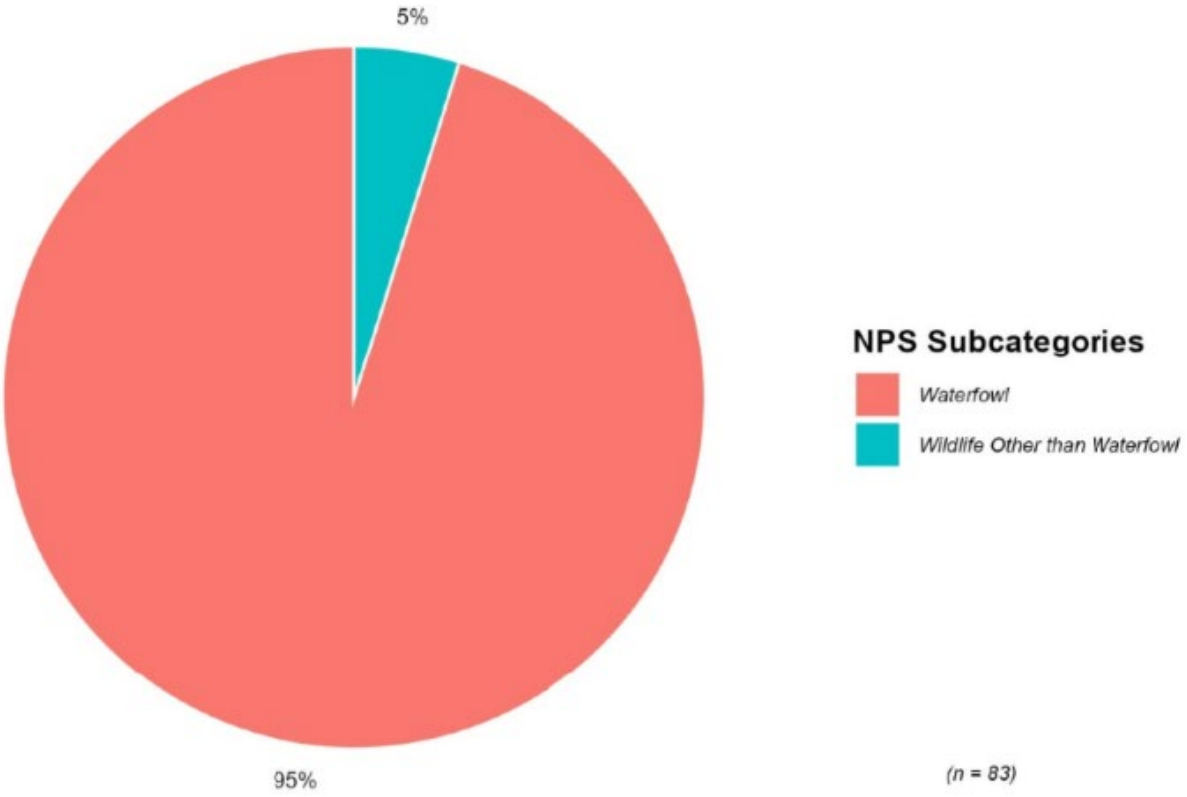


Figure 3.42. *NPS impairments from Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Natural Process. The figure includes the number of ATTAINS assessment records for these categories ("n").*

Residuals Management

Figure 3.43. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Residuals Management.*

Residuals are the end products of various types of waste treatment processes. Residuals management includes activities related to consolidation and management of wastes generated by residential, commercial, and industrial processes. Many of these activities are regulated, and extensive requirements are typically placed on these sites. However, the potential for offsite transport and illegal disposal of NPS pollutants remains, as does the potential for better management with improved BMPs. Within ATTAINS, NPS subcategories of residual management include discharges from biosolids (sludge) storage, application or disposal; illegal dumps or other inappropriate waste disposal; septage disposal; and unpermitted discharge (domestic wastes).

Biosolids are a product of the wastewater treatment process. Solids, or sewage sludge, are separated from liquids during the waste treatment process and are treated to produce a nutrient-rich semisolid. **Discharges from biosolids (sludge) storage, application or disposal** may contain a variety of pollutants. More than 700 chemicals have been identified in biosolids, including heavy metals, pesticides,

drugs, cosmetics, and flame retardants. Because they are nutrient-rich, biosolids have been used as fertilizer in agricultural, residential and land reclamation applications. Runoff and leachate from the storage, application, or disposal of biosolids may contain constituent chemicals from these substances.

Illegal dumps or other inappropriate waste disposal result from efforts to avoid the proper disposal of household or other types of waste, such as construction debris. Illegal dumps may contain a variety of NPS pollutants such as household chemicals, cleaning agents, paints, solvents, oil, grease, and domestic trash and debris. Inappropriate waste disposal may encompass the illegal discharge of a variety of wastes such as milk room wastes, produce cleaning waste, manure lagoon effluent, and liquefied manures. There is the potential for contamination by runoff and/or infiltration of nutrients, bacteria, and chemicals from these wastes. Despite numerous benefits as a practice to reduce waste and landfilling, land areas used for the composting of agricultural, industrial, and residential wastes may represent another potential source of pollution. The degree of potential contamination is difficult to determine since the threat is based on the types of materials that are being composted and the site-specific composting procedures. Materials that contain high levels of nutrients and that are exposed to rain represent an increased risk to groundwater or runoff to surface waters.

Septage disposal, particularly the collection and transportation of septage waste from septic system holding tanks and other sources may present a potential for surface and groundwater contamination. Septage waste is typically transported to treatment plants for proper disposal, but accidental spills may occur, resulting in waste soaking into the ground or being transported by stormwater runoff into nearby waterbodies. Septage waste is high in nitrogen and may also contain contaminants such as cleaning chemicals, personal care products, and pharmaceuticals, which may be discharged to ground and surface waters if leaks or spills occur.

Unpermitted domestic waste discharges may include septic waste that is not properly treated by an onsite wastewater disposal system or grey water from washing machines and dishwashers. These types of waste discharges may include nutrients, pathogens, and household contaminants such as pharmaceuticals, surfactants and other cleaning agents, microplastics, PFAS, and other pollutants.

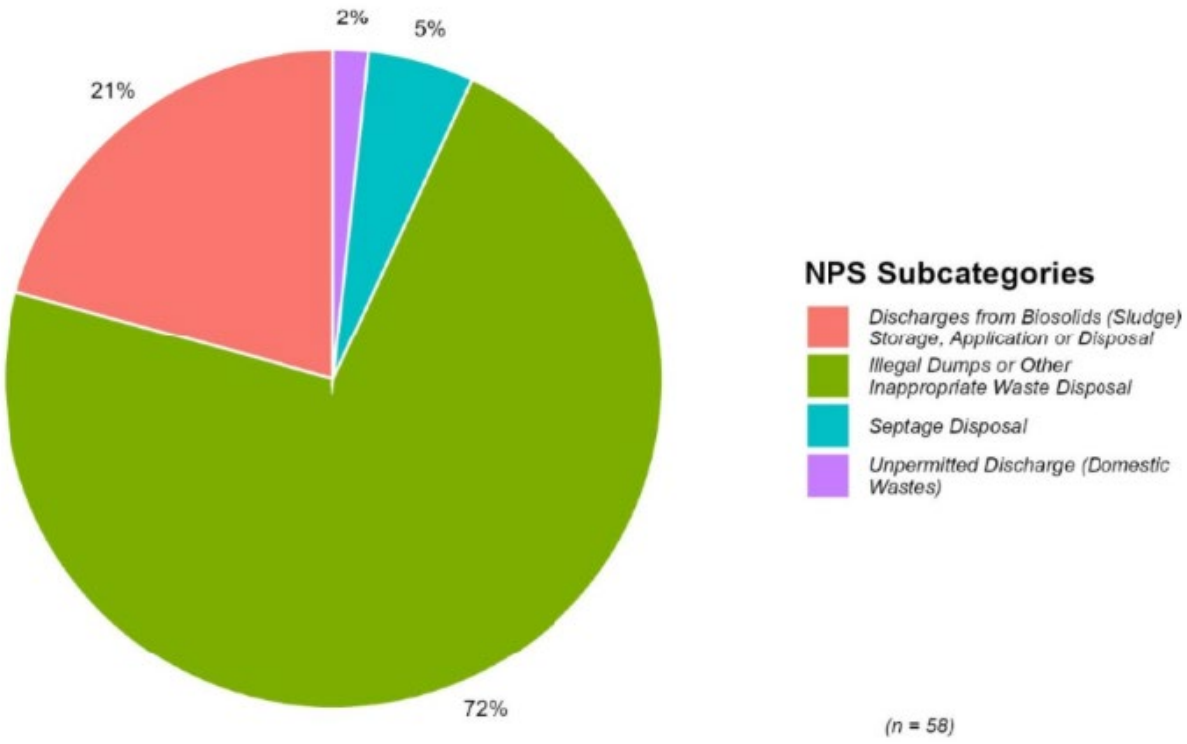


Figure 3.44. *NPS impairments from Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Residuals Management. "n" equals the number of assessment records in the ATTAINS Residuals Management category.*

Atmospheric Deposition

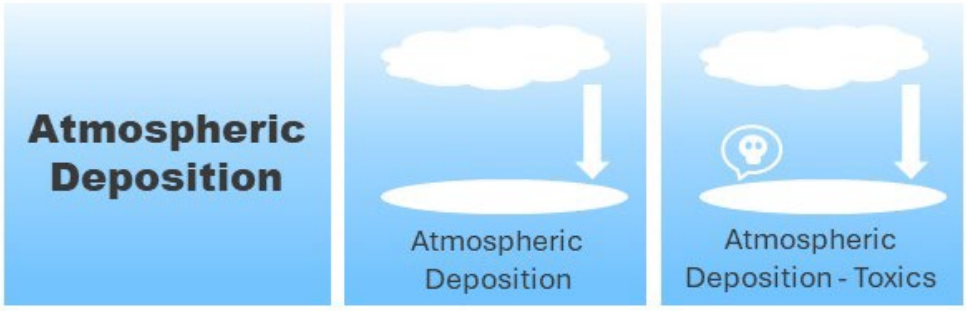


Figure 3.45. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Atmospheric Deposition.*

This category includes a wide range of activities that cause or contribute to the release of pollutants to the atmosphere. These pollutants eventually return to the ground, at often great distances from the original source. The atmosphere is a significant source of pollution to surface water, demonstrated by the impacts of acid rain (sulfur dioxide and nitrogen oxides: SO_2 and NO_x) on lakes, which can cause nutrient impairment. Airborne pollutants are not only deposited directly to surface waters but are deposited to the surrounding land and then additionally enter surface waters indirectly through stormwater runoff and groundwater seepage. Two major issues arise from atmospheric deposition: precipitation containing NPS pollutants and precipitation that leads to surface runoff containing air-deposited pollutants. Addressing these pollutants at the source, typically through existing regulations, and using alternative energy technology can significantly reduce atmospheric NPS pollution.

Figure 3.46. *Atmospheric discharge from an industrial facility.*

Pollutant pathways include wet deposition, dry deposition, and volatilization. Wet deposition occurs when atmospheric pollutants are picked up by precipitation or act as condensation nuclei for precipitation formation and are thereby deposited to surface water and land in the form of rain or snow. Dry deposition occurs when particles in the air are deposited onto surface water and land surfaces at a rate that depends on the particle size, wind speed, and other factors. Gaseous pollutants can also be deposited to water and land. Volatilization is when previously deposited gaseous and semi-volatile chemicals, are re-emitted to the atmosphere as the result of many factors, including chemical reactions and changes in temperature or wind speed.

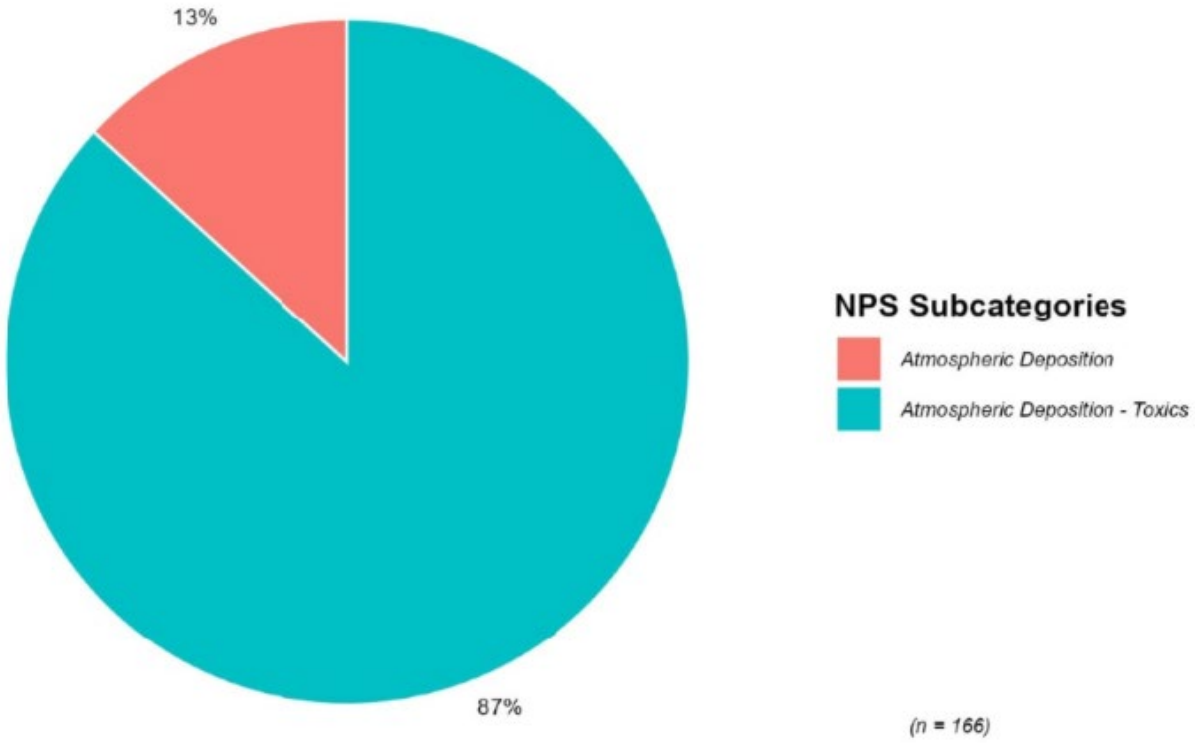


Figure 3.47. *NPS impairments from Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Atmospheric Deposition. The figure includes the number of ATTAINS assessment records for these categories ("n").*

3.6 MASSACHUSETTS MIXED SOURCES CATEGORIES

Figure 3.48. *Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Mixed Sources.*

Pollutants from the Mixed Sources category may come from point or nonpoint sources. Many of these sources, such as brownfields and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites (also known as superfund sites), are regulated but may also have an NPS component. Therefore, they are not differentiated in ATTAINS. Mixed Source categories include Accidental/Incidental/ Illicit discharges; Brownfield/Superfund sites; Brownfield/Superfund, Residual Management and Developed Land; Developed Land; Groundwater; and Hydrologic/Habitat Modification.

Accidental or Incidental discharges may occur during the transport or transfer of chemicals and materials, resulting in small amounts of material being discharged onto the ground. These spilled materials may either soak into the ground or be conveyed via stormwater runoff or snowmelt into nearby waterways. **Illicit discharges** are discharges to a municipal storm sewer system that are not composed entirely of stormwater.

Brownfields are properties whose expansion, redevelopment, or reuse may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Contamination of soils, surface water and groundwater may result from runoff or percolation of water through the area, albeit at lower levels than at a site contaminated with a classified hazardous waste.

Superfund sites are locations that are contaminated with hazardous materials and require long-term cleanups. Superfund sites may be located over defined or non-defined areas where hazardous wastes of chemical, biological, or mineral material are stored, has been stored, or has been land applied. Contamination of soils and surface and groundwater may result from runoff or percolation of water through the area.

Landfills fall under the Brownfield/Superfund category and include both operating and closed landfills that are or have been used for disposal of garbage and other residential, commercial, and industrial wastes considered non-hazardous material. Surface runoff from these areas may contribute sediment to nearby waters and transport a variety of contaminants washed from the material. The decomposition of these wastes generates large volumes of liquids (leachate), which mix with other accumulated depositions to form a variety of potentially harmful compounds that may percolate into surface and subsurface waters.

As discussed in the previous section, **Residuals Management** includes activities related to consolidation and management of wastes generated by residential, commercial, and industrial processes. Many of these activities are regulated, and extensive requirements are typically placed on these sites. However, the potential for offsite transport and illegal disposal of NPS pollutants remains. Residuals can be sources of a wide variety of pollutants which may be transported by runoff into waterways or percolate into groundwater, causing contamination.

Mixed sources from developed land may include urban runoff, storm sewers, and releases from waste sites or dumps. These sources, described in previous sections, can deliver a wide array of contaminants to waterways. In Massachusetts, polluted runoff is commonly carried by stormwater into municipal separate storm sewer systems (MS4s), from which it is often discharged untreated into local waterbodies. USEPA regulates discharges from MS4s as point sources in urbanized areas. Phase II MS4

operators must obtain coverage under the NPDES permit from USEPA and develop a stormwater management program to develop, implement, and enforce a stormwater management plan to control pollutants discharged from its system to the maximum extent practicable.

The **introduction of non-native organisms (accidental or intentional)** can result in **hydrologic/ habitat modification.** The accidental or intentional introduction of certain plant or animal species may change the character of the habitat. Some invasive aquatic plants, such as *Myriophyllum* sp., may create vast monocultures that clog waterways and outcompete native species. The invasive reed *Phragmites australis* also creates vast monocultures that can change the structure of marshes, impeding flow and making marshes less resilient to climate change.

In Massachusetts, potential NPS pollution impacts associated with landfills, contaminated areas, and waste management sites are primarily addressed through the Massachusetts Superfund Law (MGL Chapter 21E), the Massachusetts Solid Waste Facility Regulations (310 CMR 19.000), Regulations for Land Application of Sludge and Septage (310 CMR 32.00), and Site Assignment Regulations for Solid Waste Facilities (310 CMR 16.00).

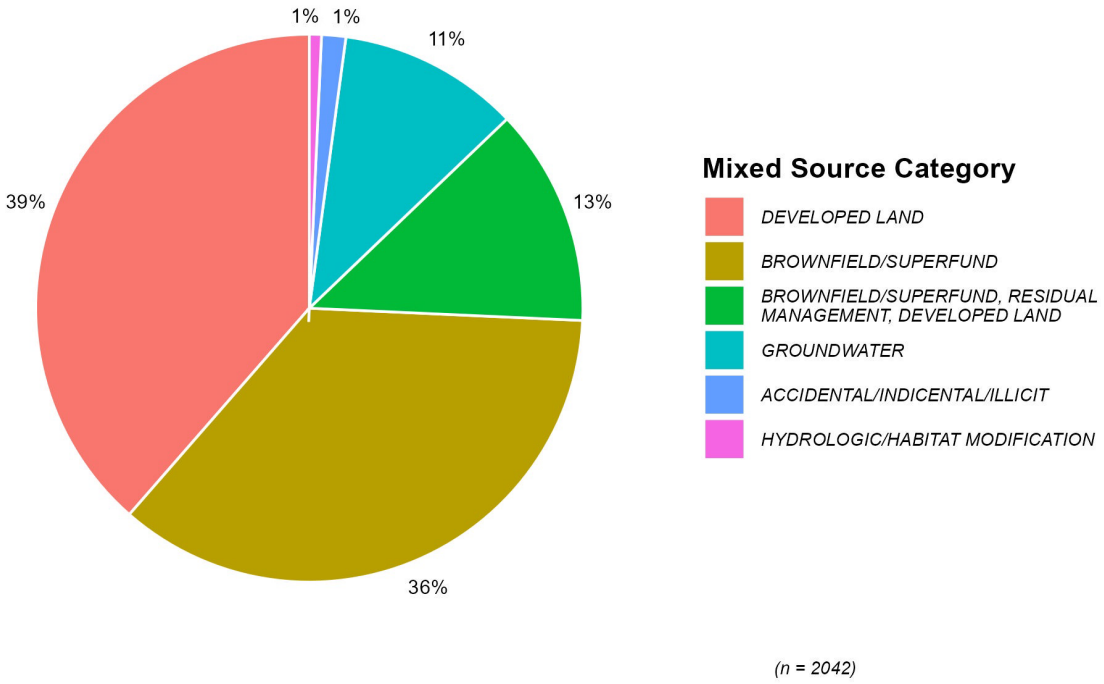


Figure 3.49. *NPS impairments from Massachusetts NPS subcategories (based on ATTAINS) of the Primary NPS Category Mixed Source. The figure includes the number of ATTAINS assessment records for these categories ("n").*

3.7 EFFECTS OF CLIMATE CHANGE ON NPS POLLUTION

Climate change refers to long-term shifts in global temperatures and weather patterns. In Massachusetts, climate science has found that temperatures have risen over the years and will continue to rise; there could be more intense rain events, and sea levels will rise and combine with more powerful coastal storms. These changes will impact Massachusetts residents, natural systems, and infrastructure in multiple ways. Warmer temperatures may result in heat waves that may impact human health and lead to droughts and periodic water shortages. Increased storm intensity may lead to increased stormwater runoff from developed areas, flooding, and infrastructure damage. The increase in more intense coastal storms has already resulted in damage to the coastal built environment. Sea level rise threatens coastal infrastructure, changes coastal ecosystems, and diminishes their ability to ameliorate the impacts of coastal storms (MA EOEEA, 2022).

Rising global temperature is a well-known effect of climate change. As temperatures rise, so does the saturation point, allowing for the air to hold more water vapor per unit area. Having a higher saturation point results in heavier rainfall events, leading to more runoff – and by extension, more NPS pollution than usual. In the Northeast, air temperature is rising over the years due to global warming and climate change, causing increasing levels of NPS pollution (Andreen, 2016). Rising temperatures also affect the timing of snowmelt each Spring. Changing weather patterns and rising temperatures have been causing snow to melt earlier in the Spring season. Snowmelt picks up pollutants and carries them to rivers and streams, and earlier snowmelt means an earlier deposition of NPS pollutants into streams, rivers, and waterbodies, which have adverse effects on aquatic ecosystems and viability for public use (Stone et al., 2002).

Climate change also impacts weather patterns, resulting in greater storm frequency and intensity. Hurricanes, for instance, in the Northern Hemisphere are fueled by warm air above the ocean rising through a cyclone. As a hurricane moves further northward, it travels through areas with increasingly cooler air temperatures, losing the energy that fuels it and, therefore, decreasing in intensity. As air temperatures increase above the ocean, hurricanes can maintain higher intensity than in the past while moving northward along the East Coast. The increased intensity of storms such as hurricanes causes more frequent and intense bursts of rainfall than seen in the past, which leads to NPS pollutants in stormwater runoff polluting streams, rivers, and waterbodies (Andreen, 2016). Increased rainfall and storm intensity also causes increased flood frequency and severity. In the Northeast, heavy rainfall events are increasing in intensity, leading to more severe and more frequent flooding (Melillo et. al., 2014). Heavy flooding overflows stormwater systems, releasing NPS pollutants into nearby streams, rivers, and waterbodies. (PBS Terra, 2024).

Vulnerable communities, including Communities with EJ populations, are disproportionately impacted by climate change and resultant increases in NPS pollution. EJ populations are typically more vulnerable to impacts of climate change and pollution, particularly low-income communities (Wilson et. al., 2010). As impacts from climate change intensify, the impacts natural disasters and related pollution has on EJ populations intensify, deepening environmental injustice and, by extension, the importance of offering aid to EJ communities.

In 2023, the MassDEP CWA s.604(b) Water Quality Management Planning grant program received increased federal funding for five years through the BIL. This funding brings unprecedented opportunities to conduct equity and climate resiliency assessments and to factor equity and climate resiliency goals into water quality programs using CWA s.604(b) funding. In response to the BIL, climate resiliency has been prioritized throughout the NPS Management Section's CWA grant programs. The NPS Management Section encourages grantees to integrate the EEA's Climate Resilience Design Standards Tool into design projects. The tool provides users with a preliminary climate exposure rating for proposed BMPs based on the best available statewide climate data, recommended resilience design criteria, and technical guidance.

3.8 IMPACTS OF NPS ON COMMUNITIES WITH EJ POPULATIONS

Disadvantaged communities are often disproportionately affected by environmental burdens. Environmental Justice work begins with understanding its core principles, as outlined by the First National People of Color Environmental Leadership Summit in 1991: "no community should bear a disproportionate burden of environmental hazards, all communities should have access to environmental benefits, and decision-making processes need to be transparent and include community voices." The Massachusetts Executive Office of Energy and Environmental Affairs (MA EOEEA, 2021) defines environmental justice as "the equal protection and meaningful involvement of all people and communities with respect to the development, implementation, and enforcement of energy, climate change, and environmental laws, regulations, and policies and the equitable distribution of energy and environmental benefits and burdens." MassDEP strives to uphold these principles and incorporate EJ throughout its work.

In Massachusetts, Communities with EJ Populations face unequal exposure to hazardous waste sites, landfills, and transfer stations, polluting industrial facilities, power plants, incinerators, and cumulative environmental hazards (Faber et al., 2002). Each of these sites produces pollution, meaning EJ Populations have greater exposure to pollutants than non-EJ populations. EJ Populations are already more vulnerable to pollutants and other environmental hazards due to discrimination, lack of resources, and other socioeconomic factors (Wilson et. al, 2010). This results in EJ Populations being negatively impacted by pollutants and environmental hazards to a larger degree than non-EJ Populations. The same is true for

NPS pollution; EJ Populations are often situated in locations closer to pollutant sources – whether point or nonpoint – and most often do not have the resources needed to address nor rebound from such pollutants.

The Massachusetts Office of Environmental Justice and Equity (OEJE) under the EEA is committed to ensuring a fair and equitable distribution of all environmental and energy benefits and burdens. Following the Massachusetts Environmental Justice Policy (2021) and EEA Environmental Justice Strategy (2024), MassDEP's NPS Management Section is committed to ensure a fair and equitable distribution of NPS funding and capacity-building resources. Section 4 elaborates on the strategies to involve EJ Populations in NPS planning and remediation through outreach, involvement, and inclusion to work toward offsetting environmental injustices that EJ Populations and communities face regularly. To help reduce inequity in NPS projects in Massachusetts, MassDEP will prioritize Communities with EJ Populations in grant funding. Through the introduction of the NPS EJ Coordinator program, the NPS Management Section aims to increase collaboration and engagement to further understand the equity needs at the local level, strengthen outreach, education, and assistance across the Commonwealth through NPS management grants to reduce the impacts of NPS on Communities with EJ Populations. Please see the Environmental Justice Population Maps to identify the EJ Block Groups in Massachusetts, languages spoken in Massachusetts, why a particular block group is considered an EJ Population or not, and the legacy of redlining in Massachusetts.

4. MASSACHUSETTS NPS MANAGEMENT PRIORITIES, GOALS, AND ACTIONS FOR 2025-2029

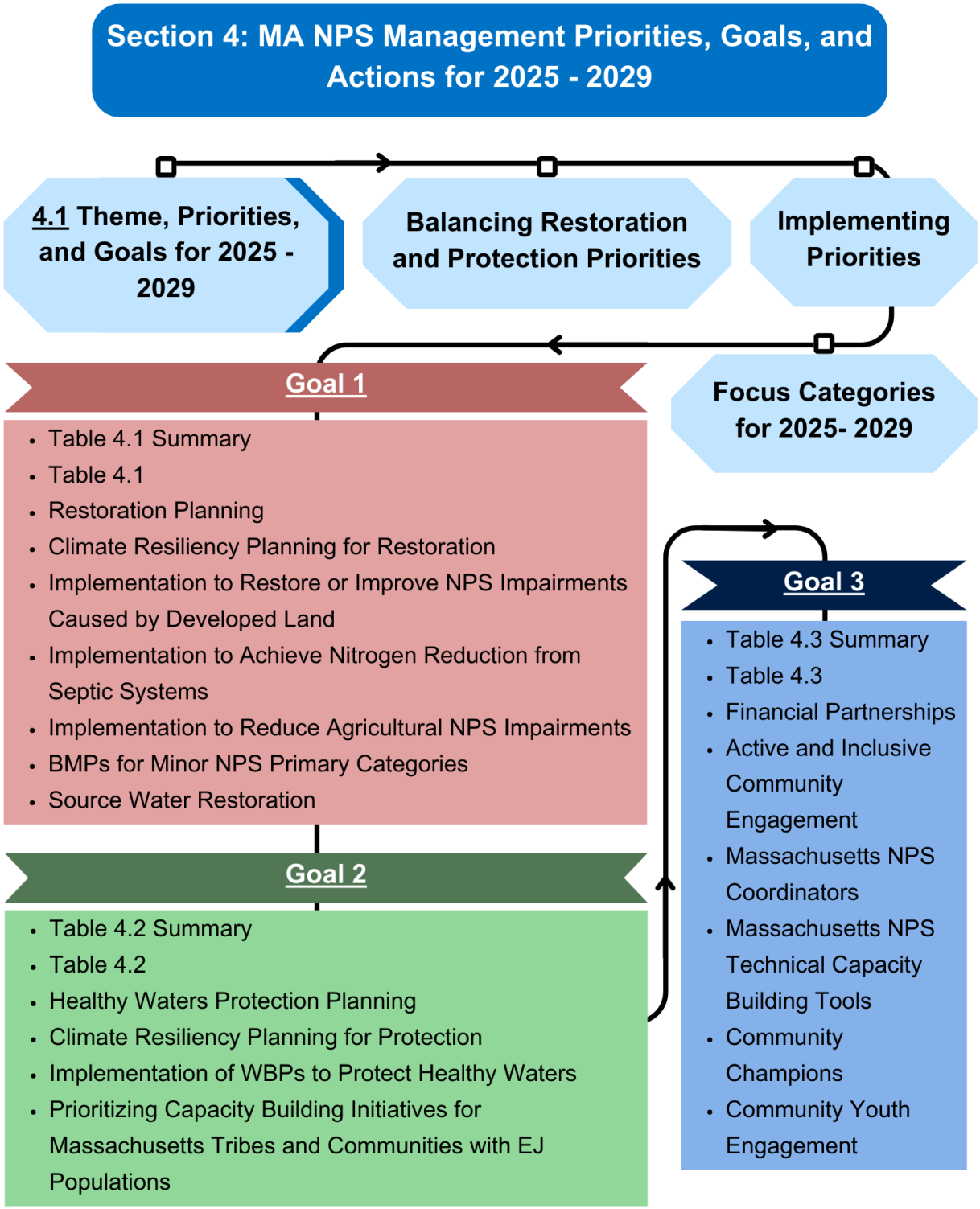


Figure 4.1. *Flowchart describing the subsections of Section 4.*

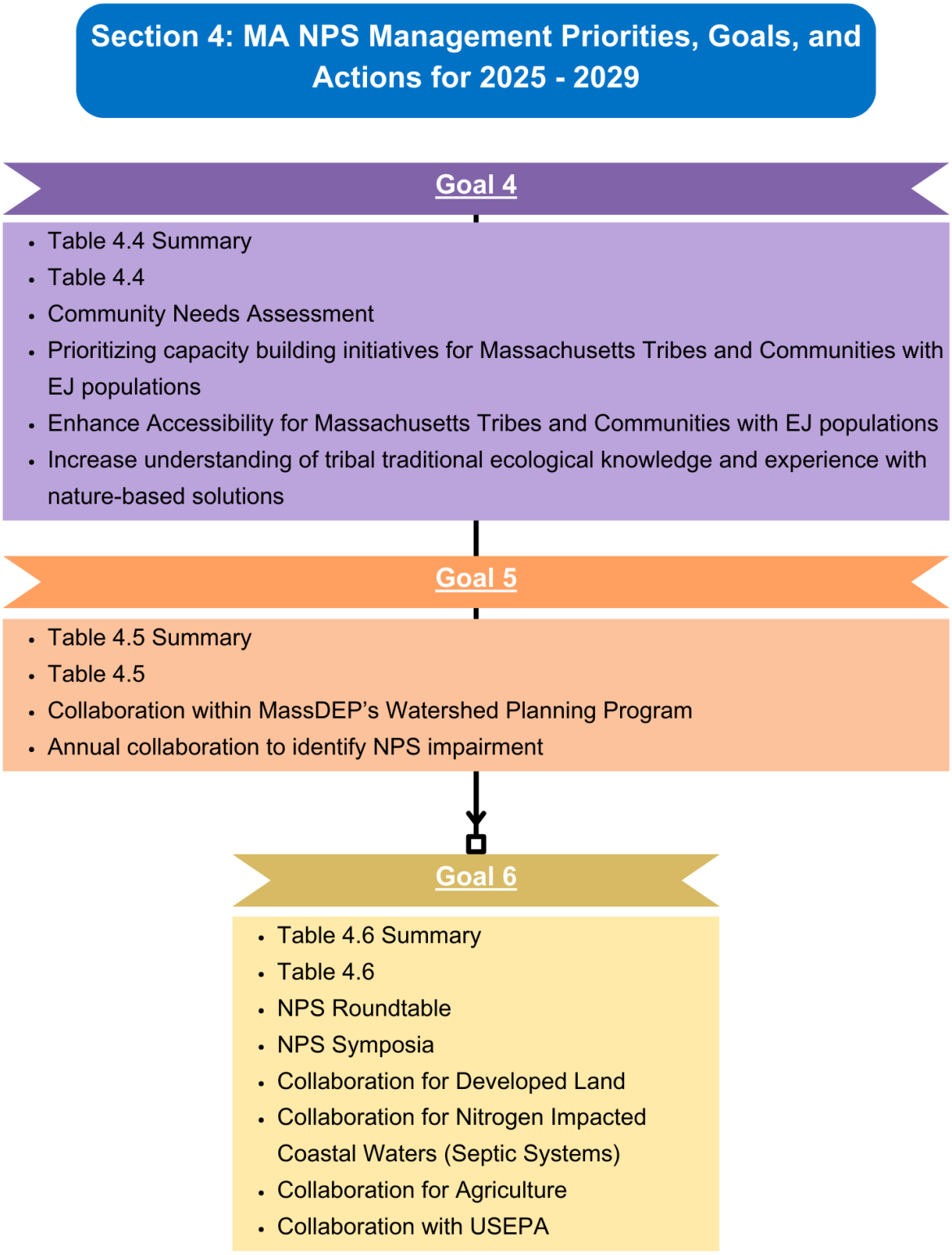


Figure 4.2. *Flowchart describing the subsections of Section 4 continued.*

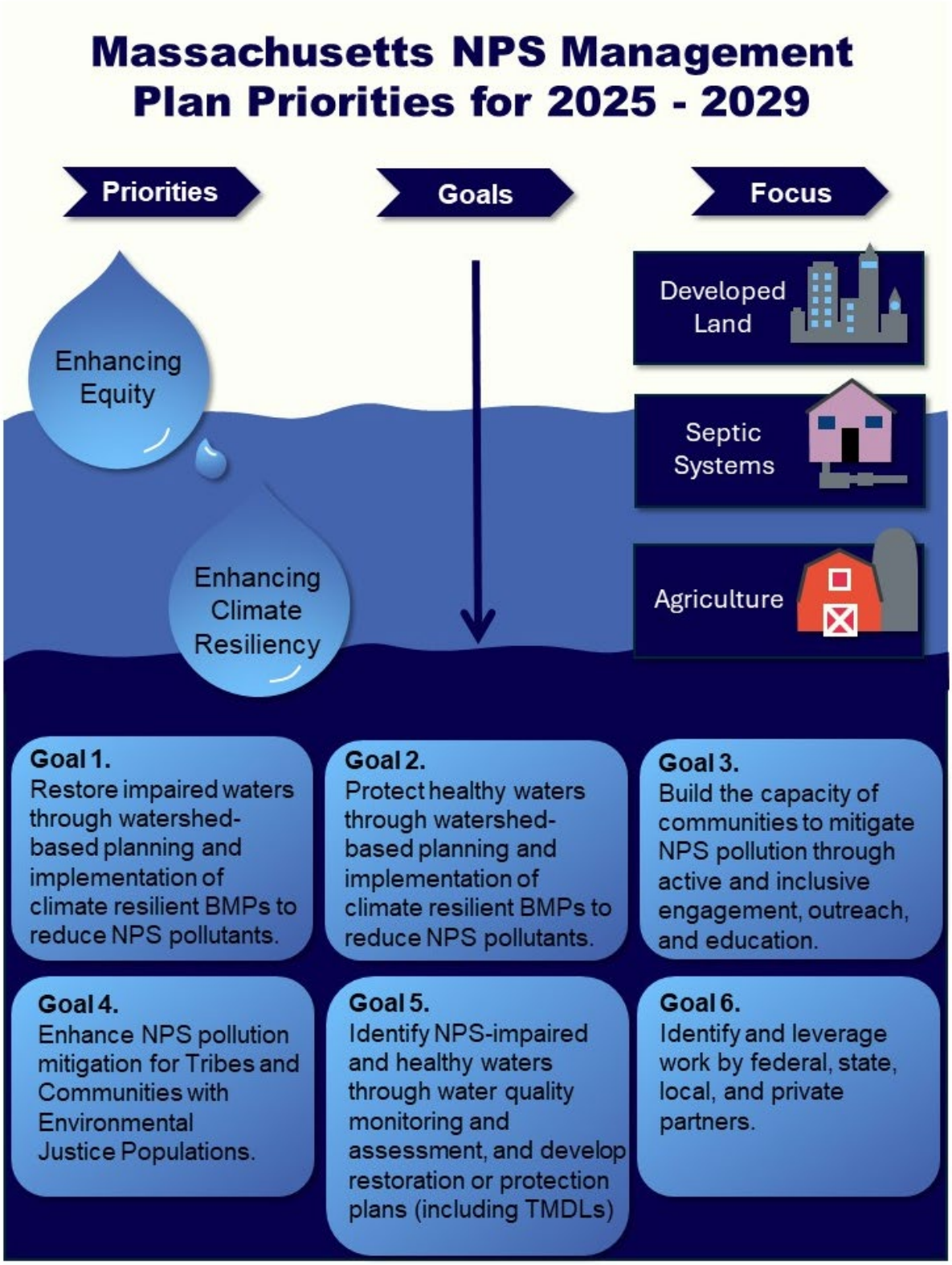


Figure 4.3. *Goals associated with overarching Massachusetts NPS Management Plan priorities and focus NPS categories.*

4.1 THEME, PRIORITIES, AND GOALS FOR 2025-2029

The central **theme** of the 2025-2029 Massachusetts NPS Management Plan is *meeting communities where they are*. This theme is aligned with two overarching **priorities:** (1) ensuring equitable access to the benefits of the Massachusetts NPS Management Plan by reducing equity barriers, prioritizing NPS pollution mitigation for Tribes and Communities with EJ Populations, and building capacity statewide to mitigate NPS pollution and restore the waters of the Commonwealth; and (2) enhancing climate resiliency through the incorporation of climate change adaptation and resiliency planning into NPS projects.

MassDEP will prioritize enhancing equity and climate resiliency and balance restoration with protection while accomplishing six NPS management **goals** (Figure 4.3) and specific **five-year objectives** (Figures 4.5, 4.25, 4.26, 4.29, 4.31, 4.32) under each goal through proposed **actions.** MassDEP will also monitor intermediate progress with **measurable milestones** (Tables 4.1, 4.2, 4.3, 4.4, 4.5, 4.6).

4.1.1. Balancing Funding Priorities between Restoration and Protection Goals

MassDEP will balance the twin priorities of restoration and protection while pursing these six NPS management goals. The USEPA CWA s.319 grant program guidelines allow states flexibility to use program funds and a limited amount of watershed project funds for activities to protect unimpaired, high-quality waters where a state identifies protection as a priority and has described a process for identifying such waters. Based on MassDEP's program priorities and funding allocations, approximately 20% of the annual 319 appropriation is available to be directed toward projects that address NPS Management Plan priorities other than remediation of impaired waters. Consistent with USEPA's program guidelines, MassDEP recognizes that it is important to consider the protection of waters and watersheds that are not listed as impaired, as well as those that have been delisted due to restoration efforts.

The primary focus of the NPS Management Plan remains on the restoration of impaired waters, and the majority of s.319 funds available for NPS watershed projects (which must implement WBPs) are directed at remediating water quality impairments as noted in Goal 1 of this Section. Waters impaired by NPS pollution in Massachusetts greatly outnumber waters that have been fully or partially restored,

highlighting the critical need to focus on this task. Additionally, impaired waters in Massachusetts tend to co-occur in urban areas where there is a higher prevalence of EJ census blocks. Any activities that restore urban waters would also benefit Communities with EJ Populations. Finally, any activities that would enhance or heighten the efficacy of restoration activities would also be prioritized based on the greatest benefit concept.

Protection of water quality in unimpaired or restored waters will be a secondary, but important priority. This includes an emphasis on prioritizing protection of waterbodies that have been restored. As noted in Goal 2 of this Section, MassDEP will engage in several activities to protect healthy waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.

Any MassDEP NPS-funded project or allocation of resources will address the goal of restoration or protection. The greatest amount of s.319 funding is dedicated to implementation of restoration work. MassDEP will continue to actively solicit project proposals and fund projects that protect high-quality and unimpaired waters within the funding limitations established under the CWA s.319 Program guidelines.

4.1.2. Implementing Funding Priorities

MassDEP has aligned funding priorities between the CWA s.604(b) and s.319 grant programs to maximize project benefits and address NPS pollution. Sections 2.2.1 and 2.2.2 of this Plan include detailed descriptions of these grant programs and their specific NPS focus areas. These grant programs focus work at the subwatershed level, targeting projects that have the greatest demonstrated potential to restore water quality through on-the-ground installation of NPS-focused BMPs. Assessment and planning projects supported by MassDEP's CWA s.604(b) funds frequently lead to projects that are implemented through MassDEP's CWA s.319 grant program. The majority of projects will continue to focus on addressing impaired waters identified in the Massachusetts Integrated List of Waters, implementing recommendations from approved TMDLs and WBPs, and continuing successful work started by projects previously funded by MassDEP or NPS partner programs. MassDEP will also focus on NPS education and outreach, assessment, and protection of unimpaired waters. In all cases, projects selected for funding will support the goals and objectives of the Massachusetts NPS Management Plan.

Restoration of Waters Impaired by NPS Pollution

MassDEP will continue to focus the majority of CWA s.319 program funding toward NPS watershed projects that implement WBPs to address Category 5 impairments (those on the 303(d) list) or TMDL recommendations. When evaluating these types of projects, MassDEP will focus funding on projects that

can demonstrate the greatest benefits for water quality improvement. Projects that will result in significant load reductions of pollutants causing identified impairments will receive higher prioritization. Further, projects that would install or construct BMPs that can serve multiple functions will be encouraged.

Multiple-function BMPs are structural or non-structural practices that would achieve a suite of benefits, including increased resilience of the BMPs to climate change, protection of groundwater, enhanced groundwater recharge, and improved in-stream habitat. These benefits are in addition to improvement in water quality through addressing sources of NPS pollution. Priority will also be given to projects that continue work initiated under a previous CWA s.319 grant or other NPS partner program such as CWA s.604(b), CZM's CPR grants, Massachusetts Environmental Trust (MET), or USDA-NRCS Farm Bill programs.

Protection of Healthy Waters

MassDEP recognizes that protecting areas of the state where water quality currently meets or exceeds applicable water quality standards is highly desirable. Proactive protection of healthy waters, particularly those that are at risk of impacts from NPS pollutants, can be a more efficient use of public funds than the long-term restoration projects that would be needed if the waterbody is not protected and becomes impaired.

MassDEP will continue to direct resources to programs and projects that ensure that high-quality and restored waters are protected. MassDEP will focus on water protection planning activities, including the development of MassDEP-accepted 9e-WBPs or a-WBPs and climate resiliency planning to protect healthy waters, implementation projects to support healthy waters, and source water protection.

MassDEP's NPS Management Section will integrate Environmental Justice and Climate Resiliency into the USEPA Recovery Potential Screening Tool (RPST) to identify and prioritize the protection and restoration of unimpaired, high-quality, and threatened waters, respectively. MassDEP will use this information to establish future priorities inclusive of enhancing equity and climate resiliency.

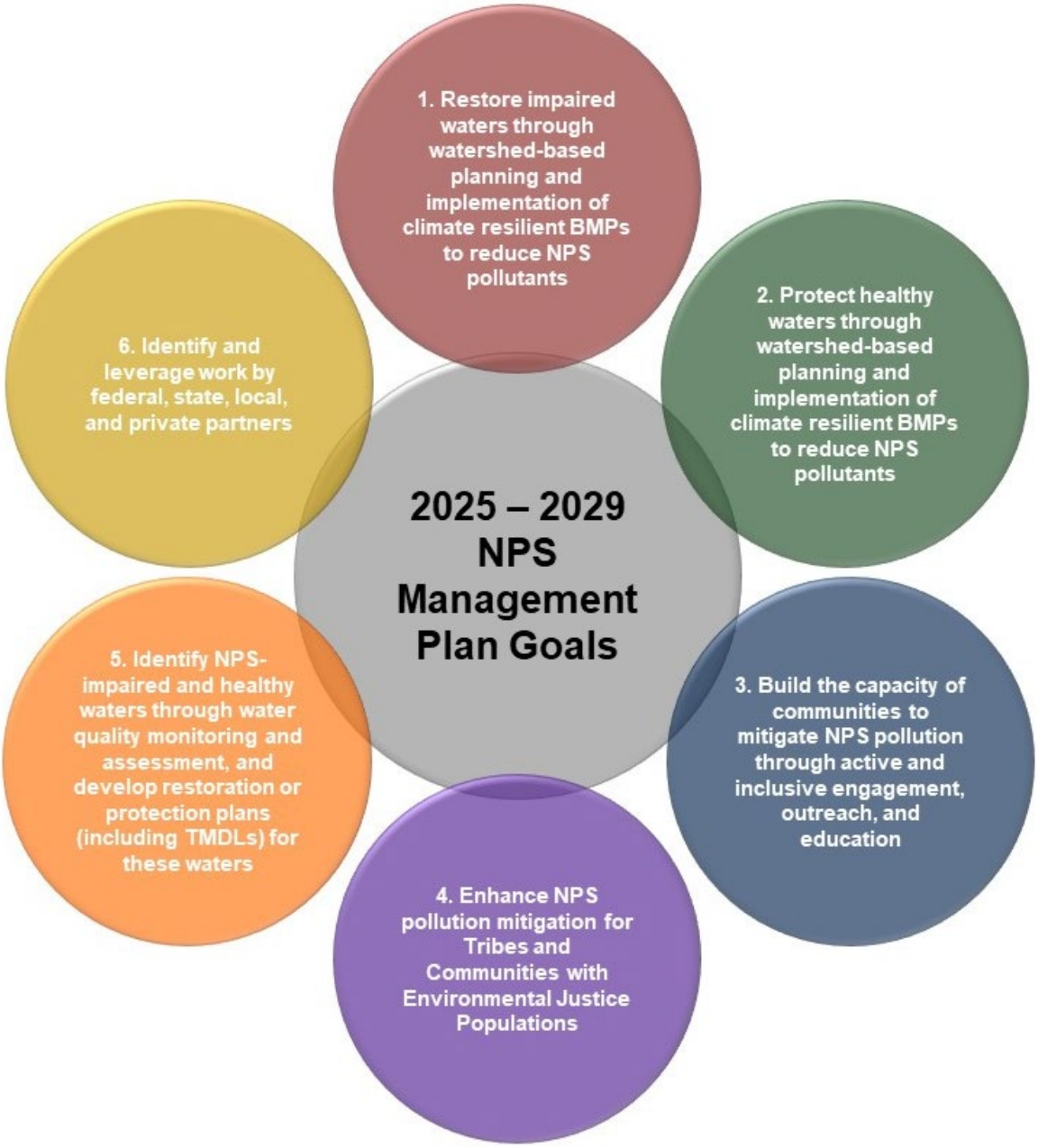


Figure 4.4. *The goals of the Massachusetts 2025-2029 NPS Management Plan.*

4.1.3 Focus Categories for 2025-2029

The Massachusetts NPS Management Plan (2025-2029) focuses on the three major NPS categories identified in Section 3: developed land, septic systems, and agriculture. Together, these primary NPS

categories (based on USEPA's ATTAINS) comprise 61% of NPS-impaired waters in the 2022 Massachusetts Integrated List of Waters (MassDEP, 2023). The goals identified in this section describe how MassDEP will address NPS pollution from developed land, septic systems, and agriculture, including impacts to Tribes and Communities with EJ Populations, and the incorporation of climate resiliency into NPS planning and implementation while balancing competing water quality restoration and protection needs over the next five years.

Goal 1. Restore impaired waters through watershed-based planning and implementation of climate resilient Best Management Practices (BMPs) to reduce NPS pollutants.

Figure 4.5. *Goal 1 of the Massachusetts NPS Management Plan (2025-2029).*

Table 4.1 Summary: Table 4.1 provides context for Goal 1 (Restore impaired waters through watershed-based planning and implementation of climate-resilient BMPs to reduce NPS pollutants). Additional information includes actions, relevant **primary** NPS categories, measurable milestones, and the completion timeline of these milestones. Goal 1 (Table 4.1) includes:

- Two planning objectives addressing the development of 9e-WBPs and climate resiliency planning for all NPS categories (major and minor).
- Three implementation objectives attributed to the restoration/improvement of waters with NPS impairment caused by Massachusetts's three major NPS categories.
- One implementation objective attributed to the restoration/improvement of waters with NPS impairment caused by Massachusetts's eight minor NPS categories.
- One implementation objective attributed to source water restoration.

Figure 4.6. *A rain garden installed in Franklin, Mass., through a CWA s.319 NPS implementation grant. Photo: Town of Franklin.*

Table 4.1. *Goal 1.*

Table 4.1. Goal 1. Restore impaired waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.				**Schedule**				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
1. **Restoration Planning:** Facilitate the development of MassDEP-accepted 9e-WBPs or a-WBPs to guide the restoration of NPS impaired waters through watershed projects.	• Use targeted outreach and both active and inclusive community engagement to facilitate the development of 9e-WBPs to restore NPS impaired waters. • Use targeted outreach to assist in converting Massachusetts comprehensive or targeted watershed management plans (CWMP or TWMPs) to 9e-WBPs. • Evaluate draft 9e-WBPs. • Provide feedback if modifications are required. • Accept 9e-WBPs or USEPA-approved a-WBPs that meet all requirements. • Post accepted WBPs on the MassDEP webpage. • Link MassDEP-accepted WBPs to INSPIRE, MassDEP's NPS Capacity Building Tool for potential applicants and partners.	All	1a. Two MassDEP-accepted 9e-WBPs to restore NPS impaired waters per year.	1a ☐	1a ☐	1a	1a ☐	1a ☐

Table 4.1. Goal 1. Restore impaired waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
2. **Climate Resiliency Planning in Restoration:** Engage local partners on climate change adaptation, resiliency planning, and restoration of NPS impaired waters	• Create a user guide for the RMAT Climate Resilience Design Standards Tool to be used with BMPs to mitigate NPS impairments. • Update the Massachusetts Clean Water Toolkit with low-maintenance climate-resilient BMPs. • Promote climate resiliency planning with targeted outreach and support with CWA s.604(b) grant program funding. • Incentivize implementation projects with climate-resilient BMPs. For example, add points in the proposal evaluation criteria for the CWA s.319 grant selection process.	All	2a. NPS user guide for the RMAT Climate Design and Standard Tool. 2b. Incorporate a list of low-maintenance climate-resilient BMPs into the Massachusetts Clean Water Toolkit 2c. Five Climate Resiliency planning projects 2d. Implementation of two climate-resilient BMPs		2b ☐	2a ☐	2c ☐	2d ☐
3. **Implementation to Restore/Improve NPS Impairment caused by Developed Land:** Support the	• Provide technical support and funding through the CWA s.319 grant program to support the implementation of WBPs for waters with high potential for restoration. • Provide technical support and funding through CWA s.319 grant	Developed Land (Focus Category: 1)	3a. One project achieving partial or full restoration. 3b. Five implementation projects to improve waters that directly benefit Massachusetts tribes and Communities with EJ Populations.				3a ☐ 3b ☐	3c ☐

Table 4.1. Goal 1. Restore impaired waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
implementation of 9e-WBPs to fully or partially restore two waterbodies impaired by developed land.	program to support the implementation of WBPs for waters that directly benefit Massachusetts tribes and EJ Populations. • Prepare an NPS Success Story that documents partial or full restoration.		3c. One Type 1 NPS success story focused on developed land.					
4. **Implementation to Achieve Nitrogen Reduction in Massachusetts' Nitrogen Impacted Coastal Waters:** Support the implementation of 9e-WBPs to reduce NPS impairment from septic systems.	• Provide technical support and funding through the CWA s.319 grant program to support the implementation of the Cape Cod s.208 Plan • Provide technical support and funding through the CWA s.604(b) grant program to assist with the development of a Martha's Vineyard s.208 Equivalency Plan and/or other watershed plans at the regional scale and support its potential implementation through the CWA s.319 grant program • Provide technical support and funding through the CWA s.604(b) grant program to assist with the development of a Nantucket s.208	Septic Systems (Focus Category: 2)	4a. MassDEP will organize and facilitate one annual Nitrogen Impacted Coastal Waters workgroup meeting to engage groups actively involved in the restoration of Nitrogen Impacted Coastal Waters in the state. 4b. CWA s.208 Equivalency Plans and/or other watershed plans at the regional scale for Marthas Vineyard, and Nantucket. 4c. Five completed implementation projects to improve nitrogen reduction by the installation of enhanced I/A systems, permeable reactive	4a ☐	4a ☐	4a ☐ 4b ☐	4a ☐ 4b ☐	4a ☐ 4c ☐ 4d ☐

Table 4.1. Goal 1. Restore impaired waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
	Equivalency Plan and/or other watershed plans at the regional scale and support its potential implementation through the CWA s.319 grant program • Use targeted outreach and assist with the development of a s.208 Plan and/or other watershed plan at the regional scale for Plymouth County through the CWA s.604(b) grant program and its potential implementation through the CWA s.319 grant program. • Engage stakeholders to identify opportunities for the NPS Management Section to assist with restoration work in Nitrogen Impacted Coastal Waters.		barriers, or through habitat (e.g. salt marsh) restoration. 4d. One NPS success story achieving nitrogen load reductions from installation of enhanced I/A septic systems					
5. **Implementation to Reduce Agricultural NPS Impairment:** Support the development and implementation of	• Collaborate with NRCS and USEPA in the NWQI program to make progress in restoring waters impaired by agriculture. • Continue to support the Massachusetts Agricultural NPS Coordinators Program in developing	Agriculture (Focus Category: 3)	5a. Continue participation in NWQI partnership program. 5b. One 9e-WBP to address urban agricultural NPS impairment.	5a ☐	5a ☐	5a ☐	5a ☐ 5b ☐	5a ☐ 5c ☐ 5d ☐

Table 4.1. Goal 1. Restore impaired waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
9e- WBPs to reduce agricultural NPS impairment.	9e- WBPs for waters impaired by urban agricultural NPS affecting Communities with EJ Populations. • Provide technical support and funding through the CWA s.319 grant program to support the implementation of 9e-WBPs for waters with agricultural impairments. • Promote and support a pilot-scale cranberry bog restoration plan.		5c. Two implementation projects in watersheds impaired by agriculture. 5d. One 9e-WBP that that includes a pilot-scale cranberry bog restoration.					
6. **Implementation to Reduce NPS Impairment from Massachusetts Minor NPS Categories:** Support the implementation of 9e-WBPs to reduce NPS impairments due to Internal Cycling, Hydrologic and Habitat Modification,	• Update the Massachusetts Clean Water Toolkit to incorporate BMPs with nature-based shoreline stabilization practices and restoration of impacted habitats. • Provide technical support and funding through the CWA s.319 grant program to support the implementation of 9e-WBPs to reduce NPS impairment from all minor categories. • Promote awareness of chloride contamination and encourage new	Massachusetts Minor NPS Categories Internal Cycling, Hydrologic and Habitat Modification, Atmospheric Deposition, Natural Process, Residual Management,	6a. Updated Clean Water Toolkit with nature-based BMPs to restore impacted habitats. 6b. Five completed implementation projects to reduce NPS impairment from minor NPS categories. 6c. One completed 9e-WBP with restorative strategies to reduce chloride impairments.		6a ☐		6b ☐ 6c ☐	

Table 4.1. Goal 1. Restore impaired waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
Atmospheric Deposition, Natural Process, Residual Management, Transportation, Marinas and Recreational Boating, and Resource Extraction.	and creative strategies to minimize chloride use and/or mitigate impacts. • Provide technical support and funding through the CWA s.604(b) grant program to assist with the development of a pilot scale 9e-WBP to restore a water impaired primarily by chloride.	Transportation, Marinas and Recreational Boating, and Resource Extraction.						
7. **Source Water Restoration:** Prioritize projects to restore drinking water sources.	• Work with MassDEP's Drinking Water Program to prioritize implementation projects to restore drinking water sources.	All	7a. One completed project achieving partial or full restoration of a drinking water source.					7a ☐

a) Restoration Planning

Freshwater sources can be classified as either surface water (e.g., lakes, estuaries, rivers, and streams) or groundwater (e.g., aquifers). Water quality restoration is important in protecting multiple beneficial surface water uses, such as drinking water sources, aquatic life, and recreation. Surface waters receive runoff from, or drain, surrounding land areas known as **watersheds**. The most effective means of addressing NPS pollution is through the watershed approach. According to the *Nonpoint Source Program and Grants Guidelines for States and Territories* (USEPA, 2024), "[t]he watershed approach is a framework that focuses efforts on an area of land that drains to a specific point, such as the confluence of two rivers, a lake, or a coastal estuary. This framework guides the generation of a WBP that addresses impairments and threats to water quality. Watershed-based planning is commonly characterized by diverse, well-integrated collaboration; coordinated priority setting; integrated solutions; and a specific geographic focus driven by environmental and public health objectives supported by strong science and data. A watershed-based planning framework addresses water quality problems holistically by fully assessing the causes and sources of pollution and prioritizing restoration and protection strategies to address these problems." MassDEP will prioritize the watershed approach to facilitate the restoration of impaired waters and integration with USEPA-approved TMDLs.

What is a Watershed?

A **watershed** is the area of land that contributes runoff to a lake, pond, river, stream, wetland, or estuary.

Nine-element Watershed-Based Plans (9e-WBPs) are required for any NPS restoration project to be supported by the CWA s.319 funds. A 9e-WBP is a blueprint for the management of watersheds with impaired waters that incorporates nine minimum elements outlined by the USEPA. The purpose of a Massachusetts 9e-WBP is to organize information about Massachusetts watersheds in a format that will enhance the development and implementation of projects to restore or protect water quality and beneficial uses in the Commonwealth. These 9e-WBPs may address water quality problems in impaired waters or protect water quality in healthy waters. The scale of a 9e-WBP should be

The nine USEPA-required minimum elements of a 9e-WBP for threatened or impaired waters:

a. Identify causes of pollution
b. Estimate pollutant loading into the watershed and the expected load reductions
c. Describe management measures that will achieve load reductions and targeted critical areas
d. Estimate amounts of technical and financial assistance and the relevant authorities needed to implement the plan
e. Develop an information/ education component
f. Develop a project schedule
g. Describe the interim, measurable milestones
h. Identify indicators to measure progress
i. Develop a monitoring component

commensurate with the problem(s) it is intended to address and should consider the nature of the impairment and the unique conditions of the watershed. WBPs should reference, incorporate or otherwise leverage other relevant planning documents such as US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) NWQI watershed assessments, hazard mitigation plans, source water protection plans, USEPA Geographic Programs (such CWA s.208 plans, targeted watershed management plans (TWMPs), and comprehensive wastewater management plans (CWMPs), and National Estuary Program (NEP) comprehensive conservation and management plans and annual work plans Although 9e-WBPs will typically be required for impaired waters and healthy waters, an alternative WBP could be allowed for healthy waters in some circumstances at MassDEP's discretion.

The EPA-required minimum elements of Alternative Watershed-Based Plans (Alternative Plans):

(1) describe watershed project goal(s) and explain how the proposed project(s) will achieve water quality goals;
(2) identify the causes or sources of NPS impairments, water quality problems, or threats to healthy waters, including critical source areas addressed by the alternative plan;
(3) propose management measures and BMPs (including a description of operation and maintenance requirements) and explain how these measures will effectively address the NPS impairment identified above;
(4) establish a schedule with milestones to guide project implementation; and
(5) include a water quality results monitoring component describing the processes and measures (e.g., water quality parameters, stream flow metrics, biological indicators) that will help gauge project success (EPA, 2024).

Alternative Watershed-Based Plans (a-WBP) may be developed in instances where a 9e-WBP is unnecessary. USEPA provides the following circumstances where a-WBPs may be developed, providing states flexibility to use CWA s.319 watershed project funds to implement a USEPA-approved alternative plan and support community demonstration projects in disadvantaged communities: a) when the impairment is cause by a change in physical conditions or is otherwise not pollutant-specific, b) when responding to an NPS pollution emergency or urgent NPS public health risk, c) when protecting healthy waters, d) when addressing an isolated, small-scale water quality problem resulting from one or a few sources of pollution, e) when addressing only agricultural sources in an NRCS NWQI watershed, f) when implementing a USEPA-approved Tribal Nonpoint Source Management Plan, or g) in other circumstances as approved by the USEPA. All a-WBPs require USEPA approval

In accordance with the theme of the Massachusetts NPS Management Plan for 2025-2029 (*meeting communities where they are*), MassDEP's NPS Management Section presents a WBP roadmap (Figure 4.8) that shows multiple pathways through which a community can initiate and/or complete the watershed

planning process with available funds. It also shows new flexibilities for Massachusetts Tribes and Communities with EJ Populations to enhance equitable access to NPS funding.

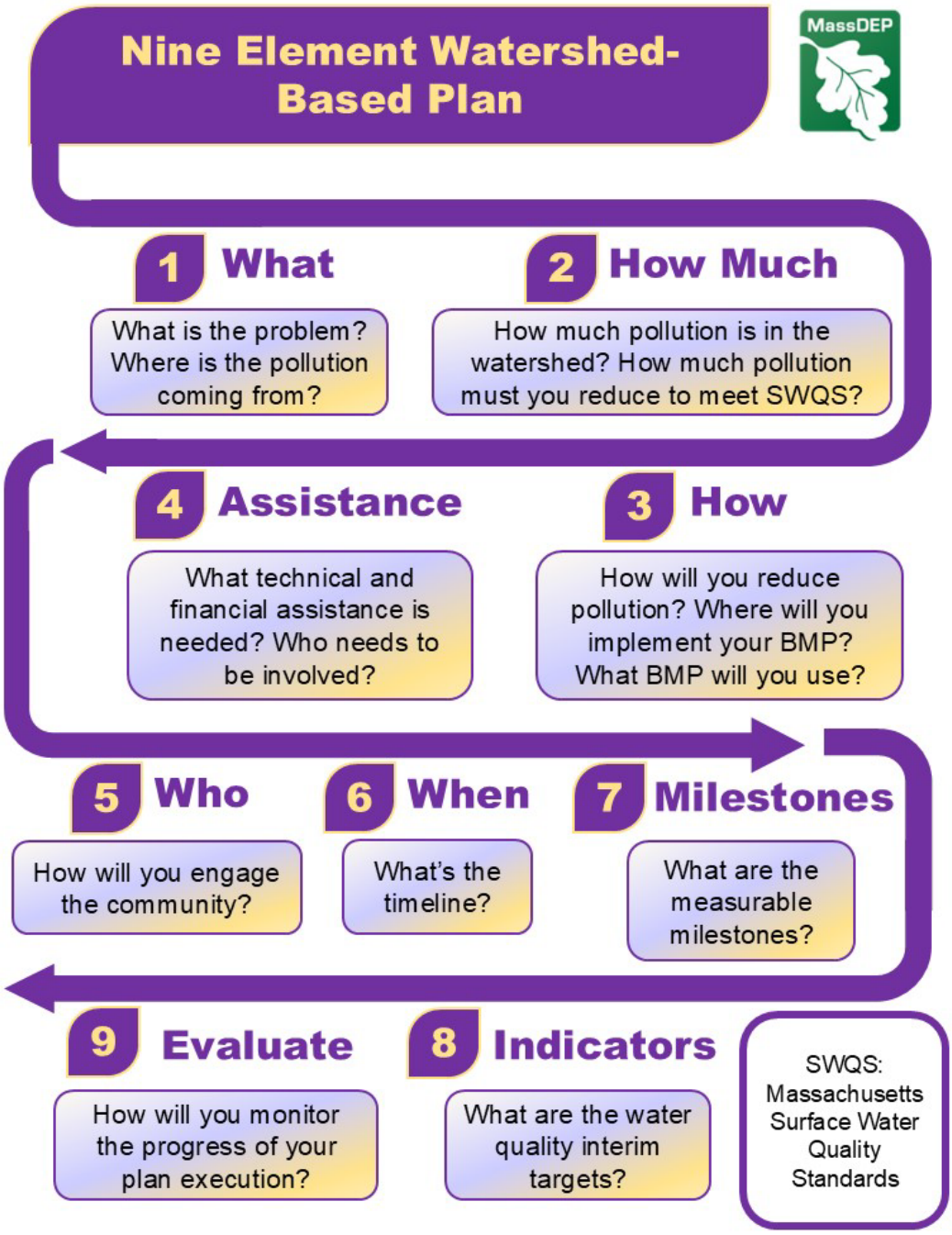


Figure 4.7. *The nine USEPA-required minimum elements of a Watershed-Based Plan (9e-WBP).*

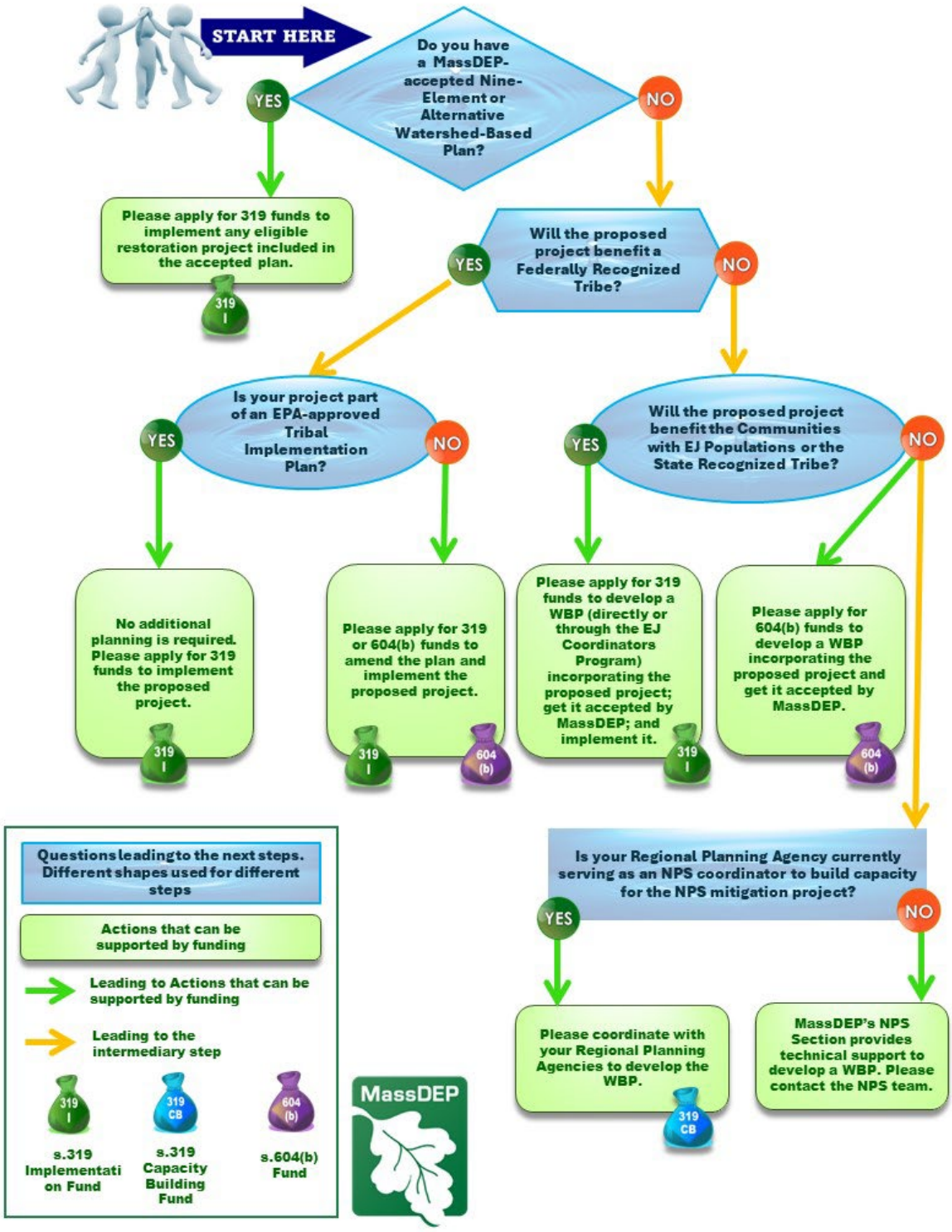


Figure 4.8. *A roadmap to develop a 9e-WBP or an a-WBP in Massachusetts with available funding through CWA s.604(b) or s.319 grants. Funding is subject to availability of federal funds, NPS grants workplan, and approval of grant proposals.*

The NPS Management Section will facilitate the development of MassDEP-accepted 9e-WBPs or a-WBPs and updates to existing WBPs to guide the restoration of NPS-impaired waters through watershed projects. To achieve this objective, MassDEP will:

- Use targeted outreach and active and inclusive community engagement to facilitate the development of 9e-WBPs or a-WBPs to restore NPS impaired waters.
- Support efforts to update existing WBPs that are outdated or would otherwise benefit from revision
- Use targeted outreach to assist in converting Massachusetts comprehensive or targeted watershed management plans to 9e-WBPs.
- Evaluate draft 9e-WBPs.
- Provide feedback if modifications are required.
- Accept 9e-WBPs or a-WBPs that meet all requirements.
- Publish accepted WBPs on the MassDEP webpage.
- Link MassDEP-accepted WBPs to INSPIRE, MassDEP's NPS Capacity Building Tool for potential applicants and partners.

CWA s.208 and equivalent plans. In some coastal areas in Massachusetts – particularly on Cape Cod, the Islands (Marthas Vineyard and Nantucket), and Southeastern Massachusetts – there is a problem with too much nitrogen loading to estuaries and embayments. Septic systems contribute significantly to these nitrogen loads. Other sources include lawn and garden fertilizers, agricultural runoff, and stormwater runoff. Under CWA s.208, Massachusetts has developed an area-wide water quality management plan for Cape Cod to address point and nonpoint source pollution over a twenty-year period. CWA s.208 plans include an analysis of alternative waste treatment systems, identification of agricultural- and silvicultural-related nonpoint pollutant sources, runoff from manure disposal areas, and from land used for livestock and crop production, and a process to control the disposition of all residual waste generated in such areas that could affect water quality.

Planning for water quality restoration and protection of the Nitrogen Impacted Coastal Waters of Massachusetts begins with regional scale watershed management plans such as the approved CWA s.208 Area Wide Water Quality Management Plan for Cape Cod and CWA s.208 Equivalency Plans currently under development in the Islands. The sources and impacts of NPS pollutants identified in a 208 Plan can be addressed by a Watershed Management Plan (WMP). A WMP is based on either a CWMP or TWMP and is an approach to mitigate or prevent water quality problems that result from both point and nonpoint sources. WMPs are intended to both provide an analytic framework to restore water quality in impaired waters and to protect water quality in other waters adversely affected or threatened by point source and

nonpoint source pollution. Local governments with WMPs can apply for a Watershed Permit, which authorizes the implementation of nitrogen reduction strategies based on the WMP.

A **Comprehensive Wastewater Management Plan (CWMP)**, consistent with MassDEP's Guide to Comprehensive Wastewater Management Planning, is a plan that develops and evaluates alternatives for potential implementation to meet a community's wastewater infrastructure and management needs. A **Targeted Watershed Management Plan (TWMP)** is a plan consistent with a CWA s.208 or similar regional scale plan that contains all elements of a CWMP and is developed for the following two scenarios: (1) to address waterbody impairments or impacts identified in a TMDL, Alternative Restoration Plan, Massachusetts Estuaries Projects (MEP) Report, or Scientific Evaluation and (2) to implement a TMDL or Alternative Restoration Plan in a watershed or sub-watershed.

Converting CWMPs and TWMPs into Watershed Management Plans, as well as into 9e-WBPs, is an eligible use of CWA s.604(b) grant funds. Additionally, for projects funded through CWA s.319, if the project directly benefits Communities with EJ Populations, a completed and approved WBP will NOT be required before the beginning of the CWA s.319 contract. The WBP can instead be completed as a part of the CWA s.319 contract. Under federal Justice40 Guidelines, Massachusetts Communities with EJ Populations are eligible to apply for CWA s.319 funds to:

- complete the development of a CWMP;
- complete the development of a TWMP; and
- convert a CWMP or TWMP into a 9e-WBP.

Proposals for projects directly benefiting Communities with EJ Populations must show a detailed plan to engage the EJ Populations actively and inclusively throughout the project.

The process to convert a CWMP or TWMP into a 9e-WBP is depicted in Figure 4.9.

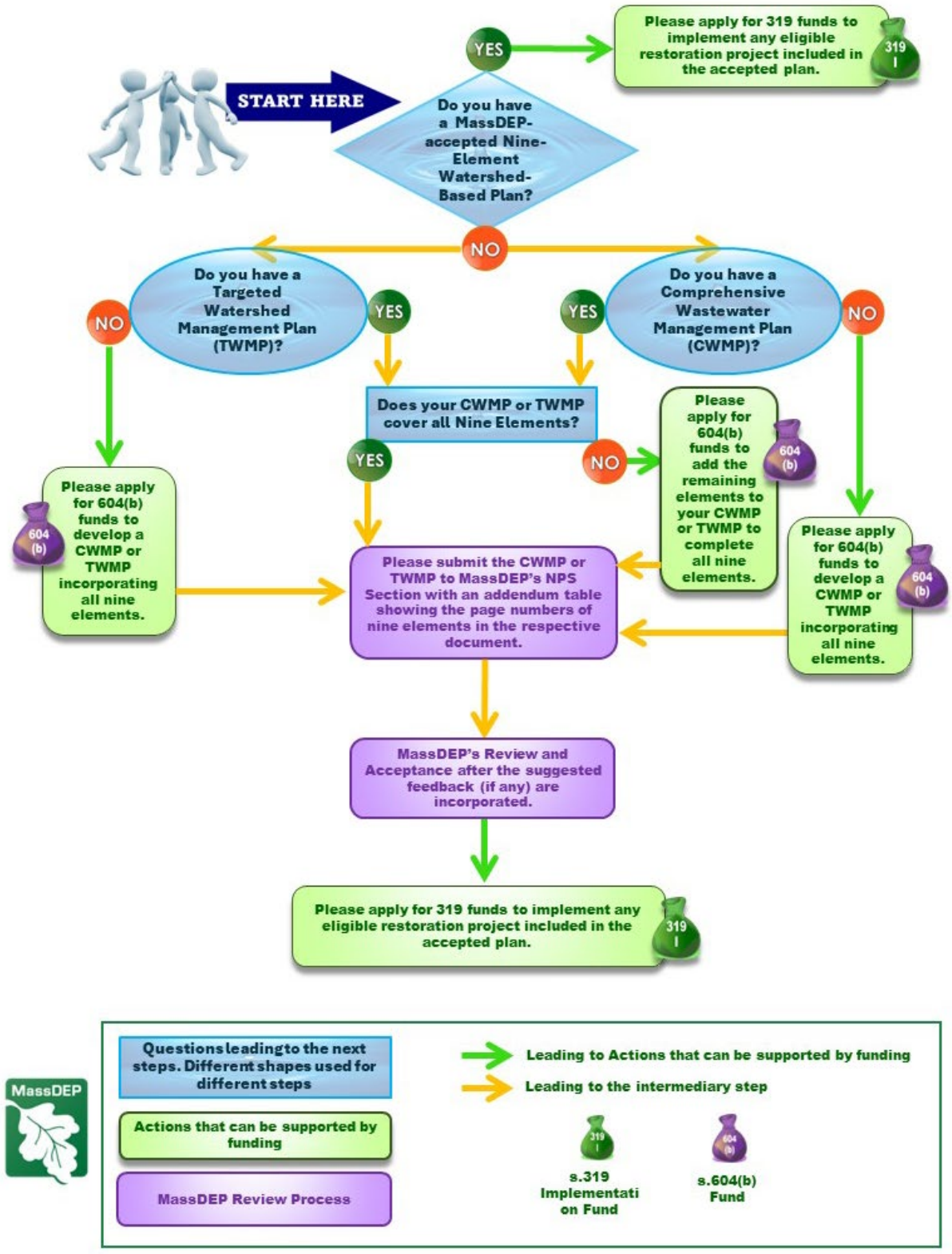


Figure 4.9. *Path to convert a CWMP or TWMP into a 9e-WBP. Funding is subject to availability of federal funds, NPS grants workplan, and approval of grant proposals.*

To assist communities, especially those with limited technical capacity and resources, with the development of WBPs, MassDEP developed the WBP Tool, an online application that guides users through the steps of WBP development using a preformatted template and interactive GIS-based map to identify target watersheds. MassDEP continues to provide support for the WBP Tool to assist communities with the development of WBPs. In addition, MassDEP staff are also available to support plan development and provide feedback on draft plans before they are accepted. MassDEP also developed INSPIRE, an online ArcGIS-based capacity building tool that shares information about CWA s.604(b) and s.319 grants; showcases successful grant-funded projects throughout the Commonwealth as examples; and presents a collection of geospatial layers as resources to help communities develop new project ideas for competitive grant proposals. Figure 4.10 shows the WBP tab in INSPIRE that enables users to access all MassDEP-approved WBPs. A full description of the USEPA-required nine-elements of a WBP, a link to the WBP Tool, and MassDEP-accepted WBPs are available online at MassDEP's Nine-Element Watershed-Based Plans Information website. These, and additional NPS tools, are described in greater detail in Goal 3.

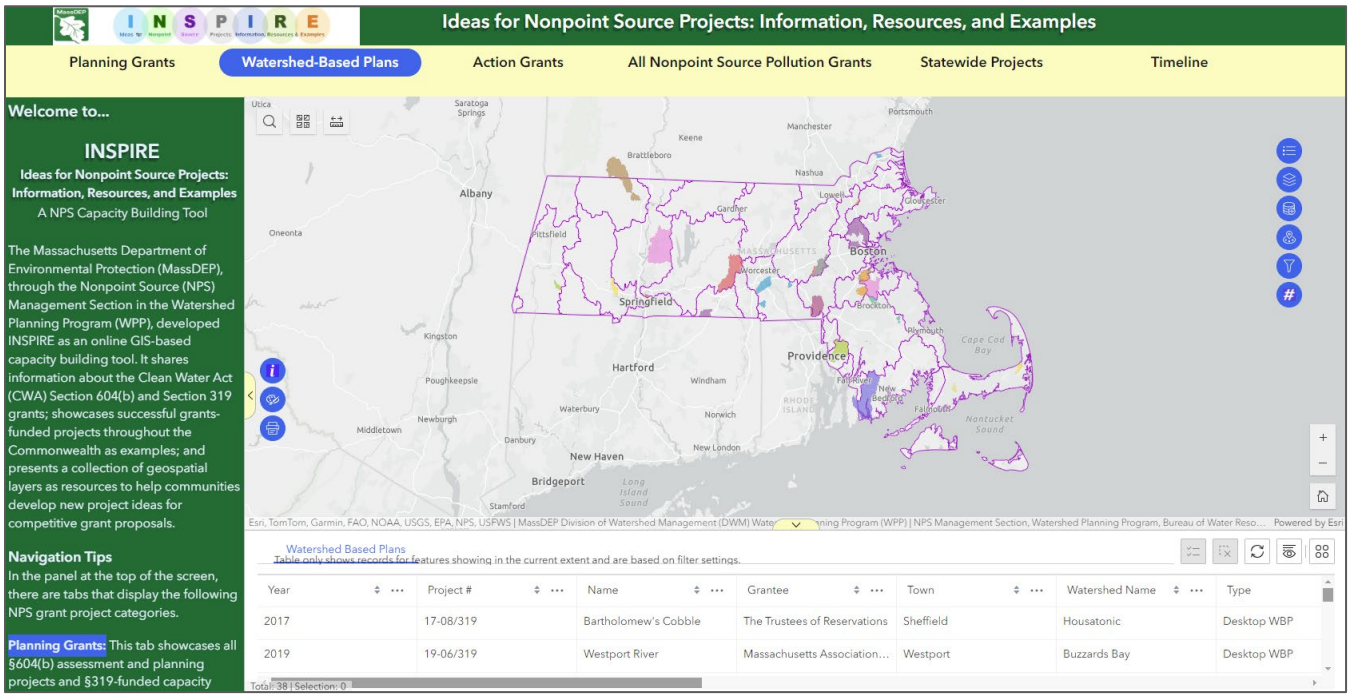


Figure 4.10. *INSPIRE (Ideas for Nonpoint Source Projects: Information, Resources, and Examples), MassDEP's online GIS-based NPS capacity building tool showing MassDEP-approved 9e-WBPs.*

b) Climate Resiliency Planning for Restoration

Mitigating the effects of climate change and promoting climate resilience planning for the restoration of impaired waters is a priority of the Massachusetts NPS Management Plan. To achieve this goal, MassDEP will focus CWA s.604(b) and s.319 grant funds on NPS assessment, planning, and implementation projects

to develop climate resilient preliminary designs and implementation plans that will address water quality impairments and advance restoration objectives (MassDEP, 2023).

To enable climate resilient planning, MassDEP supports the use of the ResilientMass Action Team (RMAT) Climate Resilience Design Standards Tool (RMAT Tool). The RMAT Tool applies statewide climate projection and hazard data to assess the climate resilience of a project site, assesses the preliminary climate change exposure and risk rating, recommends climate resilience design standards for projects with physical assets, and provides guidance with best practices to support climate resilient implementation. To support the use of this tool for NPS water quality planning and to develop climate-resilient NPS BMP designs, the NPS Management Section is currently developing a supplementary User's Manual.

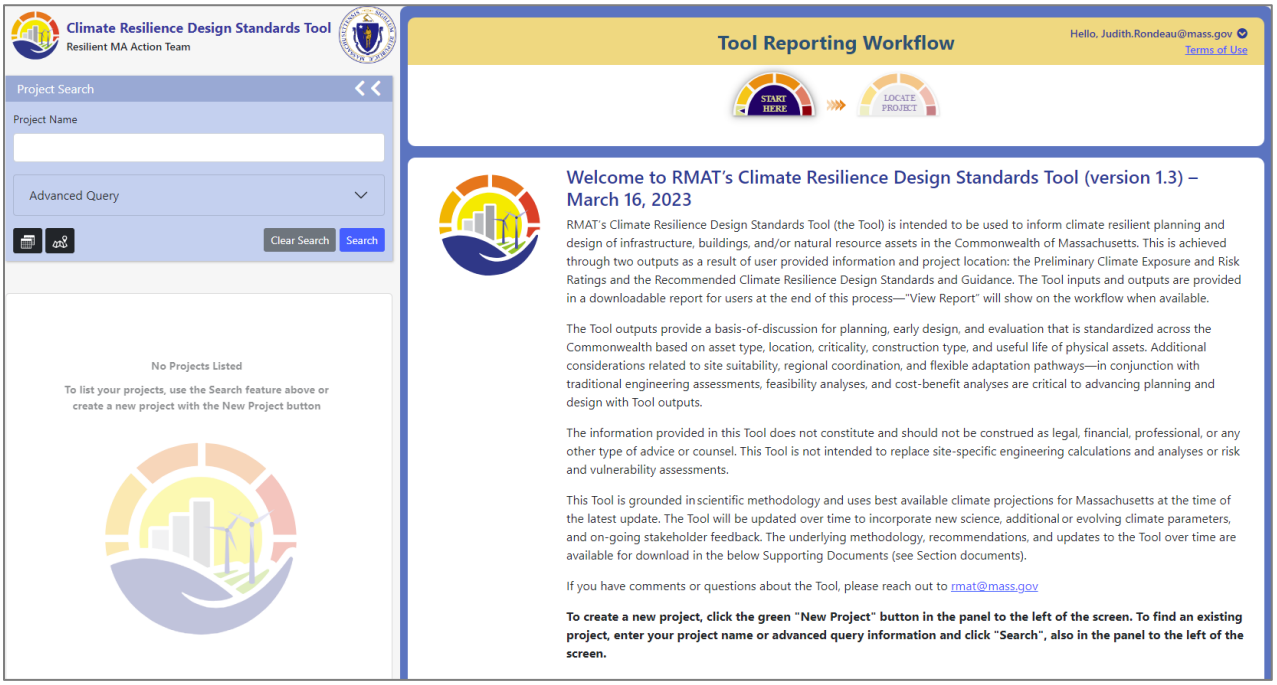


Figure 4.11. *The RMAT Climate Resilience Design Standards Tool user interface.*

To further promote climate resiliency planning for the restoration of impaired waters, the NPS Management Section will foster the capacity-building needs of regional organizations and local communities (see Goal 3), such as a) increasing a community or organization's understanding of how climate change affects NPS pollution and impacts water quality; (b) building technical capacity regarding climate resilient BMP designs, climate resilient planning, etc. and (c) awareness and use of various tools for climate resilient planning (such as the RMAT Tool).

Finally, the NPS Management Section will support initiatives such as the EJ NPS Coordinators program (see Goal 4) to support local communities and to build their capacities for both equity and climate resilient planning and implementation. The existing institutional structure of regional planning agencies (RPAs) and their networks will be leveraged for outreach to EJ communities as well as communities that are differentially affected by climate change. Under the federal Justice40 guidelines, Massachusetts Communities with EJ Populations are eligible to apply for CWA s.319 funds to complete the planning and development of climate-resilient implementation plans.

c) Implementation to Restore or Improve NPS Impairments Caused by Developed Land

MassDEP will support BMP implementations to restore or improve impaired waters through CWA s.319 grants and other funds. BMPs may be structural or non-structural. Structural BMPs are "brick and mortar" management practices that involve construction, installations, earth moving, or planting vegetation. Non-structural BMPs include "institutional" actions that preserve natural systems and existing hydrology, such as conservation planning, policy and regulatory activities, open space preservation, good housekeeping practices, and public education and outreach.

BMPs for Developed Land

BMPs for developed land typically focus on reducing or eliminating NPS pollutants by reducing stormwater runoff volumes and peak flows from impervious areas or treating pollutants in stormwater runoff.

Non-structural practices may include:

- The **adoption of policies, regulations, or ordinances** for conservation planning practices (e.g., cluster development, reduced pavement width, minimized total disturbed areas, protection of environmentally sensitive areas like floodplains, wetlands and stream corridors);
- **Land conservation** and open space preservation;
- **Erosion and sediment control** implementation and enforcement;
- **Good housekeeping practices** to minimize the impacts of NPS (e.g., household, municipal, commercial or industrial materials management, street sweeping, catch basin cleaning, spill prevention and response plans);
- **Recycling and composting**, including rainwater harvesting;
- **Household hazardous waste collections**; and

- **Outreach campaigns** to educate the public about NPS pollutants and encourage the adoption of practices that reduce NPS pollution.

Structural BMPs include, but are not limited to, the following:

- **Erosion control practices** that maintain the integrity of land surfaces to prevent materials from entering stormwater or surface waters (e.g., mulches, erosion control mats and blankets, vegetation establishment and protection, riprap);
- **Stormwater management practices** that reduce stormwater volume and peak rates by capturing and infiltrating stormwater onsite (e.g., pervious pavement, infiltration basins or trenches, bioretention/rain gardens, vegetated swales, drywells);
- **Filtration practices** that treat stormwater to remove pollutants (e.g., biofiltration basins, green roofs, tree filter boxes, stormwater planters, dry swales, sand/media filters, subsurface gravel wetlands, water quality filters, catch basin filters, hydrodynamic separators);
- **Restoration practices** that may slow runoff, remove pollutants, and restore natural functions (e.g., shoreline and riparian buffer restoration, streambed/channel restoration, wetland restoration, floodplain reconnection, landscape restoration); and
- **Other practices** that reduce stormwater volume and/or peak flow (e.g., rain barrels, rooftop runoff cisterns, level spreaders, check dams, filter strips, subsurface detention tanks/vaults).

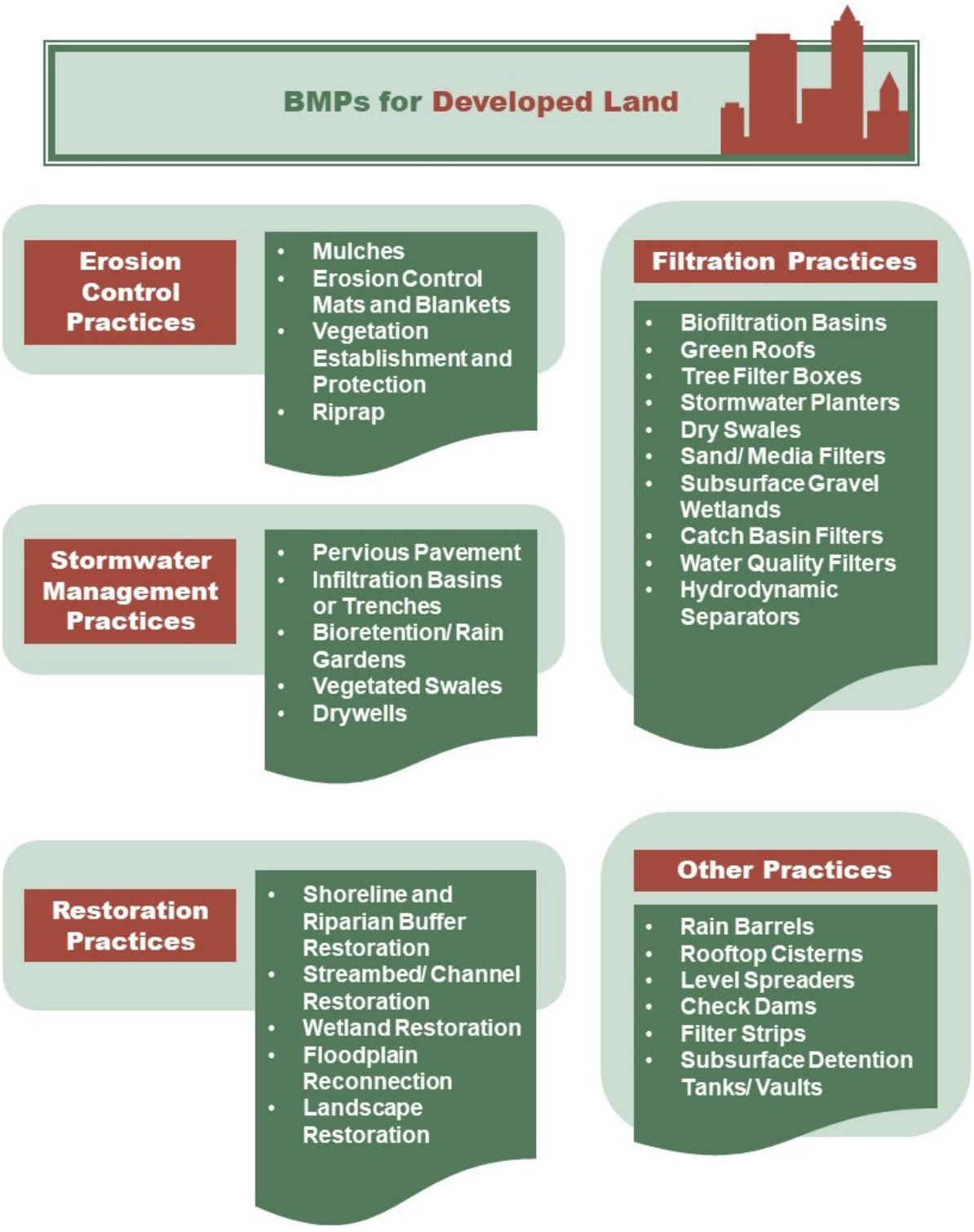


Figure 4.12. *Structural Best Management Practices (BMPs) for Developed Land.*

The Massachusetts Clean Water Toolkit. MassDEP has developed the ***Massachusetts Clean Water Toolkit*** as a primary education tool to identify BMPs and measures to control each NPS category and subcategory. The Toolkit is extensively cross-referenced to other BMP guides, manuals, fact sheets, and applicable specifications that have been proven to be effective. The Toolkit was created for use by municipal officials, residents, and land managers to promote understanding and implementation of the many different options for prevention and control of NPS pollution. The Toolkit is an interactive, web-based document that includes a wide range of BMP fact sheets and a "BMP Selector Tool" that helps users choose the best BMPs for specific NPS pollution problems.

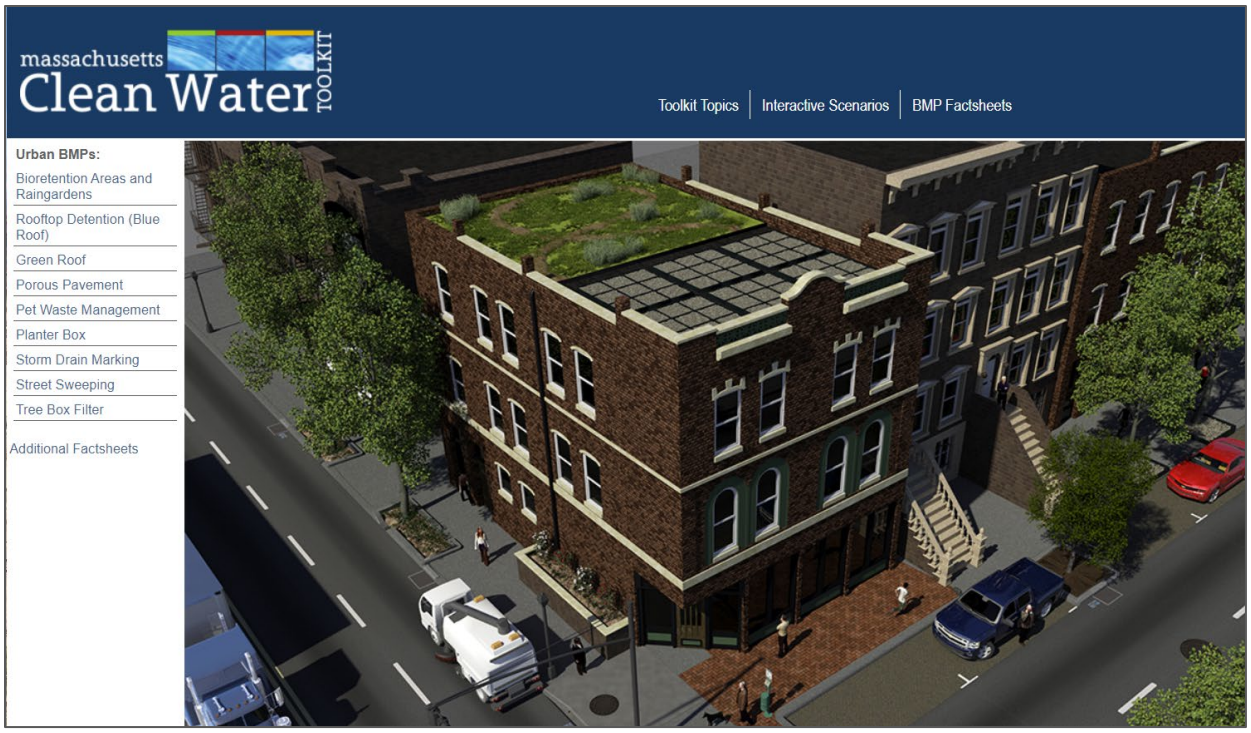


Figure 4.13. *The Massachusetts Clean Water Toolkit, depicting scenarios for Urban BMPs.*

The NPS Management Section plans to update the Clean Water Toolkit to showcase climate resilient, low-impact BMPs and nature-based solutions. The updated Toolkit will also include BMPs recommended for the removal of specific pollutants, such as high-efficiency phosphorus removing BMPs, Best Available Nitrogen Reducing Technology (BANRT), and BMPs for newly added pollutants (e.g., chloride and emerging contaminants).

d) Implementation to Achieve Nitrogen Reduction from Septic Systems

MassDEP will support projects to treat nitrogen from septic systems to restore or improve impaired waters in Nitrogen Impacted Coastal Waters through CWA s.319 grants and other funds. Septic systems are wastewater treatment systems that are installed underground to treat wastewater from homes and other properties that are not connected to a public sewer system. Septic systems separate solids from liquids in a holding tank and discharge the liquid (also called effluent) into a leach field, where it slowly soaks into the ground (see Figure 4.16). Septic systems are onsite sewage disposal systems designed to treat bacteria and other pathogens and some nutrients such as phosphorus but are not as effective at treating more soluble nutrients such as nitrogen. Nitrogen dissolves easily in water and so is transported with otherwise treated effluent into the soil and groundwater table. When nitrogen enters the water table, it can contaminate nearby surface waters and drinking water supplies, including private and public drinking water wells. BMPs to reduce nitrogen from septic systems are identified in the section below.

MassDEP has identified three categories of nitrogen sensitive areas that are eligible for CWA funding: Drinking Water Nitrogen Sensitive Areas (DWNSA), Natural Resource Nitrogen Sensitive Areas (NRNSA), and Additional Areas Eligible for NPS Funding. DWNSAs may be located statewide, while NRNSAs and Additional Areas Eligible for NPS Funding are located in Nitrogen Impacted Coastal Waters.

Drinking Water Nitrogen Sensitive Areas (DWNSA)

DWNSAs are public and private drinking water supply areas that are particularly sensitive to the discharge of pollutants from onsite sewage disposal systems. These include 1) MassDEP-approved Zone IIs for wells or wellfields used by public water systems as defined in the Massachusetts Drinking Water Regulations (310 CMR 22.00) and, in the absence of a Department-approved Zone II, the Interim Wellhead Protection Area for a public water system's well or wellfield as defined in 310 CMR 22.02; and 2) any areas where the use of both onsite systems and wells that are not regulated as public water supplies under 310 CMR 22.00 serve facilities.

Natural Resource Nitrogen Sensitive Areas

MassDEP has designated 30 watersheds in 14 Cape Cod (Barnstable County) towns as Natural Resource Nitrogen Sensitive Areas due to elevated levels of nitrogen pollution (Figure 4.14). The main cause of this pollution is wastewater disposal from septic systems; on Cape Cod, 85% of the nitrogen pollution is attributable to septic systems. MassDEP, in conjunction with local Boards of Health, regulates septic systems through “Title 5” regulations, 310 CMR 15.00. In 2023, MassDEP updated the Title 5

regulations to incorporate new septic system requirements in NRNSAs. Concurrently, MassDEP also promulgated new regulations for the Watershed Permit program (314 CMR 21.00). The newly issued regulations will focus only on Cape Cod watersheds contributing to embayments and estuaries with a USEPA-approved Nitrogen TMDL and that are subject to the Cape Cod Section 208 Area Wide Water Quality Management Plan Update (Cape Cod Commission, 2015). The new regulations require the upgrade of all existing Title 5 systems located in NRNSAs and the use of Best Available Nitrogen Reducing Technologies (BANRT) for new construction unless the municipality files a Notice of Intent or an application for a Watershed Permit or De Minimis Nitrogen Load Exemption. If a town chooses to pursue a Watershed Permit or De Minimis Nitrogen Load Exemption, the amended Title 5 Regulations will not take effect in that watershed.

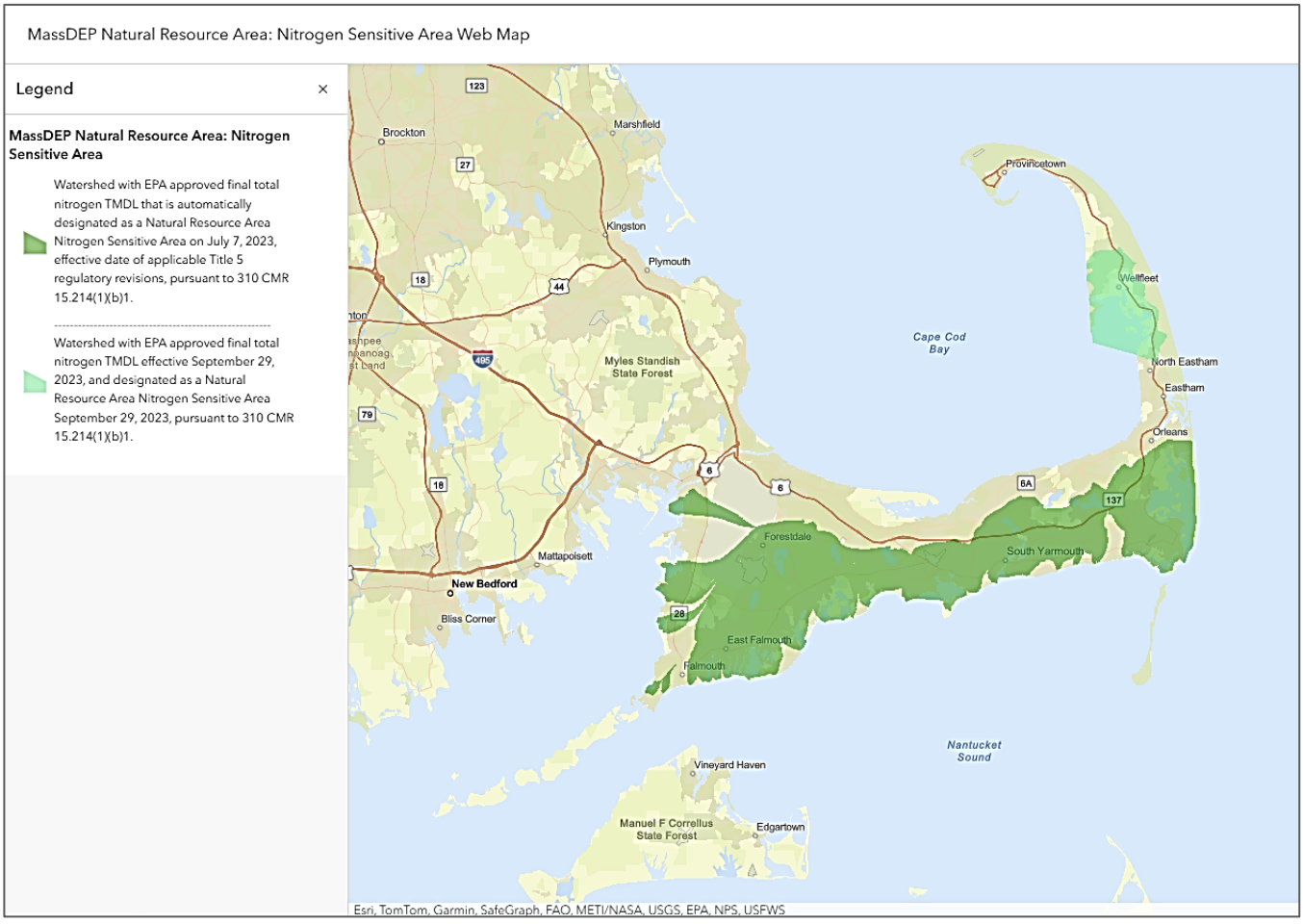


Figure 4.14. *MassDEP Natural Resource Nitrogen Sensitive Areas*

In the Massachusetts NPS Management Plan (2025-2029), MassDEP has expanded state eligibility of the CWA s.319 grant program to include the installation of BMPs to address nitrogen impairment in Massachusetts' Nitrogen Impacted Coastal Waters (Figure 4.15) including the designated NRNSA. Eligible

project components must result in nitrogen load reductions. Further, unless a community is the subject of a Watershed Permit, any septic system serving new construction must incorporate Best Available Nitrogen Reducing Technology (BANRT) as of July 8, 2024, and existing facilities must incorporate BANRT within five years of the effective date of the NRNSA designation of the watershed in which they are located. A BANRT is an alternative system certified by MassDEP for general use pursuant to Title 5, which has the lowest effluent Total Nitrogen performance value. An alternative system granted provisional or pilot approval by MassDEP may also be utilized if such a system has a Total Nitrogen performance value less than or equal to the lowest alternative system certified by the Department for general use (MassDEP, 2022).

Additional Areas Eligible for NPS Funding

Additional Areas Eligible for NPS Funding includes 43 communities in southeast Massachusetts, Cape Cod, and the Islands that contain or intersect watersheds (and/or groundwater recharge areas) identified in MEP Reports (Figure 4.15). These areas do not have approved Nitrogen TMDLs but may benefit from practices to reduce nitrogen from septic systems. The Massachusetts Estuaries Project was initiated in 2001 as a collaborative effort between MassDEP, UMass Dartmouth, and southern Massachusetts communities to determine nitrogen loads to estuaries in southeastern Massachusetts and evaluate load reductions necessary to support healthy ecosystems (MassDEP, 2024). Nitrogen loads modeled by MEP were used to develop TMDLs for many of the estuaries, and technical guidance provided by MEP to support appropriate wastewater, watershed, and embayment management techniques to reduce nitrogen loading has been used by communities to support the development of Comprehensive Wastewater Management Plans (CWMPs).

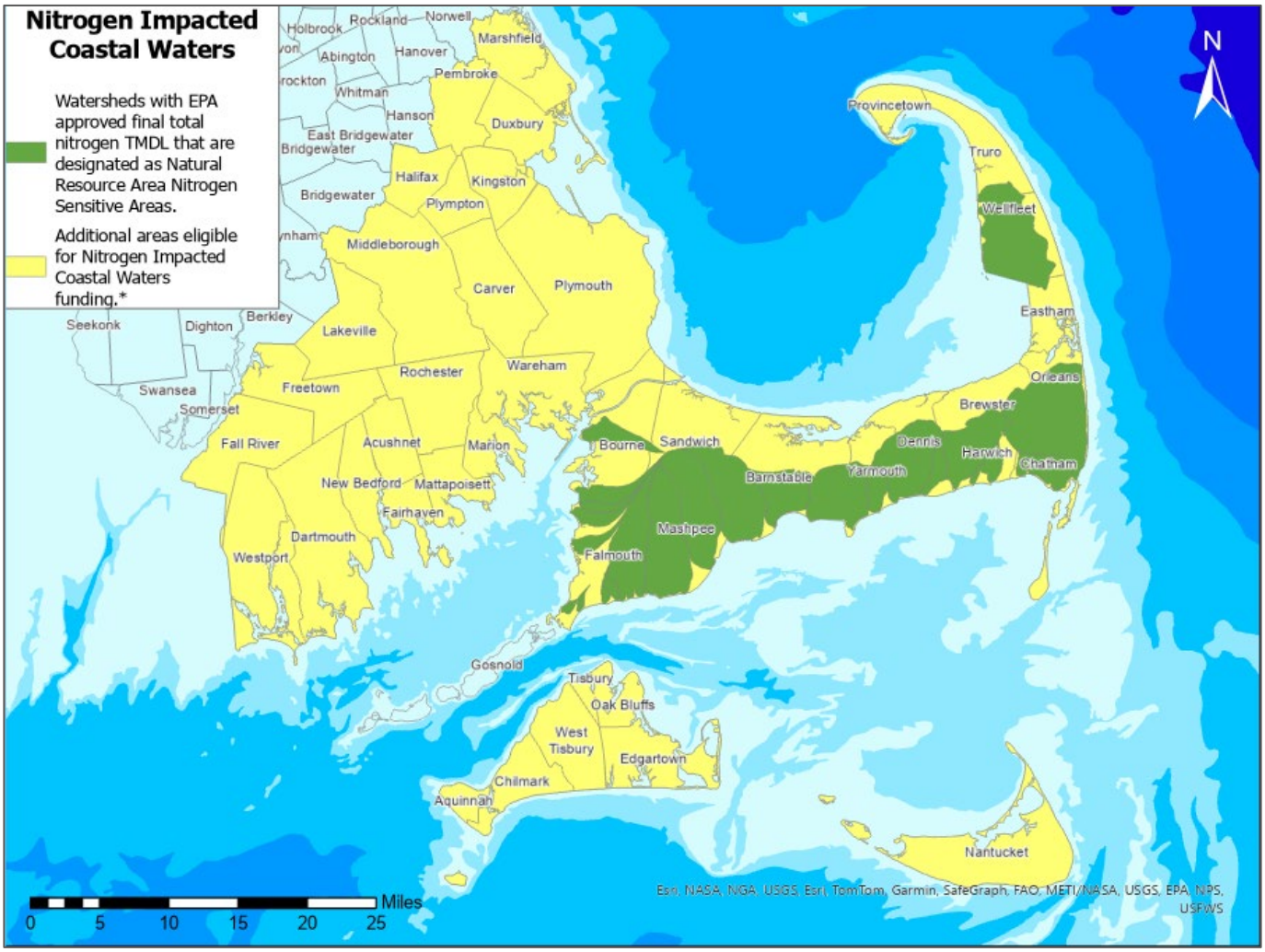


Figure 4.15. *Nitrogen Impacted Coastal Waters (including MassDEP-designated Natural Resource Nitrogen Sensitive Areas). * Additional areas that intersect watersheds identified in MEP Reports and are therefore eligible for Nitrogen Impacted Coastal Waters funding.*

BMPs for Septic Systems

Septic systems, as an NPS major category, account for 14% of NPS-impaired waters in the 2022 Massachusetts Integrated List of Waters (MassDEP, 2023). As stated earlier in this Section, wastewater disposal from septic systems are the main cause of nitrogen pollution on Cape Cod, the Islands, and southeastern Massachusetts; about 85% of nitrogen pollution on Cape Cod is attributable to septic systems. Traditional septic systems (comprised of a septic tank and leach fields), properly installed and maintained, provide effective treatment of pathogens and phosphorus. However, traditional septic systems are less effective at treating nitrogen, due to its high solubility in water. New technologies such I/A septic

systems and permeable reactive barriers (PRBs) show promise for providing advanced nitrogen removal treatment.

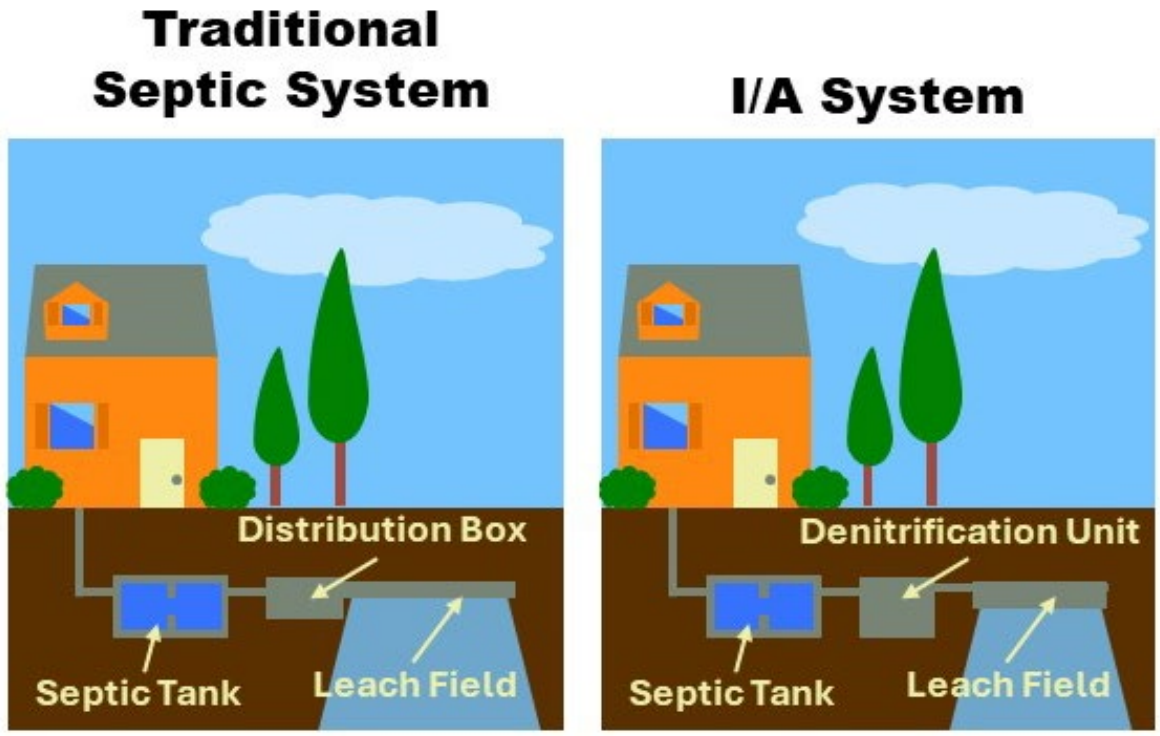


Figure 4.16. *Comparison of a traditional septic system and an innovative/alternative. Not drawn to scale.*

Nitrogen Reducing Innovative/Alternative (I/A) septic systems are septic systems that are specially designed to remove nitrogen. These I/A systems have a denitrification unit located between the septic tank and leach field or may be part of the septic tank, depending on the proprietary system. I/A systems work by converting (NH_4) ammonia into nitrates (NO_3). Denitrifying bacteria use the oxygen in nitrates to break down the septic waste material, leaving nitrogen gas, which is safely released to the atmosphere.

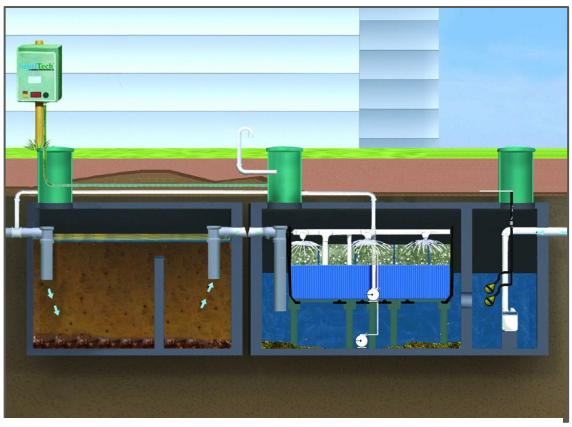


Figure 4.17. *Enhanced I/A septic system. Graphic: SeptiTech/BioMicrobics ®.*

Permeable Reactive Barriers (PRB): A PRB is a deep trench (up to 50 feet deep) or series of large-bore holes that is excavated in the ground to intercept groundwater that flows from a pollutant source. The trench is filled with a reactive material, such as a mixture of sand, mulch, or wood chips, and may contain additives such as limestone, crushed shells, or iron filings. The reactive material and additives depend on the pollutant to be treated. Contaminated water flows through the reactive barrier, where it comes into contact with the reactive material and is treated through a variety of processes including adsorption (the pollutant adheres to the reactive material), precipitation (a process by which metals form a solid mass and are removed from the groundwater), transformation (in which the contaminant interacts with the reactive material to form a less harmful material), and biodegradation (the contaminant is broken down by microbial action) (USEPA, 2021).

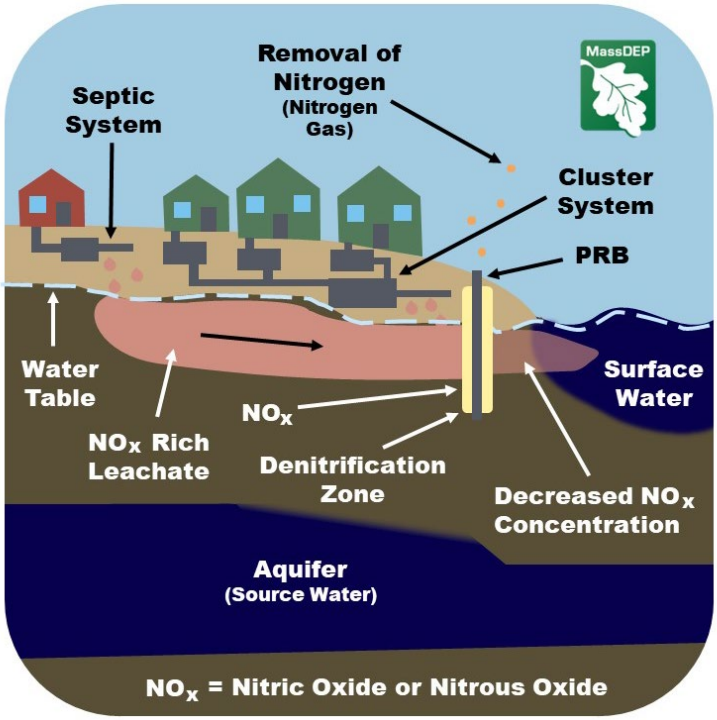


Figure 4.18. *Permeable reactive barrier. Not drawn to scale.*

Urine diversion: Urine diversion systems reduce nitrogen loads by separating urine from the wastewater stream. Diversion devices such as dedicated urinals, specialized toilets, or toilet inserts, divert urine and send it to a urine collection tank. The collected urine can be used as a fertilizer or transported to a wastewater treatment plant for processing. Separating urine from feces improves sanitation by allowing the feces to dry, destroying pathogens (Rich Earth Institute, 2024).

Habitat restoration: Habitat restoration, including the restoration of wetlands and cranberry bogs, can provide significant nitrogen reductions. Wetlands provide a key ecosystem service by filtering pollutants, including nitrogen, from water. Multiple processes within the wetland system act on nitrogen. Plants, algae, and bacteria uptake available nitrogen to grow. Microbes act on various forms of nitrogen to convert it to different nitrogen species and break it down to nitrogen gas, which is released to the atmosphere.

Other BMPs

Recirculating sand filters: Recirculating sand filters remove contaminants in wastewater through a series of physical, chemical, and biological processes. Recirculating sand filters have three components, a pretreatment unit, a recirculation tank, and an open sand filter. Wastewater flows from the pre-treatment tank to the recirculation tank, where effluent from the pretreatment tank and sand filter are mixed and cycled back through the sand filter (USEPA, 1999).

Humus/composting toilets: Humus/composting toilets work by adding carbon-rich material such as wood shavings or sawdust to promote microbial activity that decomposes the solids into compost and destroys pathogens. Some composting toilets separate liquid and solid wastes into different containers. The solids are composted and the collected urine can be used as fertilizer or transported to a wastewater treatment plant for processing.

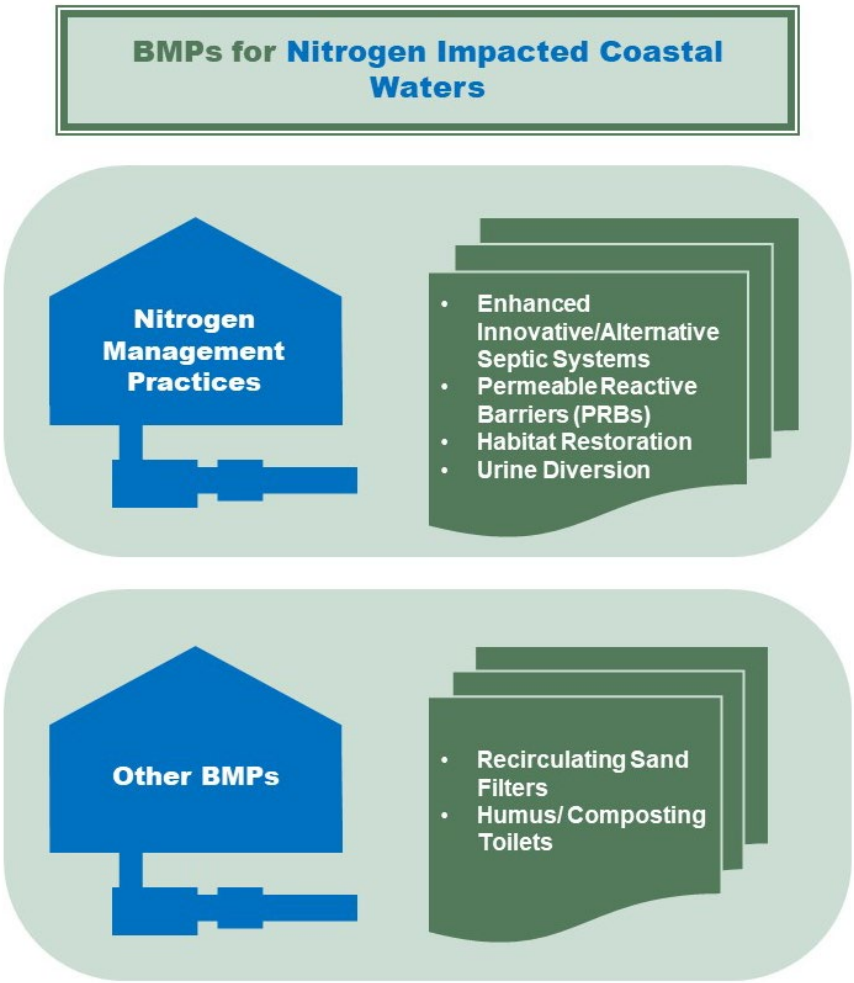


Figure 4.19. *Best management practices (BMPs) for Nitrogen Impacted Coastal Waters.*

e) Implementation to Reduce Agricultural NPS Impairments

As previously described in Section 3 of this Plan, agricultural activity in Massachusetts results in a variety of NPS pollutants, including nutrients, pathogens, sediments, and pesticides. Agriculture, as an NPS major category, accounts for 11% of NPS-impaired waters in the 2022 Massachusetts Integrated List of Waters (2023, MassDEP). BMPs to reduce pollutants associated with agriculture (including aquaculture and forestry) typically fall into several categories including animal/production and animal mortality waste management, stormwater runoff management, pasture management, and crop management.

Non-structural practices may include:

- **Farm management planning** (e.g., Comprehensive Nutrient Management Planning, agriculture chemical application planning);
- **Good housekeeping practices** (e.g., farm equipment cleaning and maintenance, spill prevention and response plans, fertilizer and pesticide application and storage);
- **Crop rotation**;
- **Grazing management**; and
- **Irrigation management**.

Structural practices may include:

- **Waste management** practices (e.g., anaerobic digesters, animal mortality composting facilities, waste separation facility, waste storage facility, waste transfer, waste treatment facility, roofs and covers);
- **Erosion control** practices that maintain the integrity of the land surface to prevent material at the surface from entering stormwater or surface waters (e.g., cover cropping, contour farming, forest trails and landings, heavy use area protection, roof run off structures, grade stabilization structures);
- **Stormwater management** practices that reduce stormwater volume and peak rates by capturing and infiltrating stormwater onsite (e.g. constructed wetlands, diversions, wetland creation, enhancement or restoration);
- **Filtration practices** that treat stormwater to remove pollutants (e.g., contour buffer strips, filter strips, grassed waterways, sediments basins);
- **Pasture/grazing management** (e.g., pasture/hay planting, prescribed grazing, watering facility);
- **Crop management** (e.g., conservation cover, conservation crop rotation, nutrient management, reduced tillage and no-till practices); and

- **Restoration** practices that may slow runoff, remove pollutants, and restore natural functions (e.g., riparian buffers, tree/shrub establishment, stream crossings, stream habitat improvement and management, streambank and shoreline protection);

A full suite and descriptions of USDA NRCS agricultural practices can be found in the NRCS Field Office Technical Guide (FOTG) at https://efotg.sc.egov.usda.gov/#/.

Cranberry bog restoration is a special category of agriculture BMP that involves restoring the natural function of the wetland habitat to reduce legacy pollutants such as nitrogen and pesticides. According to the Massachusetts Department of Fish and Game, Division of Ecological Restoration (DER), "[c]ommon farming practices such as sanding, ditching, and water control structures alter the natural movement and storage of water on the land. The sand layer separates the ground surface from the water table. The result can be a site that is drier than the historic wetland that once existed, and waterways that are disconnected from upstream and downstream areas" (MassDER, 2024). Restoration is accomplished by re-establishing the wetland hydrology by removing water control structures, plugging and filling ditches, breaking apart the cranberry mat, and regrading the wetland to reconstruct stream channels and reconnect the bog to the adjacent uplands.

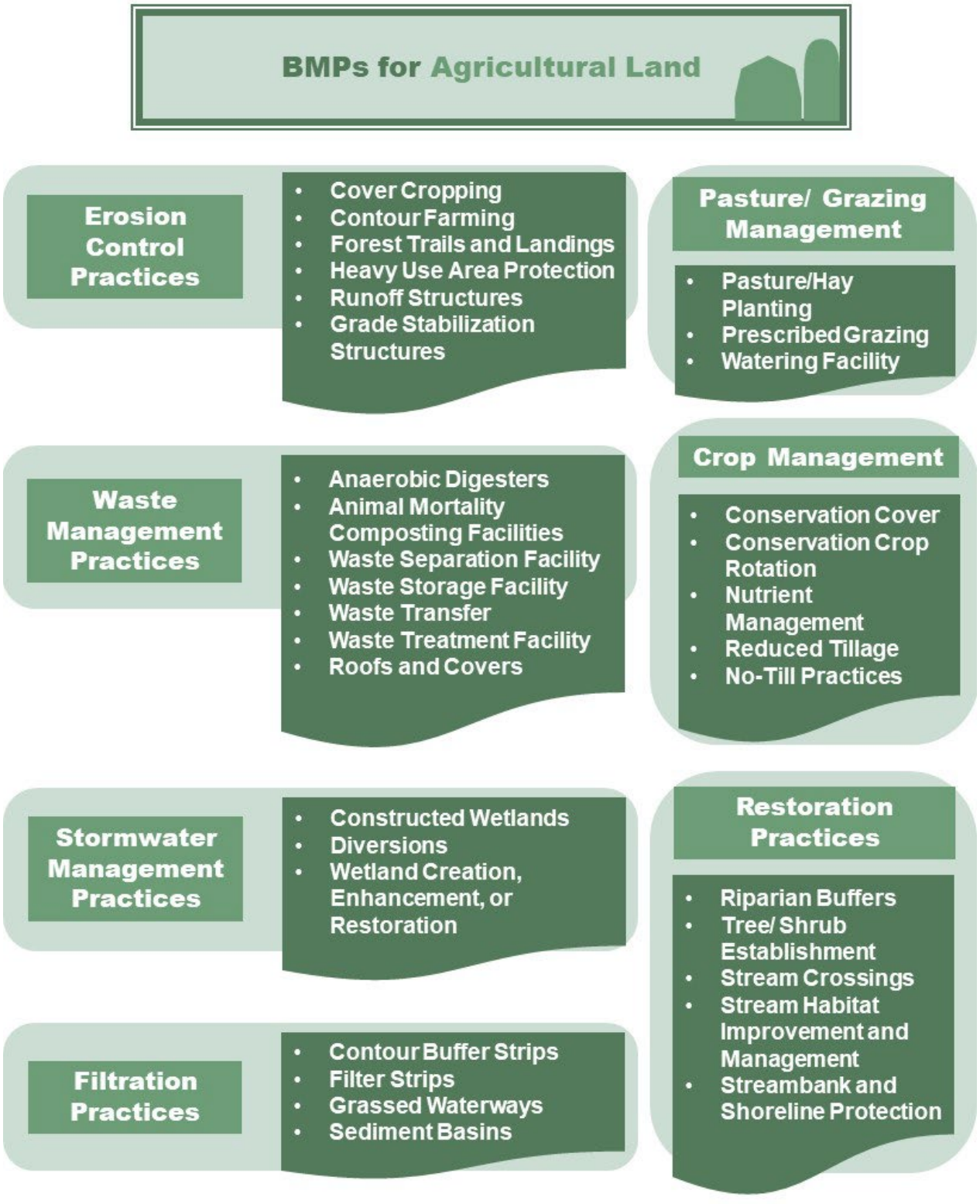


Figure 4.20. *Structural best management practices (BMPs) for agricultural land.*

f) BMPs for Minor NPS Primary Categories

Minor NPS categories include internal cycling, hydrologic and habitat restoration, atmospheric deposition, natural processes, residual management, transportation, marinas and recreational boating, and resource extraction. Many of the BMPs listed for the three major NPS categories (developed land, septic systems, and agriculture), including those designed to capture and infiltrate or filter stormwater runoff, will also treat pollutants from the minor NPS categories. Additional BMPs for minor NPS categories are listed by category below:

- **Internal cycling:** destratification systems, dredging, aeration, alum treatments;
- **Hydrologic and habitat restoration:** flow control structures, streambank/shoreline protection, stream grade stabilization structures, constructed and restored wetlands, stream corridor protection programs (greenbelts/greenways), riparian buffers, floodplain reconnection;

- **Atmospheric deposition:** there are few, if any, BMPs for atmospheric deposition as NPS. The most effective practices occur at the source, focus on pollution prevention practices, and are regulated through permitting processes, including Clean Air Act permits;
- **Natural process (waterfowl and wildlife other than waterfowl):** hazing, culling, habitat management, vegetative cover management, removal of food/foraging sources, public education;
- **Residuals management:** pollutants associated with residuals management are typically regulated through NPDES permits. NPS BMPs include stormwater runoff management, proper residuals handling, storage, and transfer, and spill prevention and response plans;
- **Transportation:** most runoff from transportation systems is regulated through NPDES permits, reducing transportation as a major NPS category; however, other transportation-relation pollutants can be managed through the proper storage, handling and application of deicing materials, proper storage, handling and application of herbicides, road ditch maintenance, street sweeping, catch basin cleaning, dust suppression, erosion and sediment control implementation and inspection, management and restoration of disturbed areas in road right of way, proper species selection and maintenance of vegetative cover, proper handling and disposal of maintenance residuals;
- **Marinas and recreational boating:** vessel maintenance and repair BMPs, sanitary pump out facilities, emergency spill response plans; and

- **Resource extraction:** erosion and sediment control implementation and inspection, stormwater runoff diversion, spoil separation, liner/cap isolation of toxic materials (acid mine drainage, radioactive tailings), proper handling and storage of petroleum products, chemicals and other materials, proper handling and disposal of maintenance residuals, spill prevention and response plans, proper equipment maintenance procedures (Alaska DEC, 2012).

Figure 4.21. *Best management practices (BMPs) for Internal Cycling, Hydrologic and Habitat Modification, Atmospheric Deposition, Natural Process, Residuals Management, and Marinas and Recreational Boating.*

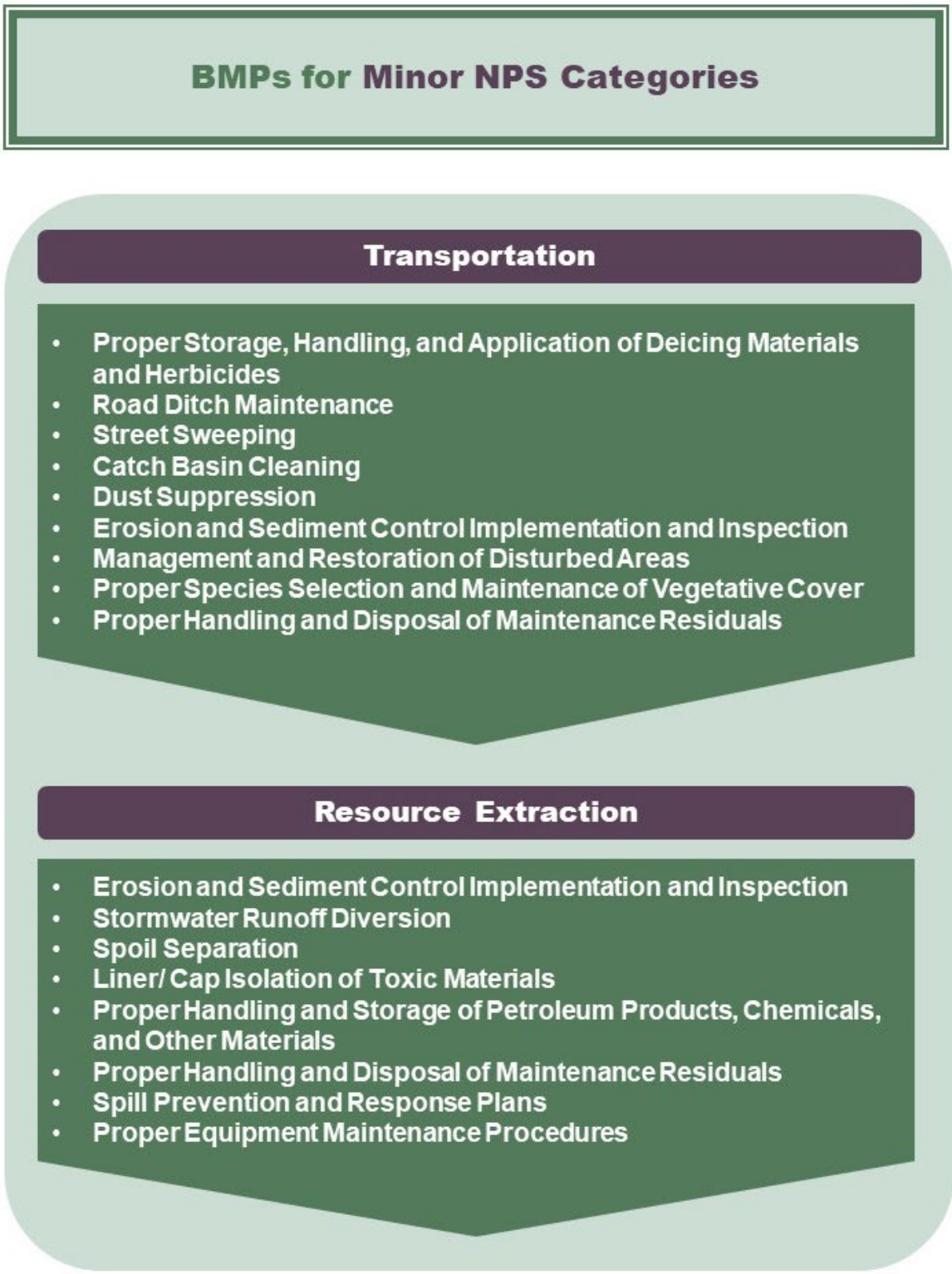


Figure 4.22. *Best management practices (BMPs) for Transportation and Resource Extraction.*

g) Source Water Restoration

Surface water (streams, rivers, and lakes) or groundwater (aquifers) can serve as public water supplies (PWS) and private water wells. Source water may contain contaminants from natural sources or from human activities that must be removed from the drinking water. These contaminants include naturally occurring microorganisms, as well as microorganisms from human activity such as improper management or disposal of human and animal waste; metals from natural sources such as sediment and bedrock, and human activities such as mining, commercial and industrial activities, agriculture, and household uses. Other contaminants include nutrients from the decomposition of natural materials as well as from fertilizers and septic systems and sewage discharges, and organics from pesticides and herbicides, detergents, cleaning chemicals, and commercial and industrial discharges (USEPA, 2011).

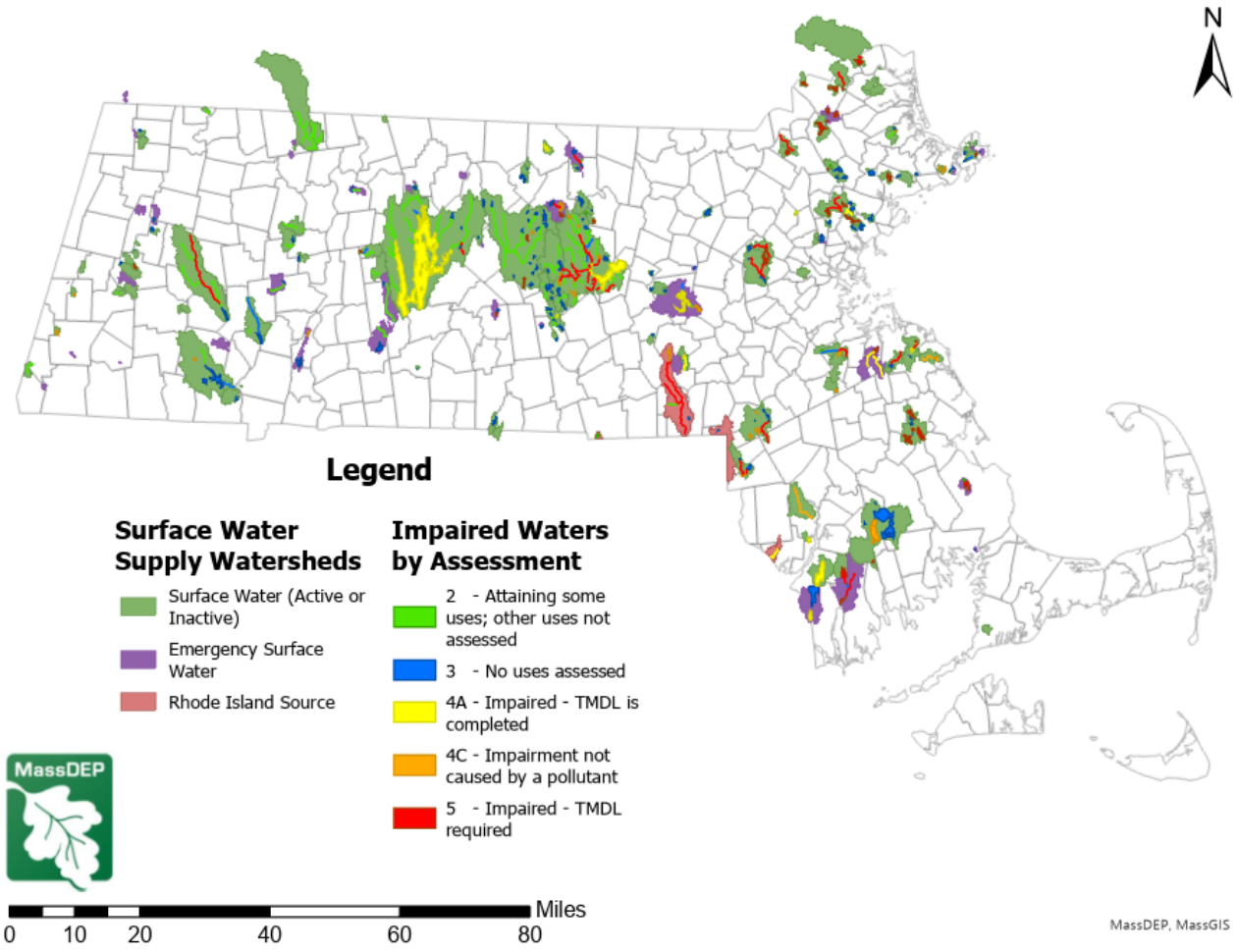


Figure 4.23. *Waterbodies in surface water supply watersheds impaired for one or more designated uses as identified in the 2022 Massachusetts Integrated List of Waters.*

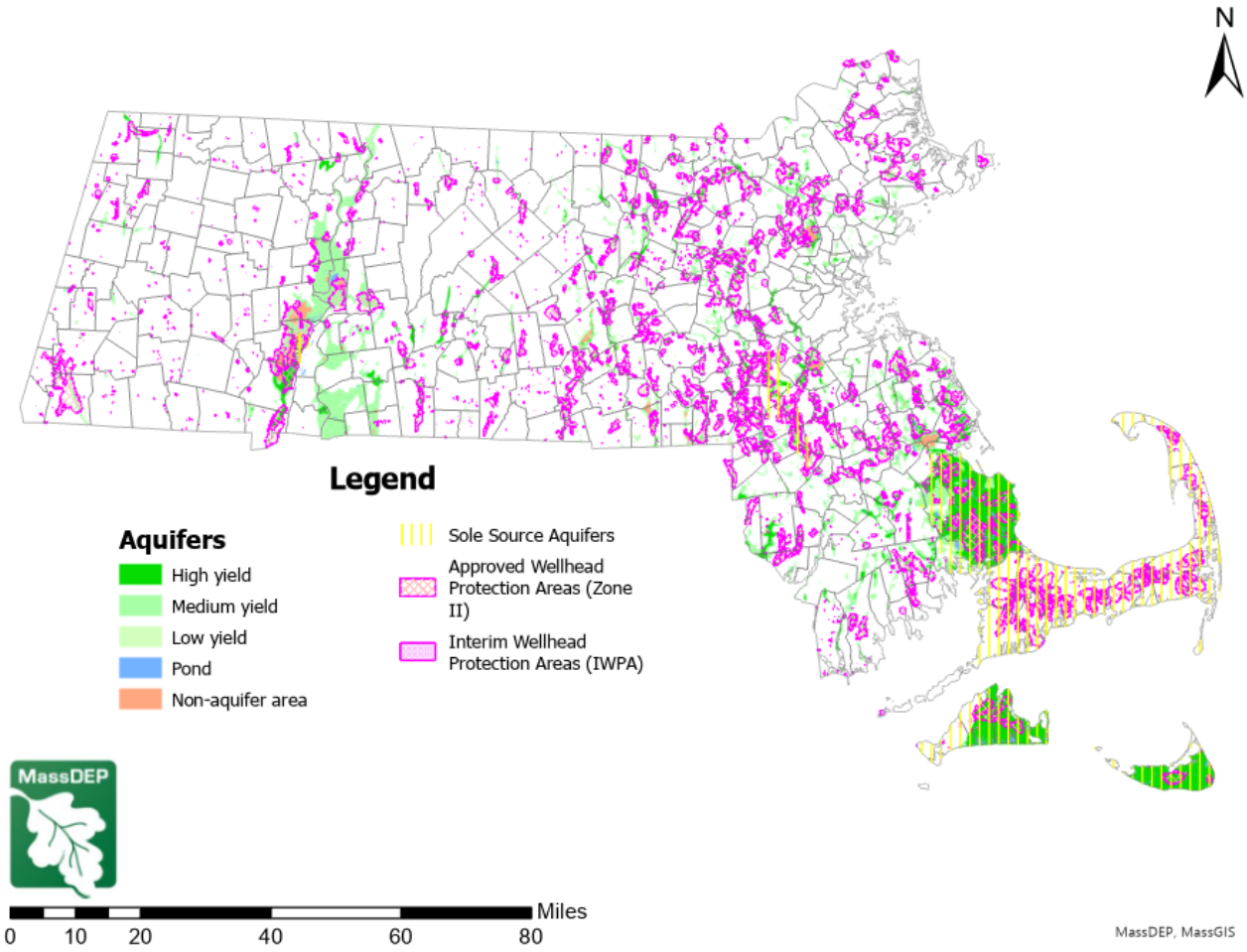


Figure 4.24. *Source groundwater in Massachusetts.*

Most water that is used for public drinking water supplies is treated by public water supply utilities. Protecting source water from contamination can reduce treatment costs and reduce risks to public health from exposure to contaminated water. The top potential threats to public water sources that were identified through the MassDEP Source Water Assessment & Protection (SWAP) Program include residential lawn care/gardening, residential septic systems and cesspools, residential fuel oil storage, stormwater discharge, and state-regulated underground storage tanks. Source water restoration projects will be prioritized for funding through CWA s.604(b) and s.319 grants to identify these and other PWS threats and implement measures to reduce or eliminate NPS pollutants.

Goal 2. Protect healthy waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.

Figure 4.25. *Second goal of the Massachusetts NPS Management Plan (2025-2029).*

Table 4.2 Summary: Table 4.2 provides context for Goal 2 (Protect healthy waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants). Additional information includes actions, relevant primary NPS categories, measurable milestones, and the completion timeline of these milestones. This goal is applicable to all major and minor Massachusetts NPS categories. Goal 2 (Table 4.2) includes:

- Two planning objectives addressing the development of 9e-WBP and climate resiliency planning for all NPS categories (major and minor).
- One implementation objective attributed to the protection of healthy waters from NPS impairment caused by any major or minor NPS categories.
- One implementation objective attributed to source water protection.

Table 4.2. *Goal 2*

Table 4.2. Goal 2. Protect healthy waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.				**Schedule**				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
1. **Protection Planning:** Facilitate the development of MassDEP-accepted 9e-WBPs or a-WBPs to protect healthy waters through NPS watershed projects.	• Use targeted outreach, active and inclusive community engagement, and assistance to protect healthy waters through the development of 9e-WBPs or a-WBPs. • Evaluate 9e-WBPs or a-WBPs . • Provide feedback if modifications are required. • Accept 9e-WBP or USEPA-approved a-WBPs that meet all requirements. • Post accepted WBPs on the MassDEP webpage. • Link MassDEP-accepted WBPs to INSPIRE, MassDEP's NPS Capacity Building Tool for potential applicants and partners.	All	1a. One 9e-WBPs or a-WBPs to protect a healthy water.				1a ☐	
2. **Climate Resiliency Planning in Protection:** Engage local partners on climate change adaptation and resiliency	• Outreach to local partners on methods to incorporate climate change adaptation and resiliency into projects to protect healthy waters	All	2a. One planning project utilizing climate change adaptation and resiliency strategies to protect a healthy water.				2a ☐	

Table 4.2. Goal 2. Protect healthy waters through watershed-based planning and implementation of climate resilient BMPs to reduce NPS pollutants.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
planning to protect healthy waters								
3. **Implementation to Support Healthy Waters:** Prevent and mitigate the movement of NPS pollutants to protect healthy waters	• Support implementation of 9e-WBPs or a-WBPs for protecting healthy waters	All	3a. One healthy water protection implementation project.				3a ☐	
4. **Source Water Protection:** Prioritize projects to protect drinking water sources.	• Work with MassDEP's Drinking Water Program to prioritize implementation projects to protect drinking water sources.	All	4a. One planning or watershed implementation project to protect a drinking water source.					4a ☐

a) Healthy Waters Protection Planning

The objective of the federal CWA is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." While other USEPA programs focus on restoring impaired waters, the Healthy Watersheds Program augments the watershed approach with proactive, holistic aquatic ecosystem conservation and protection. The program includes assessment and management approaches that encourage states, local governments, watershed organizations, and others to take a strategic, systems approach to conserve healthy components of watersheds and, thus, avoid additional future water quality impairments. A healthy, resilient watershed can withstand and/or recover from harmful environmental impacts and can sustain its health and the provision of ecosystem services into the future. For these watersheds, vulnerability to flooding is minimized, hydrologic functionality is maintained, healthy native communities of plants and animals are supported, and water-related uses such as recreation and drinking water are protected and maintained. These watersheds also feature an interconnected network of natural land cover throughout the watershed, especially in the riparian and shoreline zones, providing critical habitat areas and supporting natural flow processes. Healthy and resilient watersheds maintain ecosystem services, such as helping to ensure availability of water for human consumption and industrial use with less treatment costs. The protection of healthy waters is a priority of the Massachusetts NPS Management Plan.

MassDEP recognizes that protecting areas of the state where water quality currently meets or exceeds applicable water quality standards is highly desirable. Proactive protection of healthy waters, particularly those at risk of impacts from NPS pollutants, can be a more efficient use of public funds than the long-term restoration projects that would be needed if the waterbody becomes impaired. MassDEP will direct resources to programs and partnerships that can leverage greater resources to ensure that high-quality and restored waters are not degraded. MassDEP will focus on supporting the USEPA Healthy Watershed Initiative, land conservation projects, stream and watershed stability projects, and climate change adaptation projects with connections to NPS pollution, as detailed in the goals and objectives of the Massachusetts NPS Management Plan. Projects that demonstrate a significant ability to protect existing water quality (including groundwater) will be given consideration under this goal.

MassDEP will establish annual priorities for protection to maximize flexibility for directing funds to meet changing conditions and emerging water quality threats. Annual priorities will be based on the status of surface waters in the Massachusetts Integrated List of Waters, the status of Healthy Watersheds Program projects or identification of new Healthy Watersheds projects, protection of waters removed from the

Massachusetts CWA s.303(d) list of impaired waters (i.e., delisted waters), and priorities and activities of program partners.

b) Climate Resiliency Planning for Protection

The NPS Management Section prioritizes climate resiliency planning for the protection of healthy waters and emphasizes the design of projects to improve the Commonwealth's resiliency to climate change, consistent with the 2018 Massachusetts State Hazard Mitigation and Climate Adaptation Plan. Nature-Based Solutions (e.g., open space preservation, restoration of vegetated buffers, and Low Impact Development stormwater management techniques) can often reduce NPS pollutants and improve climate resiliency and should be considered as part of project planning and implementation. Project proposal designs developed to accommodate changing precipitation and groundwater elevations will be most competitive. MassDEP encourages the incorporation of resiliency and climate planning and adaptation in the design and construction of infrastructure through the utilization of the RMAT Climate Resilience Design Standards Tool during project planning and design. The Design Standards Tool provides Massachusetts' projects with a preliminary climate exposure rating based on best available statewide climate data, recommended resilience design criteria, and technical guidance, allowing users to proactively incorporate climate resilience and adaptation considerations into projects at the design stage.

c) Implementation of WBPs to Protect Healthy Waters

Healthy Water Protection: Proactive NPS management such as healthy watershed protection planning plays a critical role in achieving state and federal NPS Management Section goals, including "(1) protecting healthy waters and watersheds can prevent the need for water quality restoration, as well as help ensure restoration success, (2) implementing protection efforts help maintain healthy watersheds that are resilient to the effects of changes in land use, climate, and other water quality threats, and (3) conducting proactive watershed planning and management can help organize partners and gather support in protecting critical water resources, such as public drinking water supplies (USEPA, 2024)." Protecting healthy waters can safeguard communities from future threats, such as emerging water quality problems, drinking water supply disruptions and health-based violations, fragmentation of aquatic habitat, altered water flow, invasive species, and impacts associated with changing climate conditions (USEPA, 2024). Also, in areas where "healthy waters" are being degraded due to NPS sources, implementation of WBPs can prevent further degradation that would lead to impairment.

CWA s.604(b) and s.319 funds can be used for activities to protect healthy waters. These activities include water quality and watershed assessments, the development and implementation of 9e-WBPs and

a-WBPs, the purchase of conservation easements, leasing land, conservation land acquisition, and the planning, design and implementation of practices to protect or restore water quality.

Source Water Protection: Surface water (e.g., streams, rivers, and lakes) or groundwater (e.g., aquifers) can serve as sources of drinking water, also referred to as source water. Source water provides water for public drinking water supplies and private water wells. Massachusetts has over 1,700 public water systems that provide drinking water to homes, schools, businesses, and industries. Over 90 percent of the state's population depends on public water supply sources, which are often vulnerable to contamination. More than 70 communities have abandoned at least one source because of contamination. Protecting source water from contamination reduces risks to public health from exposure to contaminated water and can reduce water treatment costs.

MassDEP has had a strong water supply protection program since 1980. Federal requirements helped MassDEP focus its resources on improving protection statewide. As a result, local water suppliers and municipal officials received more hydrogeological and planning assistance from MassDEP for improved protection of local drinking water sources (USEPA). WBPs can be used to restore impaired source waters and to protect healthy source waters and can be implemented using CWA s.319 grant funds.

d) Prioritizing capacity building initiatives for Massachusetts Tribes and Communities with EJ Populations

Disadvantaged and marginalized communities have historically lacked the financial and technical resources to manage environmental challenges such as NPS pollution impacts. To best serve Massachusetts Tribes and Communities with EJ Populations, MassDEP needs to understand the current capabilities and capacity needs of these communities. Through the Environmental Justice NPS Coordinator program, MassDEP will create a statewide process to collect information to gain an understanding of local needs. MassDEP will work with EJ Coordinators to provide and prioritize the development of actions to enhance capacity, ensuring Tribes and EJ communities have the opportunity to benefit from the capacity building actions identified in Goal 3 of this Plan.

Goal 3. Build the capacity of communities to mitigate NPS pollution through active and inclusive engagement, outreach, and education.

Figure 4.26. *Third goal of the Massachusetts NPS Management Plan (2025-2029).*

Table Summary: Table 4.3 provides context for Goal 3 (Build the capacity of communities to mitigate NPS pollution through active and inclusive engagement, outreach, and education). Additional information includes actions, relevant NPS categories, measurable milestones, and the completion timeline of these milestones. This goal is applicable to all major and minor Massachusetts NPS categories. Goal 3 (Table 4.3) includes:

- One objective to build core financial capacity to collect the 40% non-federal match for the CWA s.319 grant program to fully waive or partially reduce the match requirement for the sub-awarded projects. The action is to continue with the recently established partnership

with the CWSRF Program or explore new innovative intra or inter-agency financial partnerships to gather the match at the state level.

- One objective to promote and support active and inclusive community engagement as a statewide community engagement and EJ initiative.
- One objective to continue supporting regional capacity building through three NPS Coordinator programs: Regional NPS Coordinators, Agricultural Regional NPS Coordinators, and EJ NPS Coordinators.
- One objective to build technical capacity by maintaining and updating MassDEP's technical capacity building tools, such as INSPIRE, WBP Tool, Clean Water Toolkit, and leveraging other existing tools, such as RMAT Climate Resilience Design Standard Tool.
- One objective to establish a green infrastructure community champions program in Massachusetts.
- One objective to promote and support community youth engagement in NPS implementation projects.

Table 4.3. *Goal 3*

Table 4.3. Goal 3. Build the capacity of communities to mitigate NPS pollution through active and inclusive engagement, outreach, and education.				**Schedule**				
Five-Year Objectives	**Actions**	**Primary Categories**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
1. **Financial Partnerships for Match:** Establish innovative financial partnerships to reduce match for the CWA s.319 grant program.	• Continue collaborating with MassDEP's CWSRF Program to secure non-federal matching funds to reduce/waive match requirements for the sub-awarded 319 projects. • Coordinate with USEPA Region 1 to receive approval of selected SRF projects to be used as nonfederal match	All	1a. Meet annually with MassDEP's CWSRF Program to gather information on eligible NPS projects funded through the recycled SRF. 1b. For each 319 categorical award, submit a letter to USEPA Region 1 with proposed SRF projects to be considered as non-federal match for the 319 funds. 1c. Reduced or waived non-federal match for all 319 RFPs (based on eligible CWSRF projects, the timeline of the s.319 categorical awards, and USEPA's approval of selected projects).	1a ☐ 1b ☐ 1c ☐	1a ☐	1a ☐ 1b ☐ 1c ☐	1a ☐	1a ☐ 1b ☐ 1c ☐
2. **Active and Inclusive Community Engagement:** Promote active	• Create a toolkit for active and inclusive community engagement. • Continue promoting and incentivizing active and inclusive community	All	2a. Completed Equity and Community Engagement Toolkit 2b. Examples of active and inclusive community engagement in the RFPs	2b ☐	2a ☐ 2b ☐	2b ☐	2b ☐	2b ☐

Table 4.3. Goal 3. Build the capacity of communities to mitigate NPS pollution through active and inclusive engagement, outreach, and education.				Schedule				
Five-Year Objectives	**Actions**	**Primary Categories**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
and inclusive community engagement in all planning and implementation projects from start to finish	engagement through RFPs for CWA s.604(b) and 319 grants.		for NPS grants, with substantial points in the selection criteria.					
3. **Massachusetts NPS Coordinators:** Support regional capacity building through three NPS Coordinators programs to develop nine-element WBPs or alternative WBPs and their implementation	• Continue to promote and support the **Regional NPS Coordinators** program to develop nine-element or alternative WBPs. • Continue to promote and support the **Agriculture Regional NPS Coordinators** program to develop nine-element or alternative WBPs. • Continue to promote and support the **Environmental Justice NPS Coordinators** program to develop nine-element or alternative WBPs for restoration directly benefitting Massachusetts's Communities with EJ Populations. • Establish an **NPS Coordinators Cohort** to enable coordination among Massachusetts NPS Coordinators and	All	3a. Three WBPs by the Regional NPS Coordinators. 3b. One WBP by the agriculture Regional NPS Coordinator focusing on urban agricultural impairments 3c. Three WBPs by the Environmental Justice NPS Coordinators. 3d. NPS Coordinators cohort monthly meetings 3e. Five CWA s.319 proposals for implementation projects developed and submitted by the NPS Coordinators or partner towns.	3a ☐3 c☐ 3d ☐	3d ☐	3d ☐	3b ☐ 3c ☐ 3d ☐	3d ☐ 3e ☐

Table 4.3. Goal 3. Build the capacity of communities to mitigate NPS pollution through active and inclusive engagement, outreach, and education.				Schedule				
Five-Year Objectives	**Actions**	**Primary Categories**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
	with MassDEP to promote shared learning.							
4. **Technical Capacity Building Tools:** Provide technical support to inspire new NPS project ideas, development of nine-element or alternative WBPs, and climate resiliency planning	• Encourage the development of new NPS project ideas with INSPIRE, MassDEP's new NPS capacity building tool • Provide technical support to encourage the development of new nine-element WBPs using MassDEP's Nine-Element Watershed Based Plan Tool • Evaluate and update NPS tools (INSPIRE, the Nine-Element WBP Tool, Clean Water Toolkit), as needed • Initiate nine-element WBP training workshop(s) • Encourage climate resiliency planning using the RMAT Climate Resilience Design Standards Tool	All	4a. Annual update of INSPIRE with newly completed projects and WBPs. 4b. Updated Massachusetts WBP Tool. 4c. Free contractor support for WBP development (Communities with EJ populations will be prioritized) 4d. Two nine-element or alternate WBP training workshop(s) 4e. NPS projects-specific user guide for the RMAT Climate Resilience Design Standards Tool 4f. Training Videos for all NPS Tools	4a ☐ 4c ☐	4a ☐ 4b ☐ 4c ☐ 4f ☐	4a ☐ 4b ☐ 4c ☐ 4d ☐	4a ☐ 4b ☐ 4c ☐ 4e ☐	4a ☐ 4b ☐ 4c ☐ 4d ☐
5. **NPS Community Champions:** Evaluate the feasibility of establishing a	• Identify a potential avenue to develop a Green Infrastructure Community Champions program and check feasibility • Use CWA s.604(b) or CWA s.319 grant program funds and targeted outreach to	All	5a. Feasibility outcome report 5b. Massachusetts Green Infrastructure Community Champions program		5a ☐		5b ☐	5b ☐

Table 4.3. Goal 3. Build the capacity of communities to mitigate NPS pollution through active and inclusive engagement, outreach, and education.				Schedule				
Five-Year Objectives	**Actions**	**Primary Categories**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
training program for Green Infrastructure Community Champions in Massachusetts	assist with establishing a Green Infrastructure Community Champions program.							
6. **<u>Community Youth Engagement:</u>** Promote and support community youth engagement in NPS projects.	• Identify potential avenues to promote and incentivize community youth engagement in NPS projects.	All	5a. Videos showing community youth engagement in NPS implementation projects		5a ☐		5a ☐	5a ☐

a) Financial Partnerships

The CWA s.319 grant funding awarded by EPA to Massachusetts annually requires a non-federal match of at least 40%. At the project level, if the total cost for a proposed project was $100,000, the applicant may request grant funds of 60% ($60,000) and MassDEP would historically require the applicant to supply the remaining 40% ($40,000) of the total project cost as a match. The 40% match may be provided as cash or as an in-kind contribution. In-kind services must be calculated based on the actual cost of the service provided. Cost estimates for in-kind services must be reasonable, and applicants must be able to provide documentation upon request. CWA s.319 funding cannot be used as a non-federal match for any other federally funded grant program or project. Projects considered for non-federal match must meet the same CWA s.319 eligibility guidelines as grant-funded work.

In 2023, as a core financial capacity building initiative, the NPS Management Section in MassDEP's Watershed Planning Program established a partnership with MassDEP's CWSRF Program to gather the 40% non-federal match for CWA s.319 project funds at the state level. The CWSRF is the nation's largest fund dedicated to the purpose of water quality problems. Approximately 90% of CWSRF dollars are directed to point source needs, primarily large infrastructure projects such as sewer and water infrastructure installation and upgrades. These types of projects will continue to be foundational to CWSRF because few other programs can provide the funds required for similar projects. Three out of four water quality impairments are attributed to NPS pollution, but less than 4% of CWSRF funds are used to address NPS needs (USEPA, 2021). The USEPA Best Practices Guide for Financing Nonpoint Source Solutions (2021) provides guidance on understanding NPS and CWSRF program eligibilities and integrating both programs.

Eligible NPS projects funded by the recycled CWSRF funds that fit the timeline of MassDEP's FFY 2023-2024 CWA s.319 awards were leveraged as the 40% non-federal match for projects. This successful partnership allowed MassDEP's NPS Management Section to waive the match requirements for all awardees for the FFY2023-2024 funding cycle. The NPS Management Section will coordinate with the CWSRF Program and explore new financial partnerships to continue this initiative in future funding cycles; however, the match waiver or reduction will be at MassDEP's discretion and will depend on the availability of eligible projects and funds. Applicants were advised that proposals under the FFY2023-2024 RFP were not required to provide the match, but the voluntary inclusion of a non-federal match with cash or in-kind services would provide applicants with a competitive advantage in the selection process. In the event the NPS Management Section is able to secure only a portion of the 40% non-federal match for any grant

cycle, it may choose to waive match for a select group of applicants, such as Tribes or Communities with EJ Populations, or it may offer a reduced match for all applicants.

The NPS Management Section will continue to explore mechanisms to integrate the state CWSRF and NPS Management programs (elaborated in Goal 4.6).

b) Active and inclusive community engagement

MassDEP's NPS Management Section highly encourages robust and inclusive community involvement through active engagement in projects funded by CWA s.604(b) and s.319 grants. Initiatives that will enhance equity and facilitate the participation of disadvantaged community (DAC) members in the stewardship of local natural resources will be highly prioritized. Project proposals must include a plan to involve the community through active engagement. Examples of active engagement include:

- Solicitation of community input in all phases of the grant project;
- Incorporation of NPS projects into school curricular and/or extracurricular activities such as environmental clubs, science exhibitions, and/or field trips;
- Activities that engage community youth such as development of education and outreach material;
- Partnerships with local organizations;
- Neighborhood/watershed clean-ups associated with the grant project;
- Other community events associated with the grant project that will result in meaningful and impactful outcomes, such as increased stakeholder knowledge and understanding and neighborhood-scale adoption of BMPs;
- Community engagement via programs such as Photo-Voice;
- Information sharing through meetings or community workshops; and
- Site tours with community members.

Additionally, applicants are encouraged to illustrate how their project would facilitate the participation of DAC members, such as:

- The translation of project materials and signage into languages relevant to the community to be more inclusive of all members;
- A plan to have language interpreters at meetings; and
- A plan to provide accommodations for community members with disabilities.

The NPS Management Section is developing an Active and Inclusive Community Engagement Toolkit to assist grantees with developing active and inclusive community engagement for their projects.

c) Massachusetts NPS Coordinators

The NPS Management Section developed the NPS Coordinator program to provide a regional-scale support system for communities that lack the technical capacity and/or expertise to plan and implement CWA s.604(b) and s.319 projects. Massachusetts NPS Coordinators are grant subrecipients or contractors who assume the role of a coordinator relevant to the following project types: (a) Environmental Justice NPS Coordinator program, (b) Regional NPS Implementation Project Development, or (c) Agriculture Regional NPS Implementation Project Development. Since the management of NPS pollution is most effective at the watershed scale, recruiting regional scale organizations to coordinate the mitigation of NPS pollution through grant funding is important to foster environmental stewardship and promote continuing action to address NPS pollutant sources and impacts.

The **Environmental Justice NPS Coordinator Program** was created under MassDEP's new non-implementation project type, Environmental Justice Capacity Building. This new initiative seeks proposals from RPAs and local community-based organizations which engage with and/or form partnerships to benefit Massachusetts' EJ communities, and other eligible not-for-profit entities, for capacity-building work amongst DACs to ensure equitable and fair access to the benefits of the Massachusetts NPS Management Section. Grant subrecipients under this initiative will serve as Environmental Justice NPS Coordinators (EJ Coordinators) and will be expected to carry out NPS-focused capacity-building work in and for DACs and meaningfully engender environmental stewardship in these communities. This work will include engaging local communities through robust outreach and education, training, capacity building, development of WBPs, supporting or undertaking the development and submittal of high-quality proposals for future CWA s.319 implementation projects and other grants that can serve as a source of non-federal match. Activities that address the requirements of NPDES MS4 permits are expressly excluded from EJ Coordinator responsibilities. MassDEP or its representatives will provide training, tools, and support for EJ Coordinators. Prospective EJ Coordinators should outline local community needs and priorities, connection to the local DAC(s), identify any high-priority areas, identify whether new or existing staff have the potential to carry out the grant duties, and outline the activities and outcomes to be expected, as well as any specific needs for training.

The **Regional NPS Implementation Project Development** initiative seeks proposals from Regional Planning Agencies and other eligible not-for-profit entities for contract services supporting the Massachusetts NPS Management Section. Contractors involved in these projects will serve as Regional Nonpoint Source Coordinators. They will be expected to carry out NPS-focused work, including outreach and education, identification of regional NPS priorities, development of WBPs, supporting or undertaking the development and submittal of high-quality proposals for funding under CWA s.319 or other grants that can serve as CWA s.319 eligible non-federal match. Activities that address the requirements of NPDES MS4 permits are expressly excluded from RC responsibilities. MassDEP or its representatives will provide training, tools, and support for RCs. As each region will vary in NPS needs, proposals should outline the regional NPS needs and priorities, identify any high-priority areas, identify whether new or existing staff will carry out the new NPS duties, and outline the activities and outcomes to be expected, as well as any specific needs for training. RCs will be expected to attend monthly virtual RC meetings led by MassDEP.

Through the **Agriculture Regional NPS Implementation Project Development** initiative, MassDEP seeks proposals from regional conservation districts and other eligible not-for-profit entities doing work in Berkshire, Franklin, Hampshire, Hampden, and Worcester counties, for contract services in support of the NPS Management Section. Contractors will serve as regional agricultural Nonpoint Source Coordinators and will be expected to carry out agriculture related NPS-focused work, including: identification of regional agricultural NPS priorities, development of WBPs, supporting or undertaking the development and submittal of high-quality proposals for funding under CWA s.319 or other NPS partner programs, outreach and education, and any other activities that will further the goals of the Massachusetts Nonpoint Source Management Plan. MassDEP or its representatives will provide training, tools, and support for regional coordinators (RCs). As each region will vary in agricultural NPS needs, proposals should outline the regional NPS needs and priorities, identify any high-priority areas, identify whether new or existing staff will carry out the new NPS duties, and outline the activities and outcomes to be expected, as well as any specific needs for training.

The NPS Management Section will establish an NPS Coordinators cohort to support the NPS coordination and shared experience-based learning.

d) Massachusetts NPS Technical Capacity Building Tools (MassDEP Website)

MassDEP will provide technical support to inspire new NPS project ideas, the development of nine-element or alternative WBPs, and climate resiliency planning through existing and new capacity building tools.

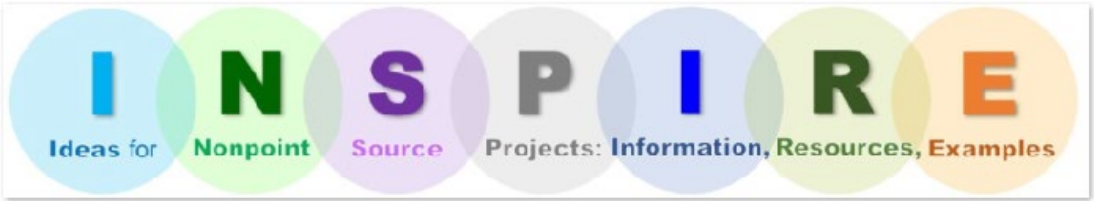


Figure 4.27. *Ideas for Nonpoint Source Projects: Information, Resources, Examples.*

MassDEP developed INSPIRE as an online GIS-based capacity building tool. This powerful tool showcases and shares information about the CWA s.604(b) and s.319 grant projects throughout the Commonwealth and presents a collection of geospatial layers as resources to help communities develop new project ideas for competitive grant proposals. Users can utilize this tool to identify relevant spatial data such as watersheds, rivers, lakes, wetlands, political and administrative boundaries, Massachusetts EJ populations, and the MassDEP Integrated List of Waters (303(d)/305(b) list) in proximity to the area of interest. Users can also add their own data to customize a visualization to their specific needs. This tool will directly benefit potential CWA s.604(b) and s.319 grant applicants by providing geospatial information to investigate and visualize ideas for the development of successful NPS grants. With INSPIRE, NPS Management Section staff can assess project data to evaluate grants relative to specific criteria, such as the number and/or types of projects located in a specific town, region or congressional district and to view the geographic distribution of NPS-funded grant projects relative to other GIS data, such as Environmental Justice Populations in Massachusetts.

The **Massachusetts WBP Tool** guides users to develop a watershed-based plan in three easy steps. This online tool provides a template that is linked to Massachusetts land use and land cover data, water quality assessment reports, TMDLs, the 2022 Massachusetts Integrated List of Waters, and guides users through the plan development process with a series of prompts. The tool calculates estimated NPS pollutants based on watershed land use and pre-loaded pollutant load export rates. In 2024, MassDEP revised the WBP Tool to increase usability by updating the land use data, and including a feature that delineates the target watershed based on a pourpoint

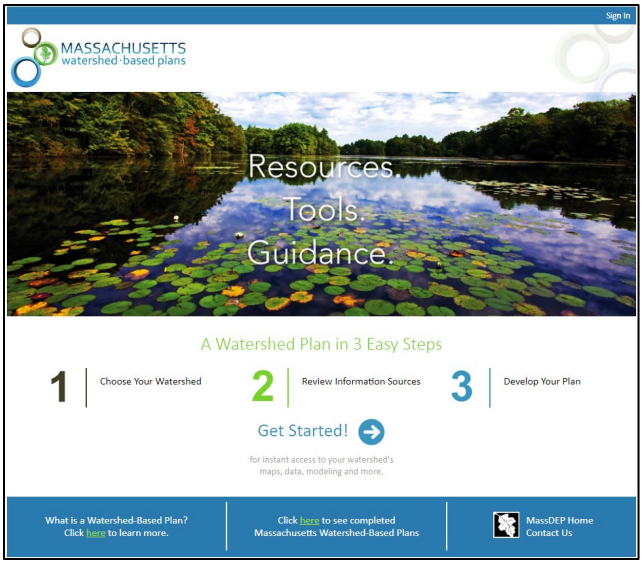


Figure 4.28. *Massachusetts WBP Tool website interface.*

selected by the user, and allows the user to upload their own watershed. The WBP template was also updated and new prompts were added to aid users in plan development. MassDEP provides guidance for the use of the WBP Tool on its Nine-Element Watershed-Based Plans Information webpage. A link to the WBP Tool is available on the WBP webpage, as is general information about USEPA 9e-WBPs and links to MassDEP-accepted 9e-WBPs. To support the WBP Tool, MassDEP will initiate 9e-WBP workshops to train users not only how to use the tool, but to develop thorough and robust WBPs.

Climate Resilience Design Standards Tool

As described in Goal 1, MassDEP supports the use of the RMAT Climate Resilience Design Standards Tool. To enable climate resilient planning, the RMAT Tool applies statewide climate projection and hazard data to assess the climate resilience of a project site, assesses the preliminary climate change exposure and risk rating, recommends climate resilience design standards for projects with physical assets, and provides guidance with best practices to support climate resilient implementation. To support the use of this tool for NPS water quality planning and develop climate-resilient NPS BMP designs, the NPS Management Section has developed a supplementary User's Manual customized for NPS implementation projects.

Massachusetts Stormwater Handbook

The 2008 Massachusetts Stormwater Handbook describes stormwater management regulations, standards and designs. The Handbook is being updated in 2024 and will be released in 2025. New measures will more closely align Wetlands Protection Act (WPA) management standards in wetlands areas with MS4 General Permit stormwater rules. These measures are expected to provide consistency between federal and state regulations, simplify the stormwater permitting process, and help the 260 MS4 communities meet the MS4 deadline to adopt local rules that meet the USEPA's Minimum Control Measures. Alignment of the stormwater regulatory frameworks will also provide benefits that improve resilience for wetland ecosystems and for drainage and transportation infrastructures under changing climate conditions.

Massachusetts Clean Water Toolkit

The Massachusetts Clean Water Toolkit is an online representation of the 1993 MassDEP Nonpoint Source Pollution Guidance Manual and Technology Assessment Resource Tool, commonly referred to as the "MegaManual". The MegaManual was intended to provide guidance to municipal officials on how best to manage NPS pollution to surface waters. However, due to the document's format, volume, limited distribution, and organizational structure, MassDEP observed that this document was not reaching a broad audience, being used effectively, or reflecting the latest information on technologies and management strategies. The MegaManual was reformatted as an online modular, searchable document renamed the “Clean Water Toolkit.” The toolkit features downloadable chapters, 159 fact sheets on BMPs (including design schematics), numerous web links to additional information resources, and a searchable glossary of terms. A feature of the Clean Water Toolkit is the "BMP Selector Tool," an interactive database that helps users select management techniques for specific NPS pollution problems or sites. The Selector Tool guides users through a series of questions to produce a targeted collection of BMP fact sheets from the Toolkit's inventory, thereby allowing users to rapidly access information specific to their unique project requirements. MassDEP will evaluate and update the Clean Water Toolkit as needed.

e) Community Champions

MassDEP will evaluate the feasibility of establishing a training program for Green Infrastructure Community Champions in Massachusetts to create a cohort of trained volunteers to implement green infrastructure at the community scale. MassDEP will identify a potential avenue to develop a Green Infrastructure Community Champions program, including identifying potential academic partners, and investigate the feasibility of creating such a program using CWA s.604(b) or s.319 grant program funds and targeted outreach to assist with establishing the program.

f) Community Youth Engagement

MassDEP will promote capacity building through community youth engagement in NPS projects. The NPS Management Section will continue to support meaningful engagement that provides various age

groups with suitable opportunities to participate in NPS implementation projects in their communities. Community youth engagement in NPS Restoration projects is driven by shared goals, such as improved environmental conditions, inspiring active learning through critical thinking, hands-on skill building, sharing their ideas and opinions in a manner that informs decision-making, and engaging in partnership and/or shared leadership. Youth engagement may include activities such as participation in the site selection, design and implementation of BMPs, project documentation and report preparation, development of outreach campaigns and materials, and peer education.

Goal 4. Enhance NPS pollution mitigation for Tribes and Communities with Environmental Justice Populations.

Figure 4.29. *Fourth goal of the Massachusetts NPS Management Plan (2025-2029).*

Table 4.4 Summary: Table 4.4 provides context for Goal 4 (Enhance NPS pollution mitigation for Tribes and Communities with Environmental Justice Populations). Additional information includes actions, relevant NPS categories, measurable milestones, and the completion timeline of these milestones. This goal is applicable to all major and minor Massachusetts NPS categories. Goal 4 (Table 4.4) includes:

- One objective attributed to understanding the variable equity and climate adaptation needs at the local level for Massachusetts Tribes and Communities with EJ Populations.
- One objective to prioritize Massachusetts Tribes and Communities with EJ Populations to receive the benefits of the capacity building initiatives mentioned in Goal 3.
- One objective attributed to enhancing accessibility of the NPS funding for the communities of the EJ Populations.
- One objective attributed to enhancing accessibility of NPS funding for Massachusetts Tribes and to gain an increased understanding of tribal ecological knowledge and nature-based practices.

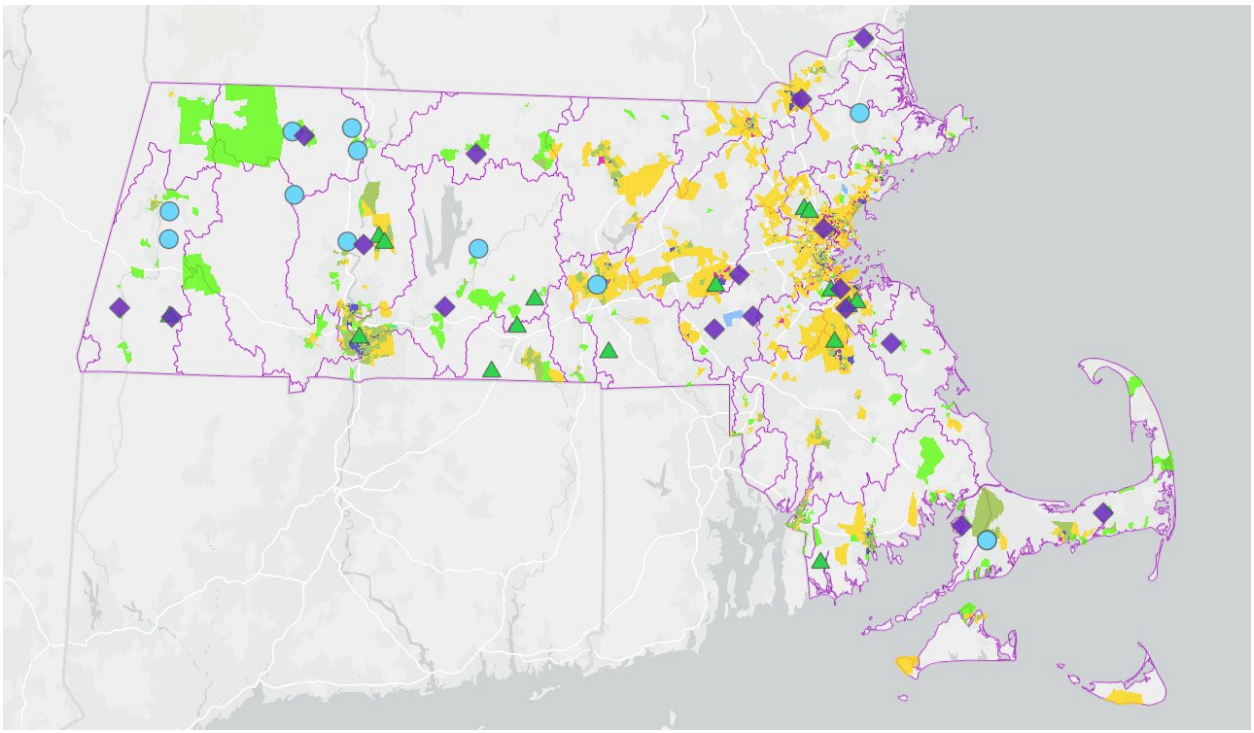


Figure 4.30. *Massachusetts NPS 604(b) and 319 grants awarded between the years 2019 and 2022, overlayed with the state's areas with EJ populations. Data as of 8-26-2024.*

Of the 50 projects funded by CWA s.604(b) and 319 grants in Massachusetts between 2019 and 2022, 23 projects occurred in Communities with EJ Populations. The awards for these 23 projects total $2,500,014.00, which is approximately 43% of the total funding awarded during this four-year period.

Table 4.4. *Goal 4*

Table 4.4. Goal 4. Enhance NPS pollution mitigation for Tribes and Communities with Environmental Justice Populations.				**Schedule**				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
1. **Community Needs Assessment:** Identify equity barriers and needs from regional to local levels through community needs assessments	• Through the EJ NPS Coordinators Cohort, create a statewide template to conduct Community Needs Assessments to understand local needs and to increase NPS restoration benefiting Massachusetts Tribes and Communities with EJ Populations. • EJ NPS Coordinators will conduct the Community Needs Assessments.	All	1a. Community Needs Assessment Reports as a deliverable of the Environmental Justice NPS Coordinator projects			1a ☐	1a ☐	
2. **Prioritized Capacity Building:** Prioritize Tribes and Communities with EJ Populations to receive all capacity building initiatives listed in goal.	• Prioritize Tribes and Communities with EJ Populations to receive the benefits of all actions listed in Goal 3.	All	2a. One 9e-WBP developed with support provided by MassDEP's NPS Management Section 2b. One climate resiliency plan benefitting Tribes or Communities with EJ Populations using the RMAT Climate Design and Standard Tool.			2a ☐	2b ☐	2c ☐

Table 4.4. Goal 4. Enhance NPS pollution mitigation for Tribes and Communities with Environmental Justice Populations.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
			2c. Five implementation projects benefiting Tribes or Communities with EJ Populations.					
3. **Enhanced EJ Accessibility:** Enhance the accessibility of MassDEP's NPS funding to Communities with EJ Populations	• Continue and enhance targeted outreach to Communities with EJ Populations on grant funding opportunities and new EJ flexibilities in grant programs.		3a. Targeted outreach, including discussions with organizations that serve Communities with EJ Populations 3b. Incorporation of EJ flexibilities into CWA s.604(b) and s.319 grant programs	3a ☐ 3b ☐	3a ☐	3a ☐	3a ☐	3a ☐
4. **Enhanced Tribal Accessibility and Shared Knowledge:** Enhance the accessibility of MassDEP's NPS funding to Tribes and enhance shared knowledge on nature-based solutions.	• Establish sustained, targeted outreach to Massachusetts Tribes to communicate grant funding opportunities and new flexibilities. • List Tribal NPSMP Plan as MassDEP-accepted WBP. • Establish sustained, targeted outreach to Massachusetts Tribes to gain an increased understanding of tribal indigenous knowledge and learn about tribal experiences with Nature-Based Solutions	All	4a. Targeted outreach, including discussions with Massachusetts Tribes and their partner organizations. 4b. Tribal NPSMP Plans as MassDEP-accepted WBP 4c. One project that implemented Tribal NPSMP to	4a ☐	4a ☐ 4c ☐	4a ☐ 4b ☐	4a ☐	4a ☐ 4c ☐

Table 4.4. Goal 4. Enhance NPS pollution mitigation for Tribes and Communities with Environmental Justice Populations.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
			partially restore impaired water. 4c. A report documenting tribal experiences with Nature-Based Solutions and how those could enhance climate resilient NPS restoration and protection					

a) Community Needs Assessments

MassDEP's NPS Management Section will create a statewide process to collect information to understand the equity and climate resiliency needs perceived by the Massachusetts Tribes and Communities with EJ Populations. To achieve NPS Pollution mitigation, the capacity needs of these communities, as well as their existing capacities, will be assessed through the EJ NPS Coordinator Program cohort.

b) Prioritizing capacity building initiatives for Massachusetts Tribes and Communities with EJ Populations

MassDEP will work with EJ NPS Coordinators to develop and prioritize actions to enhance capacity, ensuring Massachusetts Tribes and Communities with EJ Populations have the opportunity to benefit from the capacity-building actions identified in Goal 3 of this Plan.

c) Enhance Accessibility for Massachusetts Tribes and Communities with EJ Populations

Communities that lack capacity may not be aware of potentially beneficial resources or may have challenges accessing those resources. MassDEP's NPS Management Section and the EJ NPS Coordinators will conduct and enhance targeted outreach to Massachusetts Tribes and Communities with EJ Populations to raise their awareness of grant funding and other opportunities that reduce equity barriers and facilitate the restoration of local NPS-impaired waters. MassDEP will incorporate new flexibilities mandated by Justice40 into CWA grant programs to allow Massachusetts Tribes and Communities with EJ Populations to participate fully. EJ NPS Coordinators will identify and evaluate barriers to accessibility and develop strategies to remove those barriers. MassDEP will accept federally approved Tribal NPS Management Plans as WBPs, which will enhance Tribal access to CWA s.319 funds to mitigate NPS pollution in tribal watersheds.

d) Increase understanding of tribal traditional ecological knowledge and experience with nature-based solutions.

MassDEP will establish sustained, targeted outreach to Massachusetts Tribes to gain an increased understanding of indigenous knowledge and the value it adds to water resource management in Massachusetts. This initiative will gather information about the intergenerational tribal knowledge and experiences of nature-based solutions, how indigenous knowledge may be incorporated into NPS

management to restore impaired waters, protect healthy waters, and address water quality challenges associated with climate change. The outreach will also aim to identify opportunities to support Tribal NPS management actions through the Massachusetts NPS Management Section.

Indigenous Knowledge

Indigenous Knowledge is a body of observations, oral and written knowledge, innovations, practices, and beliefs developed by Tribes and Indigenous Peoples through direct contact and experience with the environment.

Goal 5. Identify NPS-impaired and healthy waters through water quality monitoring and assessment and develop restoration or protection plans (including TMDLs) for these waters.

Figure 4.31. *Goal 5 and objectives of the Massachusetts NPS Management Plan.*

Table 4.5 Summary: Table 4.5 provides context for Goal 5: Identify NPS-impaired and healthy waters through water quality monitoring and assessment and develop restoration or protection plans (including TMDLs) for these waters. Additional information includes actions, relevant NPS categories, measurable milestones, and the completion timeline of these milestones. This goal is applicable to all major and minor Massachusetts NPS categories. Goal 5 (Table 4.5) includes:

- Four objectives to identify NPS-impaired and healthy waters through a statewide watershed planning approach in Massachusetts.

Table 4.5. *Goal 5*

Table 4.5. Goal 5. Identify NPS-impaired and healthy waters through water quality monitoring and assessment and develop restoration or protection plans (including TMDLs) for these waters.				**Schedule**				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
1. Collaboration with the **Surface Water Quality Standards Section** in MassDEP's Watershed Planning Program – Enhance coordination between the SWQS and NPS Management Sections to restore and protect waters from contaminants associated with NPS pollution	• Annual meeting with the SWQS Section to engage in outreach to communicate new and/or existing criteria in the Massachusetts Surface Water Quality Standards. • Collaborate with the SWQS Section to adopt a coordinated tribal outreach approach.	All	1a. Enhanced coordinated efforts on the development of emerging contaminants criteria. Updates from the annual meeting will be included in the annual report. 1b. Enhanced coordinated efforts on external water quality assessment for emerging contaminants supported by CWA s.604(b) grant funding. Updates from the annual meeting will be included in the annual report. 1c. Enhanced coordinated efforts on tribal outreach. Updates from the biannual meeting will be included in the respective annual report.	1a ☐ 1c ☐	1a ☐	1a ☐	1a ☐ 1b ☐	1a ☐ 1b ☐

Table 4.5. Goal 5. Identify NPS-impaired and healthy waters through water quality monitoring and assessment and develop restoration or protection plans (including TMDLs) for these waters.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
2. Collaboration with the **Water Quality Monitoring Section in MassDEP's Watershed Planning Program** – Enhance coordination between the Water Quality Monitoring and NPS Management Sections to inform the identification of healthy and impaired surface waters	• Coordinate with NRCS, as appropriate, when developing and implementing NWQI monitoring. • Coordinate with the Water Quality Monitoring Section to collect samples for NWQI monitoring. • Coordinate with the Water Quality Monitoring Section to collect samples for coastal monitoring. • Coordinate with the Water Quality Monitoring Section on water quality data collection to expand the availability of data.	All	2a. NWQI Monitoring on at least one NWQI watershed supported by CWA s. 319 funding. 2b. Enhanced coordinated efforts on coastal monitoring. Updates from the annual meeting will be included in the annual report. 2c. Enhanced coordinated efforts on expanding the availability of water quality data. Updates from the annual meeting will be included in the annual report.	2a ☐ 2b ☐ 2c ☐	2a ☐ 2b ☐ 2c ☐	2a ☐ 2b ☐ 2c ☐	2a ☐ 2b ☐ 2c ☐	2a ☐ 2b ☐ 2c ☐
3. Collaboration with the **Data Management and Water Quality Assessment** Section in MassDEP's Watershed Planning Program - Enhance coordination between the Data	• Coordinate with the Data Management and Water Quality Assessment Section to determine the distribution of NPS impairments from all major and minor Massachusetts NPS primary and sub-categories (based on ATTAINS), and to identify healthy waters, after the	All	3a. Analysis of NPS impairment data showing the distribution from Massachusetts NPS primary and subcategories (based on ATTAINS) (Data analysis will be conducted after the biennial publication of the	3a ☐ 3b ☐	3b ☐	3a ☐ 3b ☐	3b ☐	3a ☐ 3b ☐

Table 4.5. Goal 5. Identify NPS-impaired and healthy waters through water quality monitoring and assessment and develop restoration or protection plans (including TMDLs) for these waters.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
Management and Water Quality Assessment Section and the NPS Management Section to identify both healthy and impaired waters, and to improve the specification of NPS impairments.	publication of biennial Massachusetts Integrated Reports. • Coordinate with the Data Management and Water Quality Assessment Section to expand the use of external data for assessments, including data and information generated through CWA s.604(b) grant funding.		Massachusetts integrated lists be included in the 319 annual reports). 3b. Coordinated targeted outreach to enhance external data received to be incorporated into the next Integrated Report					
4. Collaboration with the **Total Maximum Daily Load** Section in the Watershed Planning Program - Enhance coordination between the TMDL and NPS Management Sections to support the development of 9e-WBPs or a-WBPs for nutrient, pathogen, and chloride TMDL implementation.	• Coordinate with the TMDL Section to support WBPs to restore nutrient impaired lakes. • Coordinate with the TMDL Section to support TMDL implementation for nutrient and pathogen TMDLs. • Coordinate with the Water Quality Monitoring, Data Management and Water Quality Assessment, and TMDL Sections to support chloride reduction efforts.	All	4a. Enhanced coordinated efforts on watershed-based plan development for nutrient impaired lakes . Updates from the annual meeting will be included in the annual report. 4b. Enhanced coordinated efforts to support stormwater implementation efforts and community based social marketing (CSBM) efforts . Updates from the annual	4a ☐ 4b ☐ 4c ☐ 4d ☐	4a ☐ 4b ☐ 4c ☐ 4d ☐	4a ☐ 4b ☐ 4c ☐ 4d ☐	4a ☐ 4b ☐ 4c ☐ 4d ☐	4a ☐ 4b ☐ 4c ☐ 4d ☐

Table 4.5. Goal 5. Identify NPS-impaired and healthy waters through water quality monitoring and assessment and develop restoration or protection plans (including TMDLs) for these waters.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Category**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
			meeting will be included in the annual report. 4c. As staffing and funds allow, support stormwater implementation projects and community based social marketing (CBSM) efforts to implement pathogen TMDLs. 4d. Enhanced coordinated efforts on chloride monitoring, TMDL development, and WBP development. Updates from the semi-annual meeting will be included in the annual report.					

a) Collaboration Within MassDEP's Watershed Planning Program

Surface Water Quality Standards Section

The Surface Water Quality Standards (SWQS) Section designates beneficial uses and associated classifications for surface waters (e.g., rivers, lakes, and estuaries) of the Commonwealth, develops statewide water quality criteria and related policies, and revises the Massachusetts SWQS (314 CMR 4.00) based on the latest available science to restore and protect surface waters. If healthy, these systems provide a variety of beneficial uses and services that support aquatic life, sustain natural habitat, promote public health, and facilitate recreational and commercial opportunities. The Massachusetts SWQS regulation is the foundation for MassDEP's water resource management activities under the CWA, including water quality monitoring and assessment, the development of restoration plans for impaired waterbodies, such as TMDLs and the Massachusetts NPS Management Plan, and derivation of water quality-based effluent limits. Revisions to the Massachusetts SWQS include stakeholder engagement such as inter- and intra-agency coordination, public hearings and reviews, and submittal to the USEPA for approval.

Surface Water Quality Monitoring Section

The Surface Water Quality Monitoring Section conducts statewide environmental monitoring activities that support water management in the Commonwealth, including the assessment of surface waters, review and development of water quality criteria in the Massachusetts SWQS, and development of TMDLs and other water management plans, such as the Massachusetts NPS Management Plan. Three major themes inherent to the Surface Water Quality Monitoring Section are as follows: (1) the focus on the watershed as the fundamental planning unit for water quality management; (2) the formation and reliance on partnerships and collaboration to meet water quality goals, as set forth in the Massachusetts SWQS, TMDL implementation plans, and the Massachusetts NPS Management Plan; and (3) the application of new technology and streamlined systems for data processing and analysis to support water quality monitoring and assessment activities. A ten-year strategy for monitoring and assessing surface waters of the Commonwealth, as well as annual reports, are also submitted to the USEPA for approval.

Data Management and Water Quality Assessment Section

The Data Management and Water Quality Assessment Section facilitates and manages key data systems to ensure quality assured internal and external data are available to agency staff, stakeholders and the public; develops the Massachusetts Consolidated Assessment and Listing Methodology (CALM)

Guidance Manual for the assessment of surface waters under CWA s.305(b) and s.303(d); and analyzes chemical, physical, and biological data to conduct assessments and prepare biennial lists of impaired waters that are not supporting designated uses established in the Massachusetts SWQS. Assessment of water quality conditions in the Commonwealth are based on both probabilistic (statewide) and targeted (site-specific) monitoring and assessment approaches. The water quality assessments and listings are reported to the public for comment and to USEPA for approval in the form of a Massachusetts Integrated List of Waters (Integrated Report) every two years.

Total Maximum Daily Load Section

The TMDL Section analyzes surface water data, develops land use and water quality models, and performs technical analyses to determine the maximum pollutant level (i.e., load) that a waterbody can receive and still meet water quality criteria established in the Massachusetts SWQS. Under CWA s.303(d), the Massachusetts Integrated List of Waters (Integrated Report) identifies impaired surface waters and the cause(s) for impairment. All impaired waters listed in Category 5 require the development of a TMDL. The TMDL Section essentially develops a "pollution budget" designed to restore the health of impaired waterbodies. The process of developing this pollution budget, generally referred to as a TMDL, includes identifying the source(s) of the pollutant from direct discharges (point sources) and indirect discharges (nonpoint sources), and developing a plan to meet that goal. TMDL development also includes inter- and intra-agency coordination, public meetings and reviews, as well as submittal to the USEPA for approval.

b) Annual collaboration to identify NPS impairment

NPS Management Section will meet annually or more frequently as necessary with four other Sections of WPP to achieve the milestones mentioned in the four respective objectives of Goal 5. These collaborations aim to continually identify NPS impairments with traditional and newly added NPS pollutants through a statewide watershed planning approach.

Goal 6. Identify and leverage work by federal, state, local and private partners.

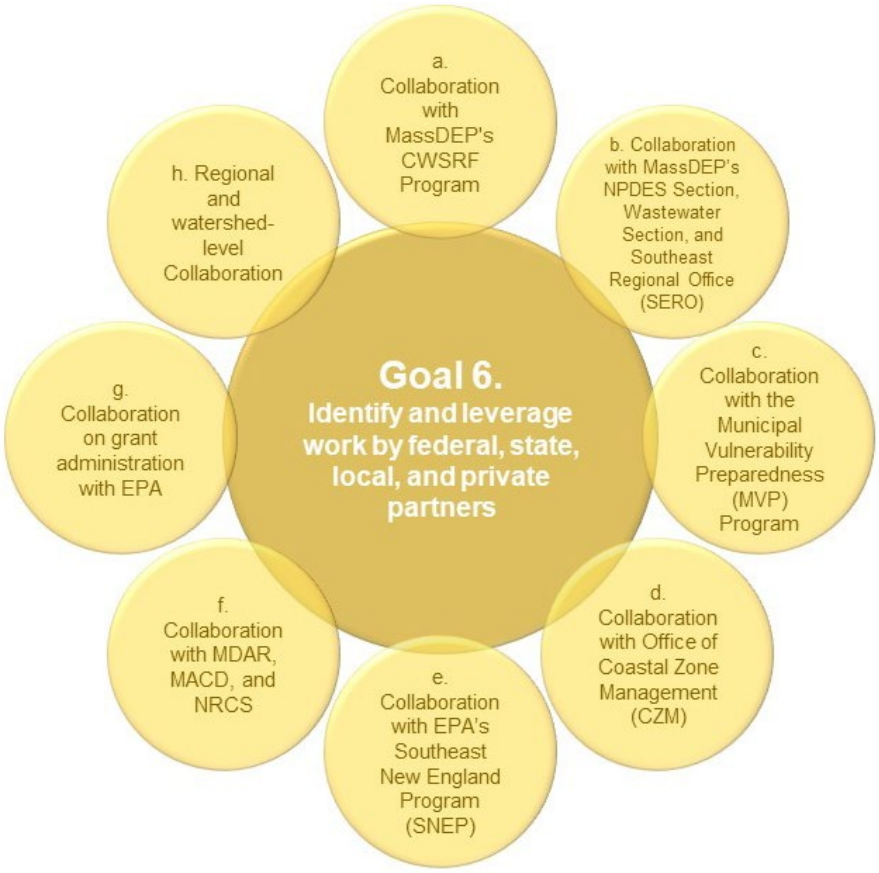


Figure 4.32. *Goal 6 and objectives of the Massachusetts NPS Management Plan (2025-2029).*

Table 4.6 Summary: Table 4.6 provides context for Goal 6 (Identify and leverage work by federal, state, local, and private partners). Additional information includes actions, relevant NPS categories, measurable milestones, and the completion timeline of these milestones. This goal is applicable to source water. All other existing collaboration is documented in Appendix A. Goal 6 (Table 4.6) includes:

- Collaboration for Developed Land (MassDEP's CWSRF, NPDES; MVP; SNEP)
- Collaboration for Septic Systems in Nitrogen Impacted Coastal Waters (MassDEP's CWSRF, Wastewater; SERO; CZM; SNEP)
- Collaboration for Agriculture (NRCS, MDAR, MACD)
- Collaboration with USEPA for program administration of CWA s.604(b) and CWA s.319 grant programs.

Table 4.6. *Goal 6*

Table 4.6. Goal 6. Identify and leverage work by federal, state, local, and private partners.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Categories**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
1. **Collaboration with MassDEP's CWSRF Program:** Collaborate with the CWSRF Program to support the implementation of NPS mitigation from the three focus categories as effectively and expeditiously as possible.	• Consult with MassDEP's CWSRF Program to establish a coordinated NPS approach to stormwater remediation and mitigation. • Consult with MassDEP's CWSRF Program to establish a coordinated NPS approach to the restoration of Nitrogen Impacted Coastal Waters. • Invite the CWSRF Program to participate in or help organize NPS Symposia on NPS mitigation from developed land. • Invite the CWSRF Program to collaboratively organize or participate in NPS Symposia on NPS mitigation from Nitrogen Impacted Coastal Waters.	Developed land Septic systems	1a. Meet annually with the CWSRF Program to establish and sustain a coordinated agricultural NPS mitigation approach through the NPS Roundtable 1b. The CWSRF Program's participation in the NPS Symposia dedicated to NPS mitigation from developed land 1c. The CWSRF Program's participation in the NPS Symposia dedicated to NPS mitigation in Nitrogen Impacted Coastal Waters	1a ☐ 1b ☐	1a ☐ 1c ☐	1a ☐	1a ☐ 1b ☐ 1c ☐	1a ☐ 1b ☐ 1c ☐
2. **Collaboration with MassDEP's NPDES Section, Wastewater Section, and Southeast Regional Office (SERO):** Collaborate with MassDEP's NPDES and Wastewater Sections and	• Work with MassDEP's NPDES Section to establish a coordinated stormwater approach for urban Communities with EJ Populations. • Collaborate with MassDEP's Wastewater Section and SERO to establish a coordinated nitrogen removal approach from the Nitrogen Impacted Coastal Waters.	Developed land Septic systems	2a. One CWA s.604(b) funded project with integrated planning for stormwater mitigation from both PS and NPS in an urban community with EJ Populations. 2b. The NPDES Section's participation in the NPS Symposia is	2b ☐ 2d ☐	2c ☐		2b ☐ 2c ☐	2a ☐ 2b ☐ 2c ☐

Table 4.6. Goal 6. Identify and leverage work by federal, state, local, and private partners.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Categories**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
SERO to establish a coordinated approach to implementing stormwater BMPs for developed land and nitrogen-reducing BMPs for Nitrogen Impacted Coastal Waters.	• Invite the NPDES Section to participate in NPS Symposia on NPS mitigation from developed land and Nitrogen Impacted Coastal Waters to promote a coordinated approach. • Update the Massachusetts Stormwater Handbook.		dedicated to NPS mitigation on developed land. 2c. Participation of MassDEP's NPDES, Wastewater Sections, and SERO in the NPS Symposia dedicated to NPS mitigation in Nitrogen Impacted Coastal Waters. 2d. Updated Massachusetts Stormwater Handbook.					
3. **Collaboration with** Municipality Vulnerability Program (**MVP):** Collaborate with the Municipality Vulnerability Program to support the implementation of NPS mitigation from the three focus categories as effectively and expeditiously as possible.	• Continue to encourage the use of CWA s.319 funds on projects designed or assessed using MVP planning funds and the use of s.604(b) funds for assessment/planning work that could lead to design/implementation with MVP Action funds. • Continue to serve on the MVP grant review committee as staffing allows. • Expand the invitation to MVP staff for the CWA s.604(b) and s.319 grant review process.	Developed Land	3a. Meet annually with MVP to sustain a coordinated NPS mitigation approach from developed land through the NPS Roundtable. 3b. MVP Team's participation in the NPS Symposia dedicated to NPS mitigation from developed land.	3a ☐ 3b ☐	3a ☐	3a ☐	3a ☐ 3b ☐	3a ☐ 3b ☐

Table 4.6. Goal 6. Identify and leverage work by federal, state, local, and private partners.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Categories**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
	• Invite MVP to participate in NPS Symposia on NPS mitigation from developed land.							
4. **Collaboration with EOEEA's Office of Coastal Zone Management (CZM):** Collaborate with the CZM to support the implementation of the NPS mitigation from Nitrogen Impacted Coastal Waters as effectively and expeditiously as possible.	• Continue to encourage the use of CWA s.319 funds on projects designed or assessed using CPR funds and the use of 604(b) funds for assessment work that could lead to design/implementation with CPR funds. • Continue to support healthy watersheds and alignment with CZM coastal priorities, such as an increased emphasis on long-term salt marsh health. • Continue to serve on the CPR grant review committee as staffing allows. • Continue to invite CZM staff to the CWA s.604(b) and s.319 grant review process. • CZM will (1) continue to support the improvement and protection of coastal habitat and water quality through technical assistance and the CPR grant program and work with MassDEP and other partners to identify high-priority areas to target, and (2) establish programs to educate stakeholders on the	Septic systems	4a. Meet annually with CZM to sustain a coordinated coastal NPS mitigation approach through the NPS Roundtable. 4b. CZM participation in the NPS Symposia dedicated to NPS mitigation from Nitrogen Impacted Coastal Waters.	4a ☐	4a ☐ 4b ☐	4a ☐	4a ☐ 4b ☐	4a ☐ 4b ☐

Table 4.6. Goal 6. Identify and leverage work by federal, state, local, and private partners.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Categories**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
	importance of protection of these resources, target resources to protect these areas from future environmental impacts, and help align partner program resources to enhance efforts to protect water quality in these watersheds. •							
5. **Collaboration with USEPA's Southeast New England Program:** Collaborate with SNEP to support the restoration of Nitrogen Impacted Coastal Waters as effectively and expeditiously as possible.	• Continue to serve on the SNEP Steering Committee and SNEP grants review committees as staffing allows. • Continue to invite USEPA's SNEP program staff to the CWA s.604(b) and s.319 grant review process. • Continue to participate in the funding sessions/events organized by the SNEP Network • Establish a partnership with the SNEP Network in Massachusetts. • Invite SNEP to participate in the NPS Symposia on NPS mitigation from septic systems in Nitrogen Impacted Coastal Waters.	Septic systems	5a. Participation in the SNEP Steering Committee and grant review processes. 5b. Participation in the SNEP Symposia. 5c. SNEP participation in the NPS Symposia dedicated to NPS mitigation from Nitrogen Impacted Coastal Waters.	5a ☐ 5b ☐	5a ☐ 5b ☐ 5c ☐	5a ☐ 5b ☐	5a ☐ 5b ☐ 5c ☐	5a ☐ 5b ☐ 5c ☐
6. **Collaboration with MDAR, MACD, and NRCS:** Collaborate with the Massachusetts	• Continue coordination among NRCS, MDAR, MACD, and MassDEP to support agricultural projects and continue the progress achieved through the NWQI.	Agriculture	6a. Meet annually with NRCS, MACD, and MDAR to sustain a coordinated agricultural NPS	6a ☐	6a ☐	6a ☐ 6b ☐	6a ☐ 6b ☐	6a ☐ 6b ☐

Table 4.6. Goal 6. Identify and leverage work by federal, state, local, and private partners.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Categories**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
Department of Agricultural Resources to support the mitigation of NPS impairments caused by agriculture as effectively and expeditiously as possible.	• Expand membership of the CWA s.319 grant review committee to include MDAR staff. • Collaborate with MDAR in establishing geographic focus areas for addressing agricultural NPS and targeting s.319 funds.		mitigation approach through the NPS Roundtable. 6b. Participation of the NRCS, MDAR, and MACD Teams in the NPS Symposia dedicated to NPS mitigation from agriculture.					
7. **Coordinated Program Administration with United States Environmental Protection Agency (USEPA):** Collaborate with USEPA in administering the CWA s.604(b) and s.319 grant programs.	• Continue collaboration with NPS Management Programs in USEPA Region 1 and USEPA Headquarters to administer the CWA s.604(b) and s.319 grant programs.	All	7a. CWA s.604(b) grant Workplans 7b. CWA s.604(b) grant Annual Reports 7c. CWA s.319(b) grant Biennial Workplans with alternate year amendment 7d. CWA s.319(b) grant Annual Reports 7e. Two Success Stories including at least one type 1 story 7f. Participation in NPS Regional Conferences.	7a ☐ 7b ☐ 7c ☐ 7d ☐ 7f ☐ 7g ☐ 7h ☐ 7i ☐ 7j ☐	7a ☐ 7b ☐ 7c ☐ 7d ☐ 7f ☐ 7g ☐ 7h ☐ 7i ☐	7a ☐ 7b ☐ 7c ☐ 7d ☐ 7f ☐ 7g ☐ 7h ☐ 7i ☐	7a ☐ 7b ☐ 7c ☐ 7d ☐ 7f ☐ 7g ☐ 7h ☐ 7i ☐	7a ☐ 7b ☐ 7c ☐ 7d ☐ 7e ☐ 7f ☐ 7g ☐ 7h ☐ 7i ☐

Table 4.6. Goal 6. Identify and leverage work by federal, state, local, and private partners.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Categories**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
			7g. Participation in NPS National Conferences 7h. Participation in the NEIWPCC Workgroup Meetings 7i. Participation in USEPA workgroups 7j. Updated 2025-2029 NPS Management Plan after targeted public outreach 7k. By September 30, 2029, have an updated and EPA-approved NPS Management Program in place including annual milestones for 2030-2034.				7k ☐	
8. **Regional and watershed-level Collaboration:**	• Continue and enhance targeted outreach with Regional Planning Agencies and promote the Regional and/or EJ NPS Coordinators Program to encourage NPS capacity building in all regions.	All	8a. Meet annually with all 13 Regional Planning Agencies 8b. Attend watershed coalition meetings and community events	8a ☐ 8b ☐	8a ☐ 8b ☐	8a ☐ 8b ☐	8a ☐ 8b ☐	8a ☐ 8b ☐

Table 4.6. Goal 6. Identify and leverage work by federal, state, local, and private partners.				Schedule				
Five-Year Objectives	**Actions**	**Primary NPS Categories**	**Measurable Milestones**	**2025**	**2026**	**2027**	**2028**	**2029**
	• Attend watershed coalition meetings and community events as staffing allows							

a. NPS Roundtable

The NPS Management Section will convene an NPS Roundtable with key NPS partners to collaboratively organize an approach to manage NPS pollution caused by three focus categories. Intra-agency partners will include MassDEP's CWSRF Program, the Wastewater Section, the Surface Water Discharge Permitting (NPDES) Section of the Division of Watershed Management, and MassDEP's Southeast Regional Office (SERO). Inter-agency partners will include the Municipal Vulnerability Preparedness (MVP) Program, the Office of Coastal Zone Management (CZM), USDA NRCS, the Massachusetts Department of Agricultural Resources (MDAR), the Massachusetts Association of Conservation Districts (MACD), and USEPA. Other federal, state, regional, and local partners will be invited as appropriate. The NPS Roundtable will meet annually to identify and implement a coordinated NPS mitigation approach and to establish watershed priorities to restore impaired waters and protect healthy waters in the Commonwealth.

b. NPS Symposia

The NPS Management Section will work collaboratively with NPS partners to plan and conduct annual outreach symposia for Massachusetts watershed practitioners, including regional planning agencies, municipalities, watershed organizations, conservation districts, educational institutions, and consultants. Each symposium will focus on a discrete primary pollutant category, such as developed land in 2025, Nitrogen Impacted Coastal Waters [septic systems] in 2026, and agriculture in 2027. NPS Symposia in 2028 and 2029 will be combined for all three focus categories. The primary objective of the annual NPS symposium will be to share information, tools, and resources to assist potential NPS grant applicants in developing strong project proposals, provide a platform to showcase successfully completed projects, stimulate ideas for future projects, and learn from one another.

c. Collaboration for Developed Land

The NPS Management Section will collaborate with MassDEP's CWSRF Program, NPDES Section, MVP Program, and USEPA's Southeast New England Program (SNEP) to support the implementation of NPS mitigation for pollutants derived from developed land as effectively and expeditiously as possible.

Massachusetts Clean Water State Revolving Fund Program (CWSRF)

Program Description

The CWSRF provides low-interest subsidized loans to assist municipalities in complying with federal and state water quality requirements. Initial federal funding for the CWSRF is provided through USEPA. The CWSRF is authorized to provide financial assistance for the construction of publicly owned treatment works (CWA s.212), projects that implement NPS management programs (CWA s.319), and the development and implementation of an estuary conservation and management plan (CWA s.320). Massachusetts also has a separate Drinking Water State Revolving Fund (DWSRF), which is a joint federal-state financing program providing subsidized interest loans to protect public health by improving water supply and infrastructure systems and protecting drinking water.

The CWSRF is jointly administered by the MassDEP Division of Municipal Services and the Massachusetts Clean Water Trust. Each year, MassDEP solicits projects from municipalities and wastewater districts to be considered for subsidized loans. The current subsidy is provided via a 2% interest loan. In recent years, the program has operated with $225 to $350 million per year and has financed 50 to 70 projects annually. A CWSRF goal is to provide incentives to communities for projects that have meaningful water quality and public health benefits and address the needs of communities and watersheds.

Financial assistance is available for planning and project construction, including CSO mitigation, new and upgraded wastewater treatment facilities, infiltration/inflow correction, wastewater collection systems, and NPS pollution abatement projects, including green infrastructure projects. These projects can include landfill capping, community programs for upgrading septic systems, brownfield remediation, pollution prevention, and stormwater remediation. Non-structural projects are also eligible for CWSRF funding (e.g., planning projects for NPS pollution that are consistent with the Massachusetts NPS Management Plan, the identification of pollution sources, and the evaluation of potential remediation strategies).

MassDEP ranks projects using the Commonwealth's priority ranking system, which is reviewed annually to reflect changing priorities. The current criteria emphasize the following:

- The nature of the public health problem that the project will address;
- The criticality of the resources affected;
- The environmental benefits of the project;
- The effectiveness of the project solution;
- The extent to which the project is consistent with region- or watershed-wide plans; and
- The extent to which projects qualify as green projects.

NPS Management Section and CWSRF Collaboration: Section 3 of the Massachusetts NPS Management Plan details the categories of NPS pollution that are the focus of funding priorities for both the NPS Management Section and the CWSRF Program. Projects that address these priorities are eligible for funding under either program (Figure 4.33). The state portion of CWSRF project funding may be counted as match for CWA s.319 grants.

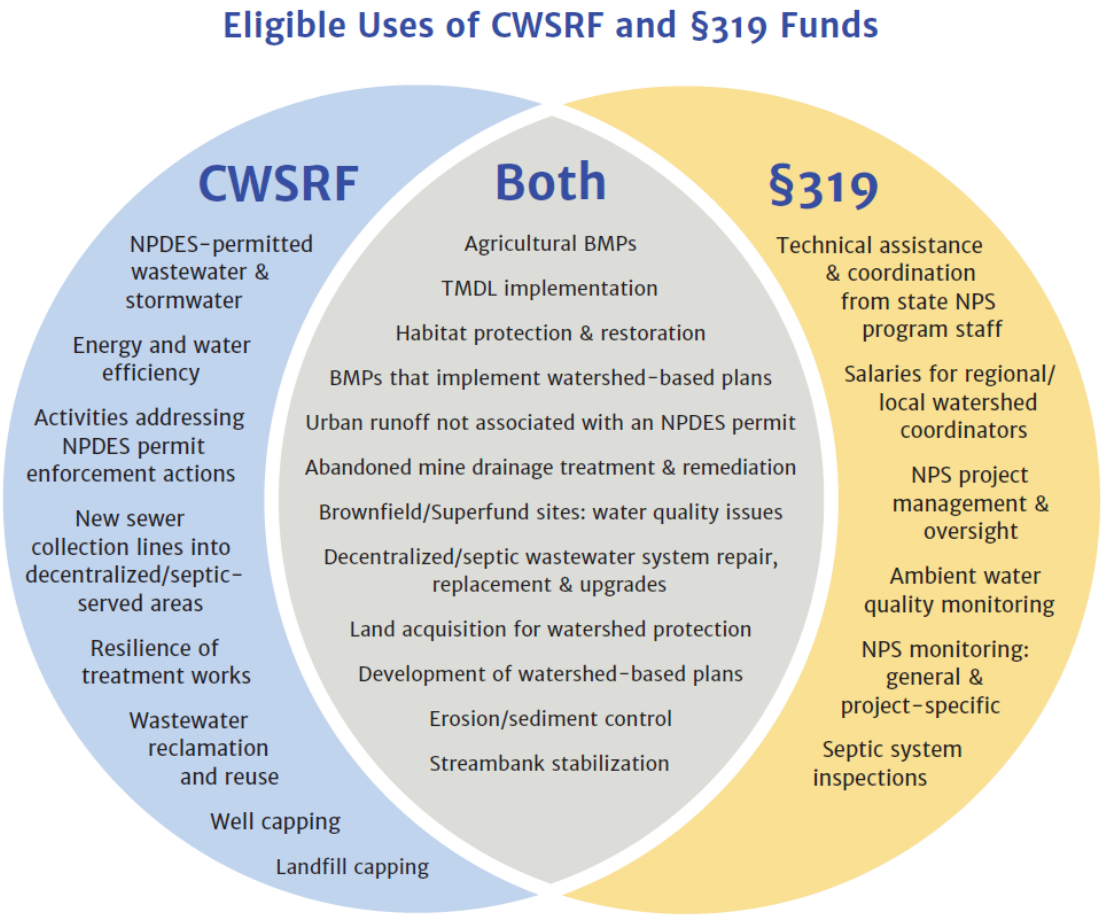


Figure 4.33. *Eligible uses of CWSRF and CWA s.319 funds (USEPA, 2021).*

Throughout the history of its CWSRF, Massachusetts has leveraged the federal SRF grant to expand the available loan capacity and underwrite many more projects than would have been possible had the Commonwealth used the direct loan approach taken by most states. One consequence of the leveraged approach is that Massachusetts has been able to finance a number and variety of NPS planning and management projects over the years, even though NPS projects, due to scope and scale, are generally not as competitive as traditional wastewater projects. These traditional wastewater projects, or CWA s.212 projects, naturally tend to have more impact on public health and environmental resources, and thus score more highly in the rankings. Nonetheless, NPS projects are proposed and financed by Massachusetts communities. Project types that the Commonwealth has financed and will continue to finance include Stormwater Management Plans, landfill capping and closure, onsite wastewater systems, package treatment plants, and water and energy efficiency projects. Specific to septic issues, CWSRF loans are available at 0% interest in nutrient-impaired areas, to incentivize projects that mitigate nitrogen NPS pollution from septic systems.

In 2022, the NPS Management Section assisted the Massachusetts CWSRF Program with the Clean Watersheds Needs Survey (CWNS). The CWNS provides an estimate of a state's needs for funding to complete CWSRF-eligible projects such as publicly owned treatment works (POTW) and treatment facilities, stormwater, CSO correction, NPS control projects, and decentralized wastewater management. The CWNS also influences funding allocations under the Sewer Overflow and Stormwater Reuse Municipal Grants Program (OSG). The NPS Management Section developed two state-specific approaches for identifying needed projects and estimated costs for two NPS control categories: VII-B Agriculture (Animals) and VII-K Hydromodification.

In 2023, the NPS Management Section partnered with CWSRF to identify state funds to comply with the required 40% non-federal match for the FFY2023-2024 CWA s.319 grant funding cycle.

MassDEP National Pollutant Discharge Elimination System (NPDES) Section

Program Description

In Massachusetts, the NPDES permit program is administered solely by the USEPA. However, MassDEP administers a parallel surface water discharge permitting program. Both programs control water pollution by regulating point sources that discharge pollutants to surface waters. For the most part, general permits are administered by USEPA, require submission of a Notice of Intent (NOI) to USEPA, and do not require an application to MassDEP. However, there are some circumstances that require submittal to both

MassDEP and USEPA. The following situations require applicants to submit a MassDEP transmittal form, a copy of the USEPA's NOI, payment (unless exempt), and any other required submittals to MassDEP:

- Construction General Permit (CGP) with discharge to Outstanding Resource Waters (ORW);
- Massachusetts Small Municipal Separate Storm Sewer Systems (MS4) Permit;
- Publicly Owned Treatment Works General Permit (POTW GP);
- Potable Water Treatment Facilities General Permit (PWTF GP) for first time applicants that also discharge to an ORW and High Quality Waters;
- Remediation General Permit (RGP) discharges from non-MCP sites;
- Hydroelectric Generating Facilities General Permit (Hydro GP) with discharge to ORW waters.

NPS Management Section and NPDES Section Collaboration

In Massachusetts, stormwater runoff discharged from storm drain systems from developed land is regulated through the Massachusetts Small MS4 Permit. The NPS Management Section partners with the MassDEP MS4 permit program to support the implementation of stormwater BMPs in MS4s that are not specifically required by the MS4 permit. From the *Nonpoint Source Program and Grants Guidelines for States and Territories* (USEPA, 2024), "Section 319 funds may be used to fund any urban stormwater runoff activities that are not specifically required by an NPDES permit. The USEPA recognizes the benefits of integrating Section 319 funds and urban stormwater runoff activities to achieve the CWA goals as much as is legally allowable. Stormwater BMPs may be required under the terms of an NPDES permit. In general, in cases where management activities such as pollution prevention, green infrastructure (GI), or low-impact development are funded using Section 319 funds, those funded activities should advance water quality protection or restoration above and beyond the requirements or measures required by the NPDES permit (i.e., implement projects, performance measures, and outreach and education efforts not required by an NPDES permit). Examples of GI that may be appropriate for Section 319 funding include green roofs, bioretention practices, urban tree canopy, landscaped swales, and wetland/riparian area protection and restoration. In addition to implementing GI, the following urban runoff management activities may generally be considered eligible for Section 319 funding as long as they are not required by an NPDES permit (this list is not meant to be comprehensive):

- Providing technical assistance to state and local stormwater programs.
- Conducting the monitoring needed to design and evaluate the effectiveness of implementation strategies.

- Designing, implementing, or installing structural and nonstructural BMPs for pollution prevention and urban runoff control (except for BMPs that are required by NPDES permits).
- Developing and conducting education programs outside of NPDES permit requirements, i.e., outreach and educational efforts and activities conducted on the watershed, region, or state level that are not required by an NPDES permit but address NPS pollution in an area that includes an MS4 subject to an NPDES permit.
- Offering technology transfer and training.
- Developing and implementing regulations, policies, and local ordinances to address stormwater runoff (These may apply to areas covered by NPDES permits, provided that the regulations, policies, and ordinances also apply to nonpermitted areas).
- Implementing stormwater projects outside of the geographic area of the MS4 subject to the NPDES permit; developing WBPs that go beyond permit requirements or include areas not regulated by the permit."

MS4 and NPS Management Section staff meet regularly to discuss stormwater management priorities and activities. The NPS Management Section will work with MassDEP's NPDES Section to establish a coordinated stormwater approach for urban Communities with EJ Populations. Surface Water Discharge Permitting Section staff participate on the review/selection committees for CWA s.604(b) and s.319 grants. NPS Management Staff participate on the review/selection committees for the MS4 grant.

Municipal Vulnerability Preparedness (MVP) Program (EEA)

Program Description

Launched in 2017, this partnership program between state government and cities and towns helps municipalities plan for and implement priority climate change adaptation projects that build resiliency and reduce risk. The program is split into two components, a planning grant and an action grant. The planning grant provides funding to municipalities to assess their vulnerability and prepare for climate change impacts and build community resilience. Currently 99% of Massachusetts towns and cities have participated in this process. In 2023, MVP launched MVP 2.0, which builds on work communities have done to date, and supports communities with new processes, tools, and resources for building resilience. The MVP Action Grant is available for communities that have completed

the planning grant process and are ready to implement adaptation strategies identified during the planning process.

NPS Management Section and MVP Collaboration

MVP municipalities have used CWA s.604(b) grant funds to conduct assessments and advance preliminary BMP designs. Similarly, projects identified through the MVP planning process have been constructed and implemented using CWA s.319 funds. Additionally, MVP grants have been used as non-federal match for CWA s.604(b) and s.319 projects, and vice versa. The NPS Management Section will expand MVP and MassDEP efforts to educate the public on climate change and the connection to NPS pollution via participation in the NPS Symposia on NPS mitigation from developed land. The NPS Management Section will continue to encourage the use of CWA s.319 funds on projects designed or assessed using MVP planning funds and the use of CWA s.604(b) funds for assessment/planning work that could lead to design/implementation with MVP Action funds. The NPS management Section will continue to serve on the MVP grant review committee as staffing allows and expand the invitation to MVP staff to particpate in the CWA s.604(b) and s.319 grant review process.

Southeast New England Program (SNEP)

Program Description

SNEP is a USEPA-led interagency group formed to coordinate the functions and programs of the many federal, state, and local agencies, and partners in research institutions and nongovernmental organizations that implement programs to restore, preserve, and monitor the coastal watersheds of Southeast New England. In 2014, USEPA initiated SNEP to build a resilient ecosystem of clean water, healthy diverse habitats, and sustainable communities in southeast New England's coastal watersheds. The program region includes the south-facing coastal watersheds from Westerly, Rhode Island, to Chatham, Massachusetts; the watersheds of the Narragansett and Buzzards Bay NEPs; and islands of Martha's Vineyard, Nantucket, Elizabeth Islands, and Block Island. In 2017, USEPA Region 1 began partnering with Restore America's Estuaries, a nonprofit organization, to manage a local watershed project grant program. From 2014 through 2023, the program issued $39 million in funding to support local research, demonstrate new technologies, and implement restoration activities. In 2019, the grant priorities include projects that address nutrient reduction and impacts, coastal resiliency,

new innovative technologies, environmental plan implementation, and assessment of environmental programs, among others.

NPS Management Section and SNEP Collaboration

MassDEP and SNEP work collaboratively to implement programs to restore the waters of southeast Massachusetts. MassDEP will establish a partnership with the SNEP Network in Massachusetts. The NPS Management Section staff will continue to serve on the SNEP Steering Committee and SNEP grants review committees and participate in funding sessions/events organized by the SNEP Network. NPS Management Section staff will participate on the review/selection committees SNEP grants and continue to invite USEPA's SNEP program staff to participate in the CWA s.604(b) and s.319 grant review process.

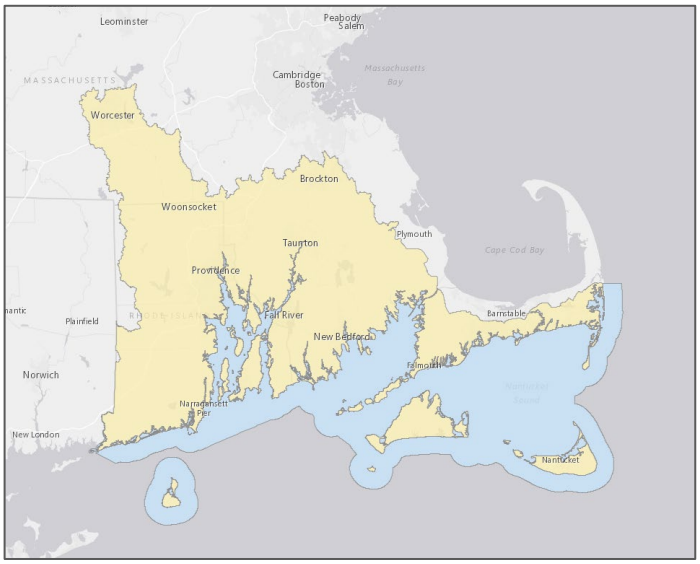


Figure 4.34. *The Southeast New England program boundary. Graphic source: USEPA.*

d. Collaboration for Nitrogen Impacted Coastal Waters (Septic Systems)

The NPS Management Section will collaborate with MassDEP's CWSRF, MassDEP's Wastewater Section and Southeast Regional Office (SERO), CZM, and SNEP to support the implementation of NPS mitigation for pollutants in Nitrogen Impacted Coastal Waters as effectively and expeditiously as possible. NPS Management Section collaboration with the CWSRF Program and SNEP were previously described above.

MassDEP Wastewater Section

Program Description

MassDEP's Wastewater programs protect public health and the environment through the regulation of discharges from treatment plants, industrial facilities, sewers, and other sources. These programs also ensure the safety of septic systems and alternative septic treatment technologies. The state Title 5 Regulations (310 CMR 15.00) ensure proper and effective disposal of NPS discharges from onsite wastewater systems.

NPS Management Section and MassDEP Wastewater Section Collaboration

The NPS Management Section will collaborate with MassDEP's Wastewater Section to establish a coordinated nitrogen removal approach from the Nitrogen Impacted Coastal Waters. NPS Management Section and the Wastewater Management Program also coordinate joint participation in activities related to the Massachusetts Alternative Septic System Technology Center (MASSTC) to develop and test wastewater treatment technologies.

MassDEP Southeast Regional Office (SERO) Wastewater Management Section

Program Description

MassDEP's Southeast Regional Office serves 84 towns and cities from the southern suburbs of Boston to the Rhode Island border along with Cape Cod, Martha's Vineyard, Nantucket and the Elizabeth chain. The Wastewater Management Section protects public health and the environment through the regulation of discharges from treatment plants, industrial facilities, sewers, and other sources. This program also ensures the safety of septic systems and alternative septic treatment technologies.

NPS Management Section and SERO Collaboration

The NPS Management Section will collaborate with SERO to establish a coordinated nitrogen removal approach from Nitrogen Impacted Coastal Waters.

Massachusetts Office of Coastal Zone Management (CZM)

a. Massachusetts Coastal Nonpoint Pollution Control Program (CNPCP)

Program Description

Under Section 6217 of the federal 1990 Coastal Zone Act Reauthorization Amendments (CZARA), states and territories with approved Coastal Zone Management Programs are required to develop the CNPCP. In its program, a state or territory describes how it will implement NPS pollution controls, known as management measures, that conform to those described in *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. This program is administered jointly by the National Oceanic and Atmospheric Administration (NOAA) and USEPA. The management measures cover the range of potential NPS pollution sources that can be found within the coastal zone and include urban sources (developed areas, septic systems, erosion and construction sites, watershed protection, and roads

and highways), marinas and recreational boating, agriculture, forestry, hydromodification, and wetlands restoration and protection efforts. In Massachusetts, CZM manages the CNPCP, which is implemented in coordination with MassDEP as part of the state NPS Management Plan that is specific to the Massachusetts coastal zone. CZM submitted a draft CNPCP Plan in 1996 and received full program approval from NOAA and USEPA in 1997. A long-term (15-year) strategy and short-term (five-year) goals were developed in 1999 with proposed goals and actions. The CNPCP Plan was revised in 2014 with updates to the long-term strategy and short-term goals.

Current CNPCP goals and action items are incorporated into this NPS Plan as Appendix B.

b. Coastal Pollutant Remediation Grant Program (CPR)

Program Description

The Coastal Pollutant Remediation (CPR) Grant Program was established in 1994 by the Massachusetts Legislature to help communities identify and improve water quality impaired by NPS pollution. The CPR Grant Program funds roughly $500,000 per year in projects throughout the designated Massachusetts coastal watershed. From 1996-2022, CZM awarded close to $13 million in CPR grants. The CPR Program has the following priorities:

- Remediate pollution to waterbodies listed on the state's Integrated List of Waters;
- Improve or protect estuarine and freshwater habitat for diadromous fish within the coastal watershed;
- Protect or improve condition of coastal habitats such as salt marshes and eelgrass beds;
- Improve water quality in waterbodies subject to eutrophication from nutrient inputs in stormwater runoff and boat waste discharges;
- Reduce or eliminate instances of beach closures due to elevated bacteria levels;
- Preserve or expand opportunities for shellfish harvesting;
- Site and design stormwater BMPs to increase treatment effectiveness and long-term resiliency to climate change impacts;
- Expand the use of appropriate green infrastructure and low-impact development techniques where to manage and treat stormwater effectively; and
- Install commercial boat waste pump-out facilities to support compliance with the statewide No Discharge Zone.

The CPR grant program emphasizes projects that benefit coastal ecosystems and recreational and economic activities, especially those that include BMPs to reduce bacteria, nutrients, and other pollutants affecting coastal resources. The CPR funds three categories of coastal zone projects:

- Assessment, identification, and characterization of NPS pollution from impervious (hard) surfaces, which can include determining sources of roadway-related pollution, identifying appropriate stormwater control methods (also known as BMPs), and siting these BMPs;
- Design/construction of BMPs to treat runoff from roads, highways, and municipal parking lots; and
- Design and construction of commercial boat-waste pump-out facilities to reduce pollution related to discharges from vessel holding tanks.

CZM also provides technical assistance for marinas and other entities that might pollute coastal zones, through the release and use of the Clean Marina Guide. CZM Regional Coordinators also provide direct technical assistance to communities that are implementing coastal projects.

c. <u>Massachusetts Bays National Estuary Program (MassBays)</u>

Program Description

MassBays is one of 28 National Estuary Programs established by Congress under the CWA s.320 (reauthorized in 2016). While its official boundaries reach up into the watersheds that drain to Ipswich Bay, Massachusetts Bay, and Cape Cod Bay—and offshore to the Stellwagen Bank National Marine Sanctuary—MassBays focuses its efforts on the near-coast and estuarine reaches of the Bays' coastal streams. MassBays funds a small-grant program called the Healthy Estuaries Grant to support local investigations of habitat and water quality conditions, and proof-of-concept research efforts. The current Comprehensive Conservation and Management Plan (CCMP), titled "A Blueprint for the Bays" was approved by USEPA in February 2023, and will guide MassBays' activities through 2033.

NPS Management Section and MassBays Collaboration

Key collaboration between the NPS Management Section and MassBays include:

- MassDEP has served on MassBays' Management Committee since before its designation as an NEP. Since 2013, MassDEP has provided a representative who attends quarterly meetings and participates in the Science and Technical Advisory Subcommittee.

e. Collaboration for Agriculture

The NPS Management Section will collaborate with NRCS, MDAR, and MACD to support the implementation of NPS mitigation for pollutants derived from agriculture to restore impaired waters.

a. USDA Natural Resources Conservation Service (NRCS)

Program Description

NRCS (http://www.nrcs.usda.gov/wps/portal/nrcs/site/ma) provides farmers and forestland owners with financial and technical assistance to voluntarily put conservation on the ground, helping not only the environment but agricultural and forest operations as well.

Environmental Quality Incentives Program (EQIP): EQIP provides financial assistance to agricultural producers and private forest landowners to implement conservation practices (recommended in an NRCS-approved conservation plan) that address natural resource concerns and that improve soil, water, plant, animal, wildlife habitat, air, and related resources on agricultural land and non-industrial private forestland. EQIP is a competitive program, and applications are funded based on the greatest environmental benefits (ranking) of each application. EQIP is also used to fund Conservation Innovation Grants (CIGs), which support development and adoption of innovative conservation approaches and technologies to provide agricultural producers with more options for environmental enhancement and regulatory compliance.

National Water Quality Initiative (NWQI): The National Water Quality Initiative, established in 2012, is a partnership among NRCS, state water quality agencies, and the U.S. Environmental Protection Agency. Through NWQI, NRCS works with farmers and ranchers to improve water quality in watersheds where on-farm conservation investments and focused water quality monitoring and assessment can deliver the greatest benefits for clean water. From 2021 to 2023, NRCS provided approximately $333 million in financial assistance to help farmers and ranchers implement conservation systems to reduce nitrogen, phosphorus, sediment, and pathogen contributions from agricultural land across the United States (NRCS, 2024). NRCS works closely with partners, including federal and state agencies and Soil and Water Conservation Districts, to select priority watersheds where watershed assessments and outreach will be performed. Updates to the NWQI in the 2018 Farm Bill include a focus on watershed assessment and planning and use of multi-year budgets to demonstrate long-term commitment in assisting water quality

efforts. In Massachusetts, the Palmer River Watershed was selected as a priority watershed in 2014. NRCS coordinated with local and state agencies including MassDEP and MDAR, conservation districts, MACD, non-governmental organizations, and others to implement the Palmer River NWQI. This strategic approach leveraged multiple funding sources and provided streamlined assistance to help individual agricultural producers take needed actions to reduce the runoff of sediment, nutrients, and pathogens into waterways where water quality is a critical concern. MassDEP funded several projects through the s.319 grant for implementation projects in the Palmer River watershed. Outcomes of the very successful Palmer River Watershed Initiative can be viewed online at: https://www.rehobothma.gov/agricultural-commission/pages/palmer-river-watershed-initiative.

Massachusetts currently has four designated NWQI watersheds:

- Unkety Brook and James Brook (Nashua River Watershed - HUC[3] 010700040402)
- Manhan River (Connecticut River Watershed – HUC 010802010608)
- South River (Deerfield River Watershed - HUC 010802030501)
- Westport River (Buzzards Bay Watershed - HUC 010900020502)

In 2024, MassDEP began water quality monitoring in the upper Manhan River in cooperation with NRCS and USEPA. Water quality samples are processed at the USEPA New England Regional Laboratory in North Chelmsford, Massachusetts.

Conservation Stewardship Program (CSP): CSP participants receive annual land use payments for operation-level environmental benefits they produce. Under CSP, participants are paid for conservation performance—the higher the operational performance, the higher their payment. The CSP encourages producers to address resource concerns comprehensively by undertaking additional conservation activities and improving, maintaining, and managing existing conservation activities.

Regional Conservation Partnership Program (RCPP): RCPP promotes coordination between NRCS and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance to producers through partnership agreements and program contracts or easement agreements.

[3] A hydrologic unit code (HUC) is a watershed identification number based on a hierarchical watershed classification system created by the U.S. Geological Survey.

Through RCPP, NRCS and its partners help producers install and maintain conservation activities in selected project areas. Partners leverage RCPP funding in project areas and report on the benefits achieved.

Agricultural Conservation Easement Program (ACEP): ACEP provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the agricultural land easements component, NRCS helps Indian tribes, state and local governments, and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. Under the wetlands reserve easements component, NRCS helps to restore, protect, and enhance enrolled wetlands.

NPS Management Section and USDA Collaboration

NPS Management Section staff participate in the NRCS State Technical Committee meetings that determine distribution of EQIP funds and related Farm Bill program priorities in Massachusetts.

NRCS is collaborating with the NPS Management Section, MDAR, MACD, and the Franklin Regional Council of Governments (FRCOG) in implementation of the NWQI for Unkety Brook, Westport River, Manhan River, and South River. NRCS recently collaborated with MassDEP and MACD on a CWA s.319-funded project in the Westport River watershed. This project sought to duplicate the success of the Palmer River NWQI collaboration, with MassDEP supporting MACD staff to work directly with farmers to encourage and facilitate engagement with NRCS conservation programs such as EQIP-funded projects to meet the goals of NRCS, a CWA s.319 and the Town of Westport Targeted Integrated Water Management Plan. In 2024, MassDEP began water quality monitoring in the upper Manhan River and will continue similar coordination annually. NRCS funding is available to identify additional NWQI watersheds in Massachusetts to provide similar, targeted support to farmers for controlling NPS from agricultural practices. The NPS Management Section, NRCS and USEPA will collaborate to identify priority watersheds.

b. Massachusetts Department of Agricultural Resources (MDAR)

Program Description

MDAR's mission is to ensure the long-term viability of agriculture in Massachusetts. MDAR strives to support, regulate, and enhance the rich diversity of the Commonwealth's agricultural community to

promote economically and environmentally sound food safety and animal health measures, and fulfill agriculture's role in energy conservation and production.

A brief summary of MDAR programs that are applicable to NPS pollution is provided below, followed by a discussion of opportunities for improved collaboration between MDAR and the NPS Management Section.

Agricultural Environmental Enhancement Program (AEEP): The AEEP is MDAR's primary program related to NPS pollution. AEEP supports agricultural operations with installation of conservation practices to improve water quality, air quality, and efficient water use. Farmers are reimbursed for 85% of project costs up to $25,000 to install approved practices. Examples of eligible practices include manure storage, irrigation efficiency, water control structures, pesticide storage facilities, and fencing to keep livestock out of a water resource.

Agricultural Preservation Restriction Improvement Program (AIP): The purpose of the AIP is to help sustain active commercial farming on land that has already been protected through the MDAR Agricultural Preservation Restriction Program. AIP provides technical assistance and business planning to improve farm productivity and profitability. The AIP provides assistance to enhance the long-term use of the agricultural resource, which may include economic viability, environmental sustainability, resource conservation, family succession planning, infrastructure improvement, or other issues. Participants may be eligible to receive funds of $25,000–$100,000 as reimbursement for on-farm projects, including resource management or new or improved buildings.

Farm Viability Enhancement Program (FVEP): FVEP seeks to improve the economic viability and environmental integrity of participating farms through development and implementation of farm viability plans. FVEP offers farmers environmental, technical, and business planning assistance to expand, upgrade, and modernize their operations. The program offers grants of $25,000–$125,000. Capital for the implementation of the improvements recommended in the viability plan is available in exchange for an agricultural covenant on the farm property for a fixed term of five or 10 years.

Agricultural Energy Grant Program (Ag-Energy): This program funds projects to improve energy efficiency, promote farm use of alternative clean energy technologies, and help farmers switch from oil heating to natural gas. It is associated with NPS pollution control through funding of projects resulting in air quality improvements. Up to $25,000 is available in two categories: renewable energy and energy efficiency. Priority is given to proposals that focus on technologies listed in the application. Priority projects

for renewable energy have included geothermal, photovoltaics, wind, and solar thermal. Priority projects for energy efficiency have included precoolers, variable-speed vacuum pumps, thermal blankets, reverse osmosis, and high-efficiency refrigeration.

Agricultural Climate Resiliency & Efficiencies (ACRE) Program: The ACRE program provides funding for projects that address agricultural vulnerability to climate change. The program also looks to fund projects that meet the goals in the Massachusetts Local Action Food Plan. Eligible projects areas include soil health (e.g., no-till equipment), protection of water resources, energy efficiency and renewables, and food safety.

Massachusetts Plant Nutrient Regulations: In 2012, the Massachusetts Legislature passed An Act Relative to the Regulation of Plant Nutrients, which directed MDAR to develop regulations to ensure that plant nutrients are applied effectively to provide sufficient nutrients for maintaining healthy agricultural and non-agricultural land, including turf and lawns, while minimizing the impacts of the nutrients on surface water and groundwater resources to protect human health and the environment. Regulations were promulgated in late 2015 and revised in early 2018. In addition to ensuring the proper use and application of plant nutrients, the regulations also enhance the ability of municipalities to maximize the credits relative to stormwater discharge or similar permits issued by USEPA.

NPS Management Section and MDAR Collaboration

MassDEP coordinates with MDAR as needed when MassDEP identifies a water quality concern related to agricultural activities. MDAR is responsible for following up on issues and coordinating with MassDEP on any necessary action. The NPS Management Section will continue coordination among NRCS, MDAR, MACD, and MassDEP to support agricultural projects and continue the progress achieved through the NWQI.

It would be beneficial to MassDEP and MDAR to establish shared priorities for grants and explore other coordination avenues to integrate programs with similar objectives. MassDEP will collaborate with MDAR in establishing geographic focus areas for addressing agricultural NPS and targeting CWA s.319 funds. The NPS Management Section will expand membership of the CWA s.319 grant review committee to include MDAR staff.

c. Massachusetts Association of Conservation Districts (MACD)

Program Description

MACD is a nonprofit organization that provides representation for the 13 conservation districts in Massachusetts. MACD works with partners including MassDEP, MDAR, and NRCS to provide technical assistance to farmers for implementation of BMPs that protect water quality. MACD also helps farmers locate and apply for funding, largely through EQIP and the s.319 grant program. MACD has played a key role in facilitating conservation practice implementation through collaboration with MassDEP and NRCS for the Palmer River NWQI and is working with NRCS to duplicate that success through the "Ground Based Water Quality Implementation" RCPP Project in Worcester County.

NPS Management Section and MACD Collaboration

MACD's collaboration with the NPS Management Section occurs mostly through CWA s.319-funded projects. MACD helps farmers find available funding sources, including CWA s.319 grants and EQIP. In addition, member conservation districts receive state funding that can be used to meet non-federal match requirements for CWA s.319 projects.

In the Palmer River NWQI project, MACD provided staff to conduct outreach, develop conservation plans, and connect farmers with financial and technical assistance available from various project partners. Opportunities exist for increased collaboration between MassDEP and MACD on similar projects that leverage each agency's role and funding sources to deliver coordinated regional conservation planning for agricultural lands.

MACD is collaborating with MassDEP and NRCS on several projects in Hampden, Hampshire, and Berkshire Counties that, similar to the Palmer River NWQI, leverage each agency's role and funding sources to deliver coordinated regional conservation planning for agricultural lands. MACD is conducting outreach to farmers in the watershed to educate them on water quality and conservation needs and generate interest in the available assistance programs. MACD will then provide planning and technical assistance to connect landowners with funding and other assistance available through NRCS and MassDEP programs. MassDEP will continue coordination with MACD to support agricultural projects and continue the progress achieved through the NWQI and CWA s.319-funded projects.

f. Collaboration with USEPA

Coordinate CWA s.604(b) and s.319 Grant Administration with USEPA and Program Evaluation

USEPA provides CWA s.319 funding to MassDEP, and USEPA Region 1 provides programmatic oversight of state CWA s.319 NPS programs within the Region. A summary of USEPA Watersheds and

NPS Pollution Programs and priority activities that support NPS pollution control is provided below. Additional USEPA programs and activities can be found in Appendix A.

CWA s.319: CWA amendments in 1987 established the CWA s.319 Nonpoint Source Management Program. USEPA also provides CWA s.319 grant program oversight and guidance to states, territories, and tribes. Under CWA s.319, USEPA provides states, territories, and tribes with federal grant money to establish NPS programs that will achieve and maintain beneficial uses of waters. State programs may use federal CWA s.319 funds to support a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, watershed implementation projects, and monitoring to assess the success of specific NPS watershed projects that implement WBPs.

NPS Management Section Evaluation: The periodic, structured evaluation of any plan is a necessary activity, both to assess progress toward the achievement of goals and outcomes and to adjust strategies to account for changes in policy, science, or available information. MassDEP recognizes that successful implementation of the Massachusetts NPS Plan will require evaluation of goals and activities, and following-through with appropriate steps to respond to new information. This section identifies the actions MassDEP will take to evaluate the NPS Plan, and how gathered information will advise future updates of the Plan.

Program Review: MassDEP will use the "Goals" tables from Section 4 of this Plan (Tables 4.1 - 4.6) as the foundation for its evaluation framework. Each year, the milestones for each objective under each goal will be reviewed and compared to implemented activities that supported their completion. If progress toward a given milestone does not occur, information will be collected and reported to explain the reason for lack of progress. If obstacles or issues are identified, possible solutions or remedies will be developed and reported. It may be necessary to reprioritize or revise some milestones for future revisions to the Plan; the rationale for these decisions will also be noted. All information will be used as a part of a comprehensive reevaluation of the NPS Plan and will be used to develop an outline of needed revisions to the Plan as a part of the update process, The adaptive management approach will be followed, as appropriate, for this formal program evaluation.

MassDEP will also continue to look for opportunities to improve current processes through its work with stakeholders; project partners; and its federal, state, and local NPS partners. This will include, at a minimum, gathering feedback from stakeholder forums, partner meetings, and customer interactions. Any smaller, incremental changes made to improve or clarify policy, enhance program efficacy, or incorporate new ideas will be reported as described below.

Timeframes: Program evaluation will be completed annually, to coincide with the submittal of required CWA reports and annual reviews with USEPA as a part of tracking commitments established in the annual PPG Priorities and Commitments. This will apply to the evaluation of goals, objectives, and milestones set in the Plan, as well as any requirements established as a part of the PPG.

Reporting: MassDEP will use the required NPS program annual report to USEPA to report on the findings from annual program evaluations. An enhanced report, including evaluation and adaptive measures, will demonstrate commitment to achieving the goals of the Plan, highlight the work of partners in supporting the Plan, and identify needed actions to achieve Plan goals. Information on the impacts of NPS pollution and efforts to improve and protect water quality in the state will also be reported in the 305b/303d assessments.

Monitoring/Assessment: MassDEP will primarily use data collected from its water quality monitoring programs, as well as data from third party sources (see Section 6 for more information) to conduct assessments of impaired and unimpaired waters as required by Section 303d of the CWA. The results of these assessments will be used to demonstrate incremental improvements in water quality that can be attributed to NPS pollution mitigation activities conducted on a watershed scale. The results of any studies focused on NPS pollution, including TMDLs, will also be used to develop a broader picture of the state of water quality in Massachusetts.

Coordination:

Federal/State: MassDEP will continue to work closely with USEPA on the coordination of all state and federal water quality programs in Massachusetts. Annual joint program reviews with USEPA, as well as more informal meetings, will be critical to determining how well Plan activities are progressing toward meeting goals, identifying barriers or resource gaps that could affect achievement of goals, and what priorities will shape future iterations and updates of the Plan. MassDEP will use the annual program review meeting on PPG goals and objectives, as well as the results of USEPA's annual review of the state's s.319 Program required under Section(h)(8), to gather input from USEPA on program performance as well as report on program successes/challenges. The NPS program annual report will also give USEPA an opportunity to gauge progress toward meeting NPS Plan goals. MassDEP and USEPA, over the next five-year period, will work together to share information, assess the NPS state/federal partnership, explore ways to improve communication and data-gathering, and coordinate on federal activities that may affect NPS pollution in Massachusetts.

NPS Partners: MassDEP will continue to work with the NPS partners, grantees, and other interested stakeholders to gather information on program efficacy, areas of possible improvement, and ways to enhance the efforts of others to achieve the goals set forth in this Plan. Goal 6 of this Plan describes a number of strategies to leverage stakeholder participation in the state NPS program, which will help gather needed feedback on program successes and challenges. MassDEP is also committed to participating in both national and regional forums to share successes, learn from others, and advance policy on NPS pollution.

NPS Plan Updates: MassDEP envisions that in year four of the NPS Plan, an evaluation of the Plan will be conducted. Sections of the Plan that are outdated will be identified. An analysis of the Goals section (Section 4) will be conducted, and information will be compiled on the status of each goal and the associated objectives and milestones. Any objective or milestone that cannot reasonably be completed by the end of the five-year period will be identified. In some cases, it will be necessary to reexamine or redefine these based on available information or identified barriers. In other cases, new milestones will be developed that will support the achievement of the Plan goals. Goals set in this Plan are envisioned as being carried forward from this Plan to future Plans. However, MassDEP will assess whether new goals are needed based on changes in policy at the state or federal level. Information gathered and reported in previous submissions to USEPA will form the core of the NPS Plan update. Any updates to the NPS Plan will involve the NPS Partners. The state will have an updated, USEPA-approved NPS Management Plan by September 30, 2029.

For more information on USEPA's role in overseeing the CWA s.319 grant program, visit https://www.epa.gov/nps/319-grant-program-states-and-territories. Detailed information on MassDEP's administration of the CWA s.319 grant program in Massachusetts is provided in Section 5.

CWA s.604(b): Under CWA s.604(b), each state receives 1% of its CWSRF allotment to carry out planning under CWA s.205(j) and s.303(e). At least 40% of that amount must be allocated to regional planning organizations and appropriate interstate organizations. These funds have been used to support a wide variety of NPS planning activities in Massachusetts. USEPA Region 1 provides grant funding each year to MassDEP and oversees the state's use of these funds. The USEPA grant project officer also participates in the annual regional project review committee. Detailed information on MassDEP's administration of the CWA s.604(b) grant program in Massachusetts is provided in Section 5.

NPS Management Section and USEPA Collaboration

USEPA provides funding to MassDEP and other state agencies to implement a range of programs that control NPS pollution. USEPA regularly meets with MassDEP managers and staff to identify partnership opportunities and to seek input on its program activities. Additional opportunities for collaboration between USEPA and MassDEP include implementing TMDL alternatives to address NPS pollution and coordinating SNEP Watershed Grants with MassDEP CWA s.319 NPS Implementation grants.

Figure 4.35. *BMP implementation construction across Massachusetts. (a) MACD, Westport River Agricultural Nonpoint Source Program. (b) Town of Amherst, Fearing Brook Floodplain Creation Project. (c) Town of Millbury, Armory Village Green Infrastructure Project. (d) Town of Amherst, Fearing Brook Floodplain Creation Project. (e) Mystic River Watershed Association, Stormwater Mitigation at Aberjona River (Infiltration Trench). (f) Mystic River Watershed Association, Distributed Small-Scale Street Trenches for Phosphorus Load Reduction.*

Figure 4.36. *Completed BMP implementation projects across Massachusetts. (a) Town of Spencer, Sevenmile River Watershed Project. (b) and (d) Town of Monterey, Hupi Road Drainage Improvements to Reduce Sediment Inflow to Lake Garfield Project. (c) Town of Canton, Pequit and Beaver Brook BMP Retrofit Project. (e) Town of Stoughton, Beaver Meadow Brook BMP Retrofit Project.*

Figure 4.37. *(a)(b) MACD, ACPP Technical Providers for the Palmer River Watershed. (c)(d) MACD, Western Massachusetts Agricultural Nonpoint Source Pollution Program. (e)(f) Town of Franklin, Franklin Public – Private Partnership for Stormwater GI (bioretention basin).*

Figure 4.38. *Active and Inclusive Community Youth Engagement by Mystic River Watershed Association, Distributed Small-Scale Street Trenches for Phosphorus Load Reduction. Photo source: Mystic River Watershed Association.*

5. NPS MANAGEMENT PLAN FRAMEWORK, ADMINISTRATION, AND EVALUATION

5.1 MASSACHUSETTS NPS MANAGEMENT FRAMEWORK

MassDEP has developed an integrated approach to managing NPS pollution and achieving water quality goals required under state and federal laws. While the NPS Management Section in the Watershed Planning Program is tasked with developing and implementing the Massachusetts NPS Management Plan, the framework to protect and restore the Commonwealth's water quality and water resources is defined by a variety of federal and state laws. The following section outlines key state and federal laws that provide the foundation for NPS management and summarizes the approach for implementing the Massachusetts NPS Management Plan.

5.1.1 Key Federal and State Laws

Federal Laws

CWA Section 208 Area Wide Waste Treatment Management

CWA s.208 provides guidance to states to propose solutions for water quality problems from point and non-point sources within state-specified geographic regions. Among other planning activities, CWA s.208 is intended to facilitate the development and implementation of area wide waste treatment management plans. It requires state governors to identify areas with water quality problems and designate an entity to develop these area-wide waste treatment management plans.

CWA Section 319 Nonpoint Source Management Programs

CWA s.319, enacted by Congress in 1987 through CWA amendments, establishes a national program to control NPS pollution. Under Section 319, Congress appropriates funds to states, territories and tribes to implement their approved NPSMPs. Section 319 funding supports nonregulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects to achieve implementation of BMPs and water quality goals (USEPA, 2023).

CWA Section 320 National Estuary Program

CWA s.320 authorizes the establishment of the NEP. Each NEP must develop a Comprehensive Conservation and Management Plan (CCMP) for the estuary to assess water quality; develop coordinated implementation of the plan; monitor the effectiveness of actions taken pursuant to the plan; collect and assess data on toxics, nutrients, and natural resources to identify the causes of environmental problems; develop the relationship between the internal estuarine loads and terrestrial point and nonpoint pollutant loads; and review Federal financial assistance programs and Federal development projects in accordance

with the requirements of Executive Order 12372, as in effect on September 17, 1983, to determine whether such assistance program or project would be consistent with and further the purposes and objectives of the plan prepared under this section.

CWA Section 603 Water Pollution Control Revolving Fund Loans

CWA s.603, enacted by Congress in 1987 through CWA amendments, establishes state water pollution control revolving funds, better known as Clean Water State Revolving Funds (CWSRF). The CWSRF program is a federal-state partnership that provides low-cost financing to communities for a wide range of water quality infrastructure projects, including municipal wastewater facilities, NPS pollution control, decentralized wastewater treatment systems, stormwater runoff mitigation, green infrastructure, estuary protection, and water reuse. In addition to providing funding to municipal, interstate or state agencies for water pollution control, CWSRF funds may be used for the implementation of a management program established under CWA s.319 and for the development and implementation of a conservation and management plan under CWA s.320.

Section 604(b) of the Clean Water Act

CWA s.604(b) authorizes each state to reserve 1 percent of the allotted CWSRF funds, or $100,000, whichever amount is greater, each fiscal year to carry out planning under Sections 205(j) and 303(e) of the Act.

Section 6217 of the Federal Coastal Zone Act Reauthorization Amendments (CZARA)

Section 6217 of CZARA requires states and territories with approved Coastal Zone Management Programs to develop Coastal Nonpoint Pollution Control Programs and describe how they will implement NPS pollution controls, known as management measures, for NPS from agricultural, urban, forestry, marinas, hydromodification, and riparian sources. The program is jointly administered by USEPA and the National Oceanic and Atmospheric Administration (NOAA). The Massachusetts Office of Coastal Zone Management (CZM) within the Executive Office of Energy and Environmental Affairs (EEA) is the lead policy, planning, and technical assistance agency on coastal and ocean issues and implements the state's coastal program under the federal Coastal Zone Management Act. The current Massachusetts Office of Coastal Zone Management Policy Guide – October 2011 (Policy Guide) is the official statement of the Massachusetts coastal program policies and legal authorities.

State Laws

Massachusetts Clean Waters Act (M.G.L. c. 21, §§26-53)

The Massachusetts Clean Waters Act (M.G.L. c.21, §27) confers on MassDEP "the duty and responsibility ... to enhance the quality and value of water resources and to establish a program for prevention, control, and abatement of water pollution." Similar to the federal Clean Water Act, the Massachusetts Clean Waters Act (M.G.L c.21, §§27(6), 43-44) creates a comprehensive permitting program to ensure water quality standards are met. No one may "discharge pollutants ... [or] engage in any other activity that may reasonably be expected to result, directly or indirectly, in discharge of pollutants into waters of the [C]ommonwealth ... without a currently valid permit" issued by MassDEP (M.G.L c.21, §43(2)). Permits may include not only discharge limitations but also any "additional requirements ... necessary to safeguard the quality of the receiving waters" (M.G.L c.21, §43(7)). Violation of the terms of a permit is punishable by civil and criminal penalties.

Massachusetts Wetlands Protection Act (M.G.L. c. 131, §§40 and 40A)

M.G.L. c. 131, §§40 and 40A set forth a public review and decision-making process by which activities affecting Areas Subject to Protection under M.G.L. c. 131, §40 are to be regulated in order to contribute to the following interests: (a) protection of public and private water supply, (b) protection of ground water supply, (c) flood control-storm damage prevention, (d) prevention of pollution, (e) protection of land containing shellfish, (f) protection of fisheries, (g) protection of wildlife habitat.

Watershed Protection Act (M.G.L. c. 92A §1/2)

The Watershed Protection Act (WsPA) regulates land use and activities within critical areas of the Quabbin Reservoir, Ware River, and Wachusett Reservoir watersheds for the purpose of protecting the source supply of drinking water that is treated and distributed by the Massachusetts Water Resources Authority. The law is administered by DCR's Division of Water Supply Protection. The WsPA applies only to specific towns in the DCR watershed system.

Title 5 of the State Environmental Code (M.G.L. c. 21A, §13)

The purpose of Title 5, 310 CMR 15.000, of the State Environmental Code is to provide for the protection of public health, safety, welfare and the environment by requiring the proper siting, construction, upgrade, and maintenance of on-site sewage disposal systems and appropriate means for the transport and disposal of septage. Title 5 authorizes the use of innovative and alternative (I/A) technologies to treat septic waste, particularly in Nitrogen Impacted Coastal Waters.

5.1.2 Statewide and Watershed-Specific Approaches

MassDEP's NPS Management Section in the Watershed Planning Program uses a combination of statewide programs and targeted watershed management to achieve long-term goals of restoring and protecting waters, ensuring equitable access to the benefits of the Massachusetts NPS Management Plan, and advancing climate resiliency through NPS solutions in conformance with the Nonpoint Source Program and Grants Guidelines for States and Territories (USEPA, 2024). The statewide approach targets the restoration of impaired waters and protection of healthy waters as identified on the Massachusetts Integrated List of Waters prepared by the Watershed Planning Program, while the targeted watershed approach supports the work of private and non-profit organizations that develop and implement 9e-WBPs and a-WBPs.

Statewide Approach

The framework for the statewide NPS management approach is based on the CWA, which requires states to:

1. develop surface water quality standards (SWQS),
2. conduct surface water sampling,
3. assess water quality data to determine if waters are attaining SWQS and prepare biennial water quality assessments (Integrated List of Waters), and
4. identify those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and to prioritize and schedule them for the development of a total maximum daily load (TMDL).

In Massachusetts, these activities are within the purview of MassDEP's Watershed Planning Program. The role of WPP in statewide water quality management and planning is depicted in Figure 1.3 and described in detail in Section 4, Goal 5.

Targeted Watershed Approach

Achieving or maintaining SWQS and the restoration of beneficial uses is a state and national priority. USEPA requires each state to establish a process for prioritizing and progressively addressing waters and watersheds impaired or threatened by NPS pollution. This process relies on detailed watershed assessments and development of 9e-WBPs, a-WBPs, or other watershed planning approaches to complement Massachusetts' statewide approach and support implementation work. While MassDEP has prioritized the restoration and protection of impaired and healthy waters, respectively, using the USEPA Recovery Potential Screening Tool (RPST), the development and implementation of WBPs is primarily driven by stakeholders in response to perceptions and concerns about water quality on the local or regional level. MassDEP supports stakeholder efforts to develop WBPs through the CWA s.604(b) Water Quality Management Planning Grant and implement watershed projects through the CWA s.319 Implementation Grant. The USEPA requires that any watershed implementation project funded under CWA s.319 must implement a 9e-WBP or a USEPA approved alternative watershed-based plan. Additionally, Communities with Environmental Justice populations may utilize CWA s.319 watershed project funds to develop WBPs.

Recovery Potential Screening (RPS)

A systematic, comparative methods for identifying differences among watersheds (or watershed-based, hydrologic units such as HUC12s) that may influence their relative likelihood to be successfully restored, protected or managed in other ways.

WBPs are blueprints that guide Massachusetts municipal officials, watershed groups, and other stakeholders to understand and manage conditions in their watersheds. The complexity of a WBP should be commensurate with the NPS problems the plan is meant to address. WBPs for impaired waters follow the USEPA nine-element format that characterizes the watershed to assess the causes and sources of pollution, identifies existing pollutant loads and sources, establishes water quality goals, determines load reductions and proposes management measures needed to meet those goals, sets an implementation timeline and evaluation methodology, and identifies how the public will be engaged in the implementation of the WBP. Alternative watershed-based plans may be developed to address specific unique circumstances in a given watershed, such as when the impairment is not specific to a pollutant, when the state must respond to an NPS pollution emergency or urgent NPS public health risk, when a small-scale water quality problem results from only a few sources, to protect unimpaired/high-quality waters, when addressing only agricultural NPS in an NRCS NWQI watershed, when implementing an EPA-approved Tribal NPSMP, or other circumstances.

To support stakeholders with the development of WBPs, MassDEP developed an online WBP tool (https://prj.geosyntec.com/MassDEPWBP). The tool provides a template that incorporates the nine mandatory USEPA elements and integrates information from sources including water quality assessment reports, TMDLs, and independent watershed studies to support the development of WBPs that can be used as the basis for projects to restore water quality in the Commonwealth. In response to user feedback, the NPS Management Section is incorporating improvements that will make the Tool more flexible and address new challenges such as climate change and the management of CECs. The Massachusetts Watershed Planning Program's Nine-Element Watershed-Based Plans Information website provides information about USEPA 9e-WBPs, a link to and guidance for the Massachusetts WBP Tool, and links to completed watershed-based plans.

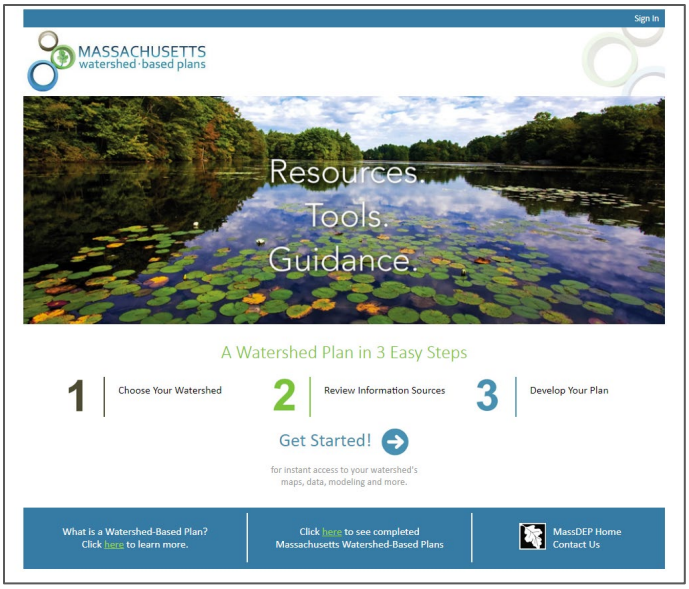


Figure 5.1. *Massachusetts Watershed-Based Plans Tool website interface.*

In addition to 9e-WBPs, MassDEP recognizes the need for additional planning efforts and supports leveraging existing watershed planning documents by MassDEP programs and NPS partners as building blocks for WBPs, subject to the conditions set forth in the *Nonpoint Source Program and Grants Guidelines for States and Territories* (USEPA, 2024). These include:

- *Federally Recognized Tribes NPS Management Program Plans*
- *FEMA Hazard Mitigation Plans*
- *NEP Comprehensive Conservation and Management Plan* and *Annual Workplans*
- *NRCS Watershed Assessments (for NWQI Implementation)*
- *TMDLs*
- *Source Water Protection Plans:* Assessment of future water supply needs and development of water supply planning and protection strategies for communities with public water supplies within a sub-basin. This would apply to both surface and groundwater sources.

- *Regional Planning*: Development of CWA s.208 and other regional-scale plans in nitrogen sensitive areas to mitigate pollution associated with nitrogen and may include other pollutants such as phosphorus.

5.2 NPS MANAGEMENT PLAN ADMINISTRATION

The Commonwealth of Massachusetts has well-developed and effective programmatic and financial systems that ensure that CWA s.604(b) and s.319 dollars are used efficiently and consistently within the Nonpoint Source Program and Grants Guidelines for States and Territories to maximize water quality benefits. An effectively administered MassDEP NPS program is expected to achieve the goals, objectives, and milestones established in this Plan. This involves managing the program with current staff resources, integrating NPS programs statewide as practicable, and leveraging partnerships to reduce redundancy and promote information sharing. The following section provides an overview of the management systems MassDEP uses to implement the state NPS Management Plan.

The Massachusetts NPS Management Plan is administered in accordance with CWA requirements and national USEPA guidance for state NPS management programs. USEPA is the granting authority for activities funded under the CWA and USEPA Region 1 provides federal oversight for MassDEP. To work effectively with USEPA, the NPS Management Section in MassDEP's Watershed Planning Program will meet grant conditions, work to achieve goals established in the annual Performance Partnership Agreement (PPA), attend regional and national NPS meetings, and provide comments on regional and national USEPA policies, guidance, and regulations concerning NPS pollution management.

5.2.1 Staffing and Support

MassDEP has historically used a portion of annual CWA s.604(b) and s.319 grant funding to support staff within the Watershed Planning Program to achieve program requirements. Funds from CWA s.319 are incorporated into the MassDEP Performance Partnership Grant (PPG). Within the PPG, CWA s.319 administrative funds will be used to support staff listed below

NPS Management Section Chief: Conducts program planning, develops objectives and priorities, provides fiscal oversight and contract development, coordinates with other programs, carries out CWA s.319 project solicitation and program coordination, and prepares the NPS workplan and annual report.

319 Grant Coordinator: Provides s.319 project scope and contract preparation, review and approval of quarterly progress reports and invoices, site visits, approval of contract deliverables, preparation of success stories, and Grant Reporting and Tracking System (GRTS) reporting.

NPS Outreach Coordinator: Conducts outreach to NPS partners, reviews and approves watershed-based plans, assists with program planning, preparation of NPS workplan and annual report, and provides technical support.

NPS Fiscal Coordinator: Oversees fiscal operations, including invoice processing, support of procurement and contracting, acquisition of supplies, financial reporting, and coordination with MassDEP fiscal staff.

In addition to supporting staff, CWA s.604(b) funds are used to support state water quality management planning activities under CWA s.205(j) and s.303(e), through staff support. The remainder of the annual award is competitively awarded to subgrant projects that are consistent with the Massachusetts NPS Management Plan. A portion of CWA s.319 program funds are used for staff salaries, staff travel for NPS purposes, office supplies, and field and laboratory equipment and supplies to support WPP monitoring staff. The remainder of the annual award is competitively awarded to projects that are consistent with the Massachusetts NPS Management Plan. The CWA s.319 grant funding that EPA awards to Massachusetts annually requires a non-federal match of at least 40% (see Section 4, Financial Partnerships for detailed information on non-federal match).

5.2.2 Grant Management

The NPS Management Section in MassDEP's Watershed Planning Program follows USEPA's Nonpoint Source Program and Grants Guidelines for States and Territories, issued on May 4, 2024, and operates under the *Massachusetts NPS Program Quality Assurance Project Plan for 319 Implementation Projects FFY 2021 – FFY 2026,* approved November 12, 2020.

All statutory and grant conditions applicable to CWA s.319 and s.604(b) grants received by the State are included in contracts and grant awards made to subgrantees so that all recipients must follow all federal requirements. The 604(b) and 319 Grant Coordinators meet with grantees at the beginning of each project to review reporting and invoicing procedures, the project site, and project plans. Quarterly reports are reviewed to ensure that work is progressing in accordance with timelines. Changes in scope or budget can be made, provided the Grant Coordinator reviews and approves the changes, which must be based on legitimate site challenges, opportunities to use funds better, or other amendments that will improve the project. Changes are not made to accommodate price increases, poor planning, or loss of match. MassDEP has several resources that are available to help grantees with invoicing and reporting procedures at https://www.mass.gov/info-details/grants-financial-assistance-watersheds-water-quality.

Finances are managed by MassDEP's Bureau of Water Resources and fiscal staff. CWA s.319 funds are provided to MassDEP through a Performance Partnership Grant (PPG) and categorical grant with USEPA. Fiscal tracking for s.319 is the responsibility of Bureau staff, who provide monthly and quarterly spreadsheets that are used by program staff to track expenditures and compliance with match and federal disadvantaged minority/women-owned business enterprise (DM/WBE) requirements.

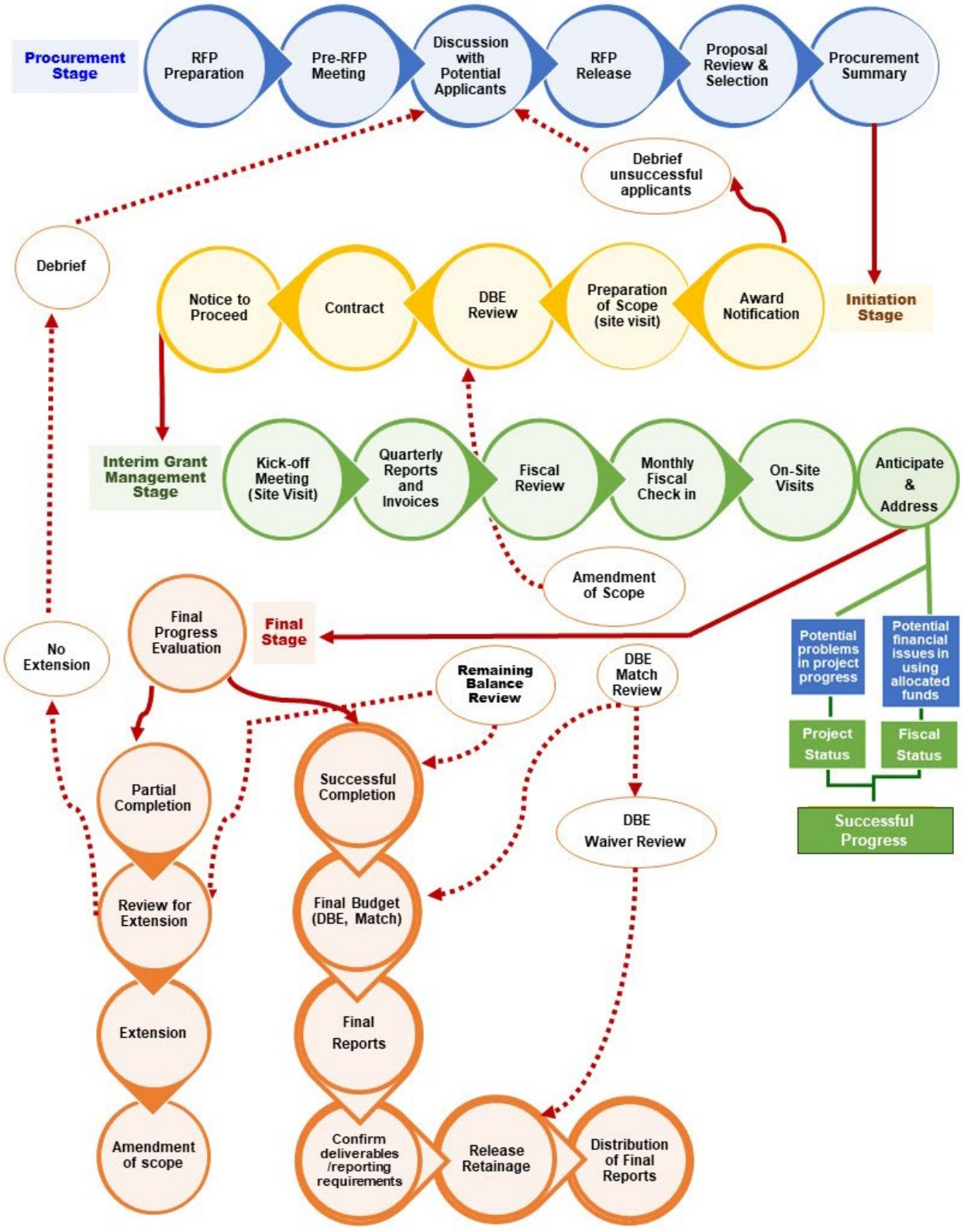


Figure 5.2. *Four stages of NPS grants management in Massachusetts.*

5.2.3 NPS Program Reporting

As outlined in USEPA grant requirements, and as committed to in the PPA and MassDEP's annual NPS workplan approved by USEPA, the NPS Management Section will submit accurate and timely reports to USEPA to provide status updates and accomplishments. The NPS Management Section will adjust reporting as necessary to comply with grant conditions, should revisions to national program guidance change reporting requirements.

Table 5.1. *Annual MassDEP NPS Management Section Reporting Requirements*

Report	Description
Annual MassDEP NPS Workplan	The workplan describes CWA s.319-related work, including how the NPS Management Section intends to implement and achieve the goals of this NPS Management Plan. In addition, the workplan describes proposed projects and activities for the year consistent with NPS Management Plan objectives and milestones.
Annual MassDEP NPS Report	The report describes progress made in implementing the NPS Management Plan, including a summary of major accomplishments and completed milestones, a description of CWA s.319-funded statewide programs and completed s.319-funded watershed projects, a list of active s.319 projects with expected completion dates, and references to information summarizing water quality improvements and NPS pollutant load reductions for the state.
Annual 604(b) Workplan	The workplan describes CWA s.604(b)-related work to assess water quality pollution in targeted basins pursuant to MassDEP priorities and the Massachusetts NPS Management Plan. In addition, the workplan provides a schedule for pass-through grant implementation and anticipated budgets for MassDEP staff and grants.
Annual 604(b) Grant Program Report	The report provides annual summary of CWA s.604(b) activities, including staff activities for positions funded by s.604(b) and pass-through grant-funded activities. In addition, the report includes comparisons of staff accomplishments with outputs/outcomes specified in the Annual 604(b) Workplan and discussion of grant project expenditures.
GRTS Reporting	Includes GRTS Load Reduction Estimates, GRTS Annual Project Reports, and GRTS Mandated Elements

5.2.4 Records and Documentation

MassDEP maintains a complete file on each active project. The s.319 Grant Coordinator maintains project-specific paper (pre-2019) and/or digital files containing, at minimum, original proposals, contract documents, plans, correspondence, progress reports, and draft and finalized Final Reports. Information related to GRTS tracking and pollutant load calculations is stored in the USEPA's GRTS online database. The NPS Fiscal Coordinator also maintains financial tracking and reporting information files and maintains the electronic financial records in the Massachusetts Management Accounting & Reporting System (MMARS).

5.3 NPS PROGRAM EVALUATION

5.3.1 NPS Program Review and Adaptive Management

The periodic, structured evaluation of any plan is a necessary activity, both to assess progress toward the achievement of goals and outcomes and to adjust strategies to account for changes in policy, science, or available information. MassDEP recognizes that successful implementation of the Massachusetts NPS Management Plan will require evaluation of goals and activities, and responding appropriately to new information. This section addresses Component 7 of Appendix A: "Key Components of an Effective State Nonpoint Source Management Program" in the *Nonpoint Source Program and Grants Guidelines for States and Territories* (USEPA, 2024). Topics covered include an overview of the principles used to develop the program review strategy, the actions MassDEP will take to evaluate the NPS Management Plan, and how information gathered will advise future updates of the Plan.

Adaptive Management

The core of the program review framework is based on the concept of adaptive management. While there are numerous definitions, this Plan relies on the definition and management actions outlined in the 2009 publication *Adaptive Management: The U.S. Department of the Interior Technical Guide* (Williams et al, 2009). The Guide defines adaptive management as "a decision process that promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood."

Adaptive management is an iterative process that occurs throughout the implementation of a plan. It relies on information gathering and assessment to advise corrective actions. Use of the process ultimately helps improve decision-making, creates a fact-based assessment of progress, and shapes future actions by building on lessons learned. As depicted in the diagram, the process is continuous and builds upon itself. An adaptive approach to program evaluation involves developing alternative approaches to meet plan objectives, predicting the outcomes of alternatives based on current information, implementing one or more of these alternatives, monitoring and assessing actions to determine progress, and using the results to update actions to achieve plan goals.

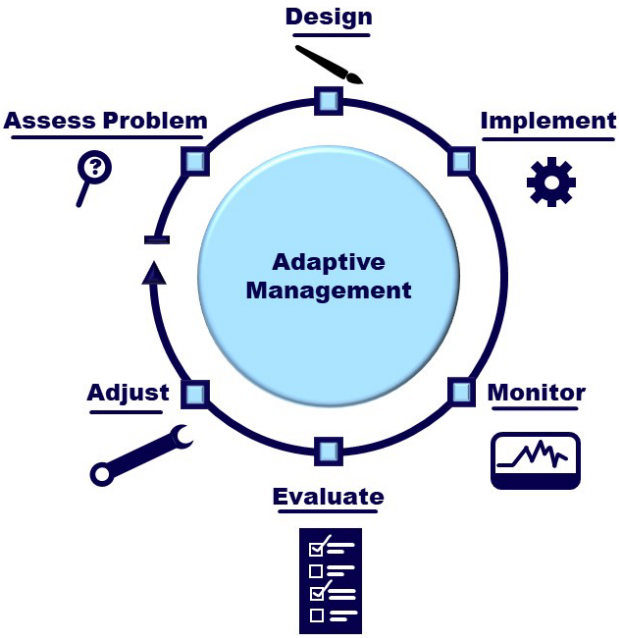


Figure 5.3. *Diagram from Adaptive Management: The U.S. Department of the Interior Technical Guide.*

Ideally, as the process is executed over many cycles, actions taken to achieve the outcomes of a plan are modified to respond to challenges. Efforts are put into large-scale evaluation of plan goals and outcomes only after responding to identified challenges and measuring whether progress is being made. Adaptive management assumes that goals and outcomes of a given plan are reasonable and reachable. However, it also acknowledges that these goals and outcomes may have been developed with incomplete or inaccurate information, and that program goals and priorities, subject to USEPA approval, may shift over time in response to new information. Adaptive management also accounts for and helps identify new barriers, limitations, or changes that could inhibit achievement of goals.

MassDEP Program Evaluation Objectives

To evaluate progress on the goals set forth in the Massachusetts NPS Management Plan, and to meet USEPA requirements, the following objectives have been established for the program evaluation strategy:

- The strategy will set timeframes for key evaluation activities.
- Evaluation efforts will be reported and shared with NPS partners and stakeholders.
- MassDEP will supplement the formal processes in the Massachusetts NPS Management Plan with more informal, ad hoc evaluations to adjust, reevaluate, or develop policy that would improve the Plan.

- The greatest effort will be placed on addressing identified challenges to, or opportunities for, improvement and achievement of the Plan's goals.
- The strategy will recognize processes, policies, or practices that support the achievement of goals.
- The strategy will encompass all elements of the Massachusetts NPS Management Plan, including policy, science, funding, partnerships, and outreach/education.

Program Evaluation Elements

Program evaluation elements are included in Goal 6, objective 7 (Table 4.4). Refer to Section 4 for details.

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APPENDIX A

Additional MassDEP Partnerships and Collaboration

ADDITIONAL MASSDEP PARTNERSHIPS AND COLLABORATION

The Massachusetts NPS management program involves collaboration between the MassDEP NPS Management Section and a broad network of partner programs. Goal 6 of Section 4 (Massachusetts NPS Management Priorities, Goals, and Actions for 2025-2029) identifies partners with whom MassDEP will collaborate to address the three primary NPS focus categories (NPS pollution from developed land, septic systems, and agriculture). Collaborative actions with these partners are defined in Table 4.6 of the Massachusetts NPS Management Plan. Additional partner organizations whose actions and efforts to manage other sources of NPS pollution are no less important and are discussed in in the following section.

Summary of Massachusetts NPS Partner Entities

Organization	Programs/Activities Related to NPS Pollution
State Entities	
Massachusetts Executive Office of Energy and Environmental Affairs (EEA)	• EEA Climate Change Initiatives • Massachusetts Environmental Trust (MET) • Dam and Seawall Repair and Removal Fund • Water Resources Commission (WRC)
Massachusetts Department of Environmental Protection (MassDEP)	• Bureau of Water Resources (BWR) supporting divisions and programs include: – Division of Watershed Management – Drinking Water Program – Wetlands and Waterways Division • Bureau of Waste Site Cleanup – Natural Resources Damages (NRD) Program
Massachusetts Department of Fish and Game (DFG)	• Division of Ecological Restoration (DER) • Division of Fisheries and Wildlife (DFW) • Division of Marine Fisheries (DMF)
Massachusetts Department of Conservation and Recreation (DCR)	• Office of Water Resources (OWR) Lakes and Ponds Program: includes monitoring and public education/outreach activities • Division of Water Supply Protection (DWSP): includes water quality sampling, monitoring, and reporting for Wachusett Reservoir and Quabbin Reservoir
Federal Agencies	
U.S. Environmental Protection Agency (USEPA), Region 1	• USEPA provides funding under s.319, 604(b), and other CWA programs • USEPA Region 1 provides programmatic oversight of state NPS Programs within the region • USEPA also has regulatory jurisdiction over certain aspects of urban stormwater pursuant to NPDES stormwater permits
U.S. Department of Agriculture (USDA)	• USDA Farm Service Agency (FSA) programs, including farm loans, the Conservation Reserve Program (CRP), and the Source Water Protection Program

Massachusetts Executive Office of Energy and Environmental Affairs (EEA):

EEA oversees the following departments: MDAR, DCR, Department of Energy Resources, MassDEP, DFG, Department of Public Utilities, and Massachusetts Environmental Policy Act Office.

a. EEA Climate Change Initiatives

In September of 2016, (then) Governor Charles Baker signed a nation-leading Executive Order, "Establishing an Integrated Climate Change Strategy for the Commonwealth." Executive Order 569 directed agencies to develop and implement an integrated strategy that leverages the state's resources to combat threats from climate change. The Order detailed coordinated action to further reduce greenhouse gas emissions, safeguard our citizens from the ongoing impacts of climate change through climate adaptation, protect the environment, and build a more resilient Commonwealth. The approach includes:

- **Massachusetts State Hazard Mitigation and Climate Change Adaptation Plan:** Working across state government and engaging over 500 stakeholders, Massachusetts developed the first-in-the-nation *State Hazard Mitigation and Climate Adaptation Plan*, a blueprint for the state's efforts to prepare for natural hazards and adapt to the impacts of climate change over the next five years. The Baker-Polito Administration's Plan is the first in the nation to take an integrated approach to climate change and natural hazard planning. Completed in September 2018, the plan uses the best science to assess risk from natural hazards and climate change and to operationalize adaptation strategies.
- **Municipal Vulnerability Preparedness (MVP) Program:** Launched in 2017, this partnership program between state government and cities and towns helps municipalities plan for and implement priority climate change adaptation projects that build resiliency and reduce risk. NPS Management Section - MVP collaboration to address the three primary NPS focus categories is described in Section 4, Goal 6 of this Plan.

b. Massachusetts Environmental Trust (MET)

Funded primarily through the sale of three environmental license plates, the MET awards approximately $600,000 annually through grants ranging from $500 to $200,000 to fund projects to benefit the environment. Since 1988 MET has awarded over $28 million. The scope of eligible activities is intentionally broad, although there is an increased focus on directing MET funds toward endangered species and river restoration. MET tries generally to support statewide interests, but does have several historical program priorities, including marine mammal protection and fish passage. MET funds are often

used as seed money early in a project for feasibility studies and other activities that serve as stepping stones toward larger projects and to leverage other grant funds, amplifying project outcomes. Coordination with the NPS Management Section can help leverage s.319 funds in areas where MET funds were used for project assessment or design.

c. Dam and Seawall Repair or Removal Program

The Dam and Seawall Repair or Removal Program is funded by a $20.1 million trust and operates as a revolving fund. While projects that enhance public safety are the priority, evaluation criteria also include improvements to public health, climate change resiliency, and the project's potential to improve or expand functions of naturally occurring systems. Water quality improvement and NPS management can be co-benefits of funded projects, particularly dam removals, but those benefits are not independently evaluated or quantified. The Fund accepts applications annually through a RFR from municipalities, nonprofit organizations, and, in the case of dams only, private owners. Financing is offered through grants, loans, or a combination of the two.

Coordination with the NPS Management Section, including CWA s.319 projects, requires linkages be made to the water quality benefits of dam removal; however, those benefits are coincidental to the fund's mandate, which is hazard mitigation. There is opportunity to co-locate NPS-related projects with dam removals if grantees are encouraged to look into multiple funding sources, particularly because these funds can be used as a match for s.319 grants.

d. Water Resources Commission (WRC)

The WRC was established in 1956 by the Massachusetts Legislature and is responsible for developing, coordinating, and overseeing the Commonwealth's water policy and planning activities to ensure that Massachusetts will have plentiful water to support health, safety, economic development, and ecological vitality for generations to come. The WRC creates policies that protect the Commonwealth's bodies of water for practical and recreational uses through:

- Development of new water resource policies for the state, including technical documents supporting such policies;
- Establish statewide Water Conservation Standards to encourage efficient use of water;
- Review and approve water regulations as related to the Massachusetts Clean Waters Act; and
- Implementation of the Interbasin Transfer Act (ITA), including the review and approval of transfers of water or wastewater between any of the Commonwealth's 28 river basins (including the Massachusetts Coastal Basin) under the ITA.

The WRC staff, housed at the Office of Water Resources at the DCR promotes water quality through the following programs and technical resources:

- Develop water resources policy and watershed planning efforts, coordinate review of proposed interbasin transfers, develop water needs forecasts for municipalities across the state in support of MassDEP's WMA permit renewal effort.
- Cooperative Program with USGS: Administer cooperative programs with USGS and manage the Rainfall Program (a network of approximately 150 precipitation observation stations, operated by volunteers throughout Massachusetts, and a precipitation database for research and analysis).
- The Flood Hazard Management Program (designated to the WRC through Executive Order 149) is the state coordinating office for the National Flood Insurance Program (NFIP). This program provides floodplain management technical information and assistance to community officials and others concerning the NFIP as well as coordinating statewide floodplain management policies to accomplish comprehensive flood loss reduction. The program also jointly administers, in conjunction with the Massachusetts Emergency Management Agency, the state's hazard mitigation programs through planning and project grants and technical assistance to community officials.

NPS Management Section and EEA Collaboration

- Over the next five years, MassDEP and EEA will collaborate to educate the public on climate change and its connection to NPS pollution.
- MassDEP and EEA collaborate to incorporate Environmental Justice in its programs and activities
- MassDEP and EEA collaborate to educate the public about the impacts of NPS pollution on Communities with Environmental Justice Populations
- EEA staff participate on the review/selection committees for s.319 and 604(b) grants.
- NPS Management Section staff have participated in the MET grant review/selection process. MET staff have participated in the s.319 grant review process.
- Substantial coordination among NPS partners occurs during the funding application process. Applicants for Dam and Seawall Repair and Removal Funds work with MassDEP, EEA, and other partners to evaluate project alternatives, including potential co-benefits and undesirable consequences, and develop the preferred alternative that is proposed for funding.

Massachusetts Department of Environmental Protection:

a. Bureau of Water Resources (BWR)

Program Description

BWR includes several divisions and programs that are charged with monitoring and regulatory activities affecting water quality and quantity within the state's major river basins. These programs focus on building local and regional partnerships to bring about water quality improvement. In addition to the Wastewater and NPDES Sections (mentioned in Section 4, Goal 6), the following programs also involve aspects of NPS management.

- **Drinking water:** The Drinking Water Program ensures that safe drinking water is delivered by public water systems according to national and state standards. In 1995 Massachusetts was the first state in the country to have a comprehensive Source Water Protection Program, including both surface water and groundwater, approved by USEPA. MassDEP's Drinking Water Program has a well-rounded Source Water Protection Program in place that reaches all public water systems in Massachusetts. The program includes:
    - Compliance and technical assistance and training;
    - Help with developing wellhead and surface water supply protection plans and local land use controls;
    - Incentives for developing and implementing local protection strategies;
    - Participating in EEA's Drinking Water Supply Protection Grant Program, which awards funds to public water suppliers for purchases of land and conservation restrictions for water supply protection;
    - Encouraging public water suppliers to partner with land trusts and other community groups;
    - Coordination with other state agencies on regulatory protection; and
    - Selecting public water suppliers to receive annual source water protection awards.

  The Program coordinates with MassDEP's WPP, EEA's Water Resources Commission, and DCR in regulating the quantity of water used for drinking water supplies and in promoting water conservation. Other activities include approval of new water supply technologies, regulating water vendors, source approval for bottled water, and public education on drinking water issues.

- **Water management:** The Water Management Act (WMA; M.G.L. c. 21G) authorizes the regulation of water withdrawals from both surface and groundwater sources in Massachusetts. The

enforceable regulations assist the Department in the comprehensive management of the Commonwealth's water resources in a manner that ensures an appropriate balance among competing water withdrawals and uses, and preservation of the water resource itself. The WMA consists of a few key components, including a registration program and a permit program.

Withdrawers typically requiring a permit include public water suppliers, 18-hole golf courses, cranberry growers, ski areas, sand and gravel facilities, fish hatcheries, agricultural users, and industrial users. Permit conditions may include but are not limited to installation of meters, limitations on daily withdrawal volume, conservation measures based on the State Water Conservation Standards, Zone II delineation for public water supply wells or firm yield determination for public surface water supplies, implementation of source water protection measures for public water supply sources, wetlands delineation and annual monitoring, and withdrawal reductions during times of low streamflow.

In 2010, EEA formed the Sustainable Water Management Initiative (SWMI) Advisory Committee. The Committee comprised a wide range of stakeholders and supported by staff, including those from EEA, the Water Management Program, DFG, and DCR. In 2012, EEA released the SWMI Framework, a precursor to the revision of regulations under the WMA. This framework, which represented over two years of dedicated research, stakeholder input and public outreach, was subsequently implemented in 2014 in revised Water Management regulations. Successful implementation of this initiative will enable clear, predictable, and science-based permitting; ensure prudent and sustainable water use; maintain healthy watersheds; and gradually improve degraded ones. Key priorities and components of the initiative include:

- SWMI is focused on helping communities meet mitigation requirements related to water consumption (surface/groundwater withdrawals), with a strong focus on groundwater.
- Some stormwater improvements (e.g., those with a groundwater recharge and filtration component) could be eligible for SWMI grant funding. Projects involving recharge improvements (stormwater capture/harvesting) have potential for crossover with NPS pollution reduction. Since SWMI is state-capital-funded and mitigation work required under SWMI is not related to NPDES requirements, most SWMI work can be used as match for s.319 projects. Projects in wellhead protection areas would need to meet the Zone 2 requirements. Furthermore, SWMI projects often help to address NPS pollution in regulated stormwater areas where work is not eligible for s.319 funds.

  - SWMI classifies subbasins by biological category and groundwater withdrawal category. The Massachusetts Recovery Potential Screening Tool (RPST) includes a SWMI layer in its ranking system.

- **Wetlands and waterways:** The Wetlands and Waterways Division ensures the protection of inland and coastal wetlands, tidelands, great ponds, rivers, and floodplains by administering and enforcing the Massachusetts Wetlands Protection Act, the Inland and Coastal Wetlands Restrictions Acts, and the 401 Water Quality Certification Program. By regulating activities that may alter wetlands, including administering stormwater standards, the Program ensures that the state's wetlands continue to provide valuable benefits such as flood control, prevention of pollution and storm damage, and protection of water supplies, fisheries, and wildlife habitat. Similar to WPP, the Wetlands Program collects and assesses quality-assured monitoring data under the federal CWA to report on the health of the state's wetlands in the 305(b) report.

NPS Management Section and BWR Collaboration

- **Drinking Water Program:** Coordination between the Drinking Water Program and NPS Management Section typically occurs when there are wellhead protection, surface water supply, or drinking water reservoir and intake issues related to NPS pollution. For example, NPS Management Section staff provide technical guidance on which BMPs may be most appropriate to protect these areas from a specific NPS pollutant or source. In addition, the s.604(b) program has funded assessment projects that are directly related to drinking water and source water protection.
- **Water Management Act Program:** NPS Management Section staff have historically participated in the SWMI mini-grant review/selection process. Many SWMI projects involve infiltration practices that are consistent with the goals of the NPS Management Section and could help leverage s.319 projects as matching funds.
- **Wetlands and Waterways Division:** Coordination between the Wetlands and Waterways Division and NPS Management Section typically occurs when there is a wetlands regulatory issue that includes an NPS pollution component, including permitting for s.604(b) and 319-funded projects.

b. Bureau of Waste Site Cleanup

Program Description

The Waste Site Cleanup program at MassDEP is responsible for ensuring timely and effective responses to over 1,500 environmental emergencies (e.g. oil spills, chemical fires) per year, as well as timely assessment and cleanup of the more than 44,000 confirmed and suspected hazardous waste sites across Massachusetts by the private parties responsible for them.

- **Natural Resources Damages (NRD) Program:** On behalf of the Secretary of Energy and Environmental Affairs, who serves as the Commonwealth's Natural Resource Trustee, the MassDEP Bureau of Waste Site Cleanup implements the NRD Program to (1) assess injuries to natural resources resulting from releases of oil or hazardous materials and substances; (2) bring claims against responsible parties for monetary damages to compensate the public for these injuries; and (3) plan and implement projects to restore, replace, or acquire the equivalent of natural resources and the services that they provide to the environment and the public. The Commonwealth of Massachusetts manages natural resources such as fish, shellfish, wildlife, rare species, groundwater, rivers, lakes, ponds, and wetlands, and holds them in trust for the public. The Trustees' duty is to exercise general care and oversight of the natural resources of the Commonwealth; to propose and carry out measures for the protection, conservation, control, and use thereof; and to remedy any damage or destruction to the environment.

  When a release of oil or hazardous materials or substances occurs, Trustees take action to:

  - Conduct a pre-assessment screen to review available information and determine if an NRD assessment can and should be performed;
  - Identify natural resources that have been lost, destroyed, or injured by toxic pollutants;
  - Determine and quantify the spatial and temporal extent of injuries;
  - Identify and evaluate feasible and cost-effective alternatives to restore resources to a baseline condition; and
  - Seek appropriate compensation from polluters in the form of monetary damages or restoration actions.

  Once these steps are completed, actions are taken to develop and implement restoration plans to restore the same or similar natural resources and services that have been injured. Program and related project funding comes from legal settlements. Funded activities depend on the nature of the natural resources and services that have been injured and the geographic area of consideration for use of funds depends on the specifics of each settlement. The scope of restoration can be very focused (e.g., in a particular sub-watershed) or extensive (e.g., throughout a major watershed). Restoration of some natural resources (e.g., migratory fish and birds) may take place in another watershed.

NPS Program and NRD Program Collaboration

Complex NRD settlements can take years to negotiate, and the assessments are confidential, limiting possible partner coordination. However, the NRD Program often uses information, data, and expertise

from partners to help assess natural resource injuries. Once a settlement is finalized, the NRD Program conducts interagency consultation as part of the process to identify potential restoration projects. NRD funds can be used flexibly (no strict funding schedule) and can be leveraged by s.319 grant projects and other programs (e.g., used as non-federal match requirement). NPS Management Section staff support NRD's review of restoration proposals and NRD strives to make applicants aware of multiple funding opportunities, including s.319 grants and 604(b) grants. Even so, opportunities exist to improve collaboration between NRD and the NPS program to better leverage funds available through both programs.

Massachusetts Department of Fish and Game (DFG):

a. **Division of Ecological Restoration (DER)**

Program Description

DER's mission is to restore and protect the Commonwealth's rivers, wetlands, and watersheds. DER accomplishes its mission by providing technical assistance and funding to priority projects chosen through a competitive selection process. Solicitation for priority projects generally occurs biennially with DER supporting approximately 50 active projects at a time. Physical restoration projects include dam removals, road–stream crossing upgrades, elimination of tidal restrictions, wetland and floodplain restoration, retired cranberry bog restoration, and urban river revitalization. Flow restoration projects focus on restoring natural streamflow affected by water withdrawals and flow manipulation. DER selects projects with the following characteristics: committed local project sponsors; identified or potential local, state, and federal project partners; the potential to leverage in-kind and monetary resources; ability to improve climate readiness; and the ability to maximize ecological gains.

DER's Water Quality Restoration Program supports Watershed groups and municipalities that are working to restore and protect water quality in their local rivers and streams. The program approached the challenge of restoring degraded or damaged aquatic systems through the implementation of targeted activities designed to improve or protect water quality at a grassroots level. Addressing NPS pollution impacts are a significant part of this program.

NPS Management Section and DER Collaboration

- DER participates in the review of s.319, 604(b), and CPR grants and the Dam and Seawall Repair Fund.

- DER works to maximize ecological gains at a large scale. Increasingly, DER is identifying and cultivating proactive potential restoration opportunities that could become priority projects. The targeted restoration opportunities, including water quality improvement, are selected due to their significant potential for restoration gains.
- During the s.604(b) and s.319 application and review processes, there is the opportunity to favorably recognize CWA projects that build on DER priority restoration projects, address NPS, and result in outcomes that benefit aquatic life, water quality, and ecological service improvements.
- DER and MassDEP share interest in a watershed-based approach to restoration. Aligning project priorities can help leverage funds provided by both agencies to achieve watershed-scale improvements. MassDEP helps teach watershed groups and municipalities how to develop WBPs through webinars and workshops. Coordination with DER on helping grant applicants understand the watershed context can help align DER and MassDEP goals by encouraging DER priority projects to consider a watershed-based approach.

b. **Division of Fisheries and Wildlife (DFW)**

Program Description

The DFW is responsible for the conservation—including restoration, protection, and management—of fish and wildlife resources for the benefit and enjoyment of the public. DFW's charge is the stewardship of all wild amphibians, reptiles, birds, mammals, and freshwater and diadromous fishes in the state, as well as endangered, threatened, and special concern species, including native wild plants and invertebrates.

DFW's statewide fisheries monitoring program generates the largest source of data related to Massachusetts fisheries. These data are very useful to MassDEP, which uses them to establish baselines for biological community assessments. For example, MassDEP uses fish population data as a metric to establish what fish use is for a waterbody (i.e., cold water fishery vs. warm water fishery).

- **Biodiversity Initiative:** The MassWildlife Biodiversity Initiative is focused on active management of habitats to directly benefit rare and declining wildlife species and plant communities. The program covers both uplands and wetlands and is primarily focused on habitats that have suffered from the impacts of human development and/or from alteration of natural disturbance processes like flooding and fires. In 2013, the state's Natural Heritage & Endangered Species Program initiated the Biodiversity Initiative Key Sites project to delineate high-priority biodiversity areas (key sites) across the state. The Biodiversity Initiative is currently conducting habitat management in several of the key sites, and activities may include reduction of pollution to improve habitat quality.

NPS Management Section and DFW Collaboration

- The NPS Management Section provides additional prioritization for s.604(b) and s.319 grant projects that protect or improve high-quality waters as recommended by DFW. Efforts to manage NPS pollution also support overall health of aquatic resources, and therefore strongly support DFW's mandate.
- DFW collects abundant water quality data that are applicable in both impaired and unimpaired waterbodies that could help with NPS Management Section prioritization. DFW is committed to providing datasets as requested by MassDEP.

c. **Division of Marine Fisheries (DMF)**

Program Description

DMF is responsible for the development and promulgation of the Commonwealth's laws governing commercial and recreational fishing activity conducted in the marine environment. The DMF conducts a variety of monitoring programs related to marine resources; those that overlap with the goals of the NPS Management Section include shellfish sanitation surveys, marine and coastal continuous bottom temperature monitoring, and eelgrass monitoring. Shellfish sanitation surveys include a bacteria assessment and some water quality monitoring. This information is used to guide both closure and management activities in shellfish areas. MassDEP uses the data from these studies for shellfish use assessments.

NPS Management Section and DMF Collaboration

- MassDEP uses DMF data for shellfish use and other water quality assessments. This information is incorporated into the NPS prioritization framework.

Massachusetts Department of Conservation and Recreation (DCR):

Program Description

The DCR Office of Water Resources (OWR) promotes water quality and conservation through several programs such as drought management, flood hazard management, interbasin water transfers, water data tracking, and lake and pond management. OWR promotes water quality in the following ways:

- The Lakes & Ponds Program conducts NPS projects primarily on DCR waterbodies within the State Forests and Parks systems. Projects include stormwater improvements, BMPs for bacteria management and control of invasive species. This program also provides technical assistance to communities and citizen groups, water quality monitoring at public beaches, and public education materials on lake issues.
- DCR also maintains a large network of roads and trails and, in recent years, has been engaging in projects to improve climate resiliency on its properties. This work and related stormwater management approaches could be enhanced through information exchange/education to help address multiple NPS goals.

NPS Management Section and DCR Collaboration

- In recent years, direct collaboration between DCR and the NPS Management Section has generally been associated with s.319-funded projects for protection/improvements at waterbodies on DCR property (e.g., swimming beaches, lakes within the State Forests and Parks system). These projects typically involve implementation of BMPs to reduce sources of nutrients and/or bacteria.
- As stated above, DCR's role in improving climate resiliency on its properties represents an opportunity for increased collaboration with the NPS Management Section through information exchange/education and development of new maintenance and BMP standards.

U.S. Environmental Protection Agency (USEPA), Region 1:

The roles of USEPA programs in the management of MassDEP's three primary NPS focus categories are described in Section 4, Goal 6 of this Plan. A summary of additional USEPA programs and activities that support NPS pollution control in Massachusetts is provided below.

Watersheds and NPS Pollution Programs

Program Description

- **Wetland Program Development Grants:** The Wetland Program Development Grants program provides funding under Section 104(b)(3) of the CWA to states, tribes, local governments, and interstate agencies for projects to develop and refine comprehensive state/tribal/local government wetland programs. Grants to Massachusetts organizations have supported the development of a wetland CAPS and a climate change adaptation strategy for the Massachusetts wetlands program.

  Examples of grant project activities include, but are not limited to:

  - Development of a state/tribal Wetland Program Plan;

- Development of training materials and tools to help local decision-makers integrate wetland protection into watershed planning;
- Development of protocols and assessment criteria that can be used to identify wetland restoration and protection priorities;
- Development of a wetland restoration/protection prioritization process that considers whether climate change may impact project success;
- Development of monitoring protocols and assessment criteria that can be used to report the ambient condition of wetland resources;
- Development of methods or strategies to incorporate wetland WQS into EPA-approved state/tribal WQS;
- Development of a sub-award program to help fund research, studies, experiments, trainings, surveys and demonstration projects by local, university, or nonprofit organizations; and
- Development of habitat and watershed-based assessments that enable landscape level analysis for use in state and federal wetland regulatory and planning programs.

- **Long Island Sound Study (LISS):** The LISS is a USEPA-led partnership of federal, state, interstate, and local agencies, universities, environmental groups, industry and the public working to protect and improve the health of the Sound. The Connecticut River, Housatonic River, and Thames River watersheds are partially in Massachusetts and drain to the Sound. MassDEP is a member of the LISS Program's Management Committee. To address ongoing water quality degradation, USEPA approved a TMDL in 2001 calling for nitrogen reductions across the Sound's watershed, including the entire Connecticut River basin. Due to improvements under the TMDL, water quality is improving with the area of hypoxia on a downward trend. However, the Sound remains impaired due to nitrogen loads and additional point and NPS action is needed to meet WQS for dissolved oxygen and address other eutrophication-related impairments in embayments and harbors. As a result, USEPA is implementing a collaborative strategy to continue progress on nitrogen reductions, in parallel with the states' continued implementation of the 2001 TMDL, to achieve WQS throughout Long Island Sound and its embayments and nearshore coastal waters.

- **Drinking Water Program**
  - **Source water protection:** Source water assessments are mandated in the Safe Drinking Water Act and source protection is encouraged as part of USEPA's Drinking Water program. Many federal, tribal, regional, and local programs have tools and resources that can be used to protect drinking water. Source water protection can benefit, and benefit from, other USEPA programs,

other federal programs, and non-governmental programs. For more information, visit USEPA's Office of Ground Water and Drinking Water.

- **Sole Source Aquifer (SSA) Protection Program:** USEPA defines a sole or principal source aquifer as one that supplies at least 50% of the drinking water consumed in the area overlying the aquifer. These areas may have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend on the aquifer for drinking water. For convenience, all designated sole or principal source aquifers are referred to as SSAs.

USEPA Region 1 has designated 7 SSAs in Massachusetts:

- Broad Brook Basin of the Barnes Aquifer
- Canoe River
- Cape Cod
- Head of the Neponset
- Martha's Vineyard
- Nantucket
- Plymouth/Carver

The SSA Protection Program is authorized by section 1424(e) of the Safe Drinking Water Act of 1974 (Public Law 93-523, 42 U.S.C. 300 et seq.). SSA designation is one tool to protect drinking water supplies in areas where there are few or no alternative sources to the groundwater resource and where, if contamination occurred, using an alternative source would be extremely expensive. The designation protects an area's groundwater resource by requiring USEPA to review certain proposed projects within the designated area. All proposed projects receiving federal funds are subject to review to ensure that they do not endanger the water source. For more information, visit http://www.epa.gov/dwssa.

- **Ocean and Coastal Protection**
  - **National Estuary Program (NEP):** The NEP was established under Section 320 of the 1987 CWA Amendments as a USEPA place-based program to protect and restore the water quality and ecological integrity of estuaries of national significance. USEPA has designated four NEPs whose watersheds extend into Massachusetts: the Buzzards Bay NEP, MassBays, the Narragansett Bay Estuary Program, and the Long Island Sound Study. Section 320 of the CWA calls for each NEP to develop and implement a CCMP. The CCMP is a long-term plan that contains specific targeted actions designed to address water quality, habitat, and living

resources challenges in its estuarine watershed. New guidance that requests 10-year updates or revisions to the CCMP for each NEP was established in 2018. All four NEPs provide USEPA funding and/or expertise to Massachusetts communities to support water quality monitoring and water restoration and protection efforts. This work may include activities in regulated stormwater communities, helping support NPS Management Plan goals in those areas. For example, Buzzards Bay NEP collaborates with organizations and towns to apply for s.319 grants and provides technical assistance to groups seeking 604(b) grants for water quality assessments.

For more information, visit http://water.epa.gov/type/oceb/nep/index.cfm#tabs-2.

- **Climate Resilience:** Adapting to more extreme precipitation events, sea level rise, and other coastal issues is of particular importance in the Northeast climate region. USEPA's Resilience and Adaptation in New England (RAINE) database is a resource for municipalities, states, and other organizations to share their experiences regarding climate change adaptation projects, including lessons learned, project highlights, implementation costs, and plans, as well as to identify potential project sites and partners for collaboration. Users can search the database by various categories, including state, population, topic, impacts, program, partners, tools, funding, and plans. Climate resilience is incorporated into the NEP and many of USEPA's programs. The 2014 *EPA New England Regional Climate Adaptation Plan* describes the vulnerability of various regional programs, including the Nonpoint Source Management Plan Program, to chronic and episodic impacts of climate change and identifies priority actions to address the vulnerabilities. In response to President Biden's Executive Order (EO) 14008, Tackling the Climate Crisis at Home and Abroad, USEPA created an agency-wide *Climate Adaptation Action Plan* in October 2021. In October 2022, the *2022 EPA Region 1 Climate Adaption Plan* was released. For more information about the overall impacts of climate change in the Northeast, in addition to water impacts, visit: https://www.epa.gov/raine.

- **Pollution Prevention**
  - **Soak Up the Rain:** *Soak Up the Rain* is a collaboration between USEPA Region 1 and state agencies, universities, watershed groups, and other organizations. This program is a public outreach campaign to raise awareness about polluted stormwater runoff and to encourage actions to prevent impacts from polluted stormwater. The website includes outreach tools; educational materials; guidance documents; a series of regular webinars on a variety of topics; and other resources for citizens, municipalities, and others. For more information, visit https://www.epa.gov/soakuptherain.

- **Green infrastructure:** Green infrastructure is an approach that communities can choose to maintain healthy waters, provide multiple environmental benefits, and support sustainable communities. Unlike single-purpose gray stormwater infrastructure, which uses pipes to dispose of rainwater, green infrastructure uses vegetation and soil to manage rainwater where it falls. By weaving natural processes into the built environment, green infrastructure provides not only stormwater management, but also flood mitigation, air quality management, and much more.

  Since 2007, USEPA has actively supported the use of green infrastructure to manage wet weather. USEPA has released a series of policy memos encouraging the use of green infrastructure to meet regulatory requirements, as well as a series of strategic agendas describing its actions to promote green infrastructure. A central theme of recent Agendas is engaging with local communities through community partnerships and technical assistance programs. Since 2011, USEPA has established partnerships with 10 communities and provided technical assistance to more than 20. In 2014, USEPA provided $860,000 to 14 communities throughout the United States for implementation of green infrastructure–related projects. USEPA Regions are key players in all of these efforts, and many offer a wealth of targeted information on their websites. For more information, visit https://www.epa.gov/green-infrastructure.

- **Water Quality Trading Policy:** In February 2019, USEPA released a new water quality trading policy memorandum to help states, tribes, and stakeholders use market-, incentive-, and community-based programs to reduce excess nutrients and improve water quality. The memorandum reinforces USEPA's support for water quality trading and identifies six principles designed to encourage the development and implementation of trading programs. The sixth principle is "Financing opportunities exist to assist with deployment of nonpoint land use practices." The memorandum encourages the use of bonds, s.319 grants, CWSRF, and Water Infrastructure and Innovation funds to promote integrated point and NPS pollutant reduction strategies. In addition, the memorandum describes financial and technical support available through USEPA's Water Finance Center. For more information, visit https://www.epa.gov/nutrient-policy-data/water-quality-trading-memos.

USEPA also has regulatory jurisdiction over certain aspects of urban stormwater pursuant to NPDES stormwater permits. Key activities related to urban stormwater that USEPA Region 1 plans to undertake in Massachusetts over the next five years are summarized below. Although the information below focuses on NPDES permitting activities for point source discharges, it is included for reference in identifying and implementing activities for NPS stormwater runoff from similar areas and facilities.

- **Urban Areas: Stormwater Management**
  - Region 1 issued a new small MS4 NPDES general stormwater permit for regulated communities in Massachusetts on April 4, 2016, which became effective on July 1, 2018, and was administratively continued on July 1, 2022.
  - Region 1 offers a stormwater management optimization tool, called Opti-Tool, which allows communities to assist with estimating the phosphorus, nitrogen, total suspended solids, and zinc pollutant load reduction that can be expected from the implementation of stormwater BMPs.
  - USEPA provides a wide range of information about stormwater and available control practices and compliance tools on the agency website.
  - Region 1 will continue to offer its *Soak Up the Rain* materials to educate homeowners, businesses, and communities about practices they can use to reduce stormwater impacts on water resources.

- **Urban Areas: Erosion, Sedimentation, and Construction Site Control**
  - USEPA issued a new national Construction General Permit in January 2022. Information necessary to comply with the permit is available at https://www.epa.gov/npdes/2022-construction-general-permit-cgp.

- **Urban Areas: Roads and Highways**
  - Region 1 issued a new individual stormwater permit to the Massachusetts Department of Transportation (DOT) in late 2019.

NPS Management Section and USEPA Collaboration

USEPA provides funding to MassDEP and its partners to carry out a range of programs that control NPS pollution. The agency regularly meets with MassDEP managers and staff to identify partnership opportunities and to seek input on its program activities. Additional opportunities for collaboration between USEPA and MassDEP include implementing TMDL alternatives to address NPS and coordinating the SNEP Watershed Grants with s.319 funding.

United States Department of Agriculture (USDA):

Program Description

The role of USDA programs in the management of MassDEP's three primary NPS focus categories are described in Section 4, Goal 6 of this Plan. A summary of additional USDA programs and activities that support NPS pollution control in Massachusetts is provided below.

Farm Service Agency (FSA)

FSA offers a number of loan programs that farmers can use for soil and water conservation and protection. More information is available at https://www.fsa.usda.gov/programs-and-services/farm-loan-programs/index. In addition, FSA coordinates several conservation-focused programs that are relevant to NPS management. These include:

- **Conservation Reserve Program (CRP):** The CRP is a land conservation program. In exchange for yearly CRP rental payments, farmers agree to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality. CRP contracts are 10–15 years in length. The long-term program goal is to re-establish valuable land cover to help improve water quality, prevent soil erosion, and reduce loss of wildlife.
- **Source Water Protection Program:** FSA partners with the National Rural Water Association to provide water technicians for each state to coordinate local teams that work with USDA staff to create plans that identify pollution prevent needs. These Rural Source Water Protection plans identify potential pollution sources, voluntary measures that agricultural producers may install to prevent water pollution, and entities and resources that can help implement the plan.

NPS Management Section and USDA Collaboration

- NPS Management Section staff participate in the NRCS State Technical Committee meetings that determine distribution of EQIP funds and related Farm Bill program priorities in Massachusetts.
- NRCS collaborated with the NPS Management Section, MDAR, and MACD in implementation of the NWQI for the Palmer River. Through that initiative, NRCS and s.319 funds were leveraged with non-federal contributions to provide conservation planning and practice implementation on agricultural lands in the Palmer River subwatershed. NRCS funding is available to identify additional NWQI watersheds in Massachusetts to provide similar, targeted support to farmers for controlling NPS from agricultural practices. The NPS Management Section and NRCS will collaborate to identify additional priority watersheds in which to conduct similar projects.

APPENDIX B

Massachusetts Office of Coastal Zone Management
Coastal Nonpoint Pollution Control Program

15-Year Program Strategy (2014 to 2029)
5-Year Implementation Plan (2014 to 2019)

Note the Coastal Nonpoint Pollution Control Program 15-Year Program Strategy (2014 to 2029) with 5-Year Implementation Plan (2014 to 2019) is a living planning document and portions of the document may not reflect current conditions and will be updated by CZM as part of their ongoing planning process. Implementation of the MassDEP Circuit Rider Technical Assistance has continued with the hiring of two new circuit riders by MassDEP, such that all regions have circuit riders. MassDEP will continue to partner with CZM on Nonpoint Source Pollution Control efforts.

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Introduction

In the 1998 Final Administrative Changes to the Coastal Nonpoint Pollution Control Program (CNPCP) Guidance, the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (USEPA) required states to develop a 15-year program strategy and a 5-year implementation plan as part of their CNPCP. The guidance emphasizes the need for state coastal programs to coordinate the development of this fifteen-year strategy and five-year plan with their respective Section 319 Nonpoint Source Programs.

This 15-Year Program Strategy/5-Year Implementation Plan presents updated long-term goals (15-year; 2014 to 2029) and 5-year (2014-2019) action/implementation efforts for the Massachusetts Office of Coastal Zone Management (CZM) CNPCP. This document was developed and is being submitted in coordination with the 2014 update to the Massachusetts Nonpoint Source Management Plan. This document is an update to the CNPCP prepared in 2000, and was developed through a series of planning sessions conducted between December 2013 and February 2014, involving staff of CZM, the Massachusetts Department of Environmental Protection (MassDEP), the Massachusetts Executive Office of Energy and Environmental Affairs (EEA), the USEPA, and Geosyntec Consultants. Additional input on specific topics was also provided from other CZM partner agencies, including:

- Massachusetts Department of Agriculture (MDAR);
- Massachusetts Department of Conservation and Recreation (DCR);
- Massachusetts Department of Transportation (MassDOT);and
- Massachusetts Division of Ecological Restoration (DER).

To provide appropriate historical context and sense of continuity between the previous and current versions of the 15-Year Program Strategy/5-Year Implementation Plan, each section lists previous actions that have been achieved and/or are no longer planned for the period of 2014 to 2019.

For each of the six major source categories of the CNPCP, this document describes important long-term goals to be realized within a 15-year strategy timeframe. The document then lists specific implementation actions and benchmarks that can be anticipated to occur within the 5-year plan window. For each action item, the responsible organizations have been listed. In some cases, the specific action item may be an implementation effort that has been planned by the organization, but which requires funding that has not yet been secured.

Unless otherwise noted in the CNPCP, action items will be worked on continuously over the 5-year planning period, rather than in specific years. Massachusetts CZM, as the coordinator of the CNPCP, will review the 5-year action/implementation efforts annually until 2019. In 2019, CZM will complete a more comprehensive review of implementation efforts, report on progress, shortcomings, and new opportunities. A renewed 5-year implementation plan will be developed for the 5-year period of 2019 to 2024. In addition, the 15-year long term goals will be reviewed and revised if necessary.

URBAN AREAS

A. Urban Areas: Stormwater Management

1. Long Term (15 Year) Goal:

By 2029, implementation of the Massachusetts Stormwater Management Standards will continue to reduce water quality impairments, remove waters from the state's 303d list, restore segments not supporting, and protect supporting beneficial uses such as shellfish beds and swimming beaches.

2. Actions/Implementation Efforts (to 2019):

The following benchmarks and actions are anticipated:

- Increase compliance of stormwater policy implementation through continued technical assistance and education efforts by CZM, MassDEP, MassBays and Buzzards Bays staff, including:
    - Specific targeted hands-on technical assistance to local officials, such as Conservation Commissions, through CZM, MassDEP, NRCS, and the MassBays and Buzzards Bay National Estuary Programs (NEPs).
    - Contingent on MassDEP funding, guidance documents, technical assistance and workshops related to stormwater management.
    - Offer NPDES Phase II assistance to affected municipalities, such as workshops, technical assistance, and guidance materials.
- Increase compliance and enforcement of stormwater plans through enforcement activities of local conservation commissions and MassDEP, including inspections at project sites. The role of MassDEP will be in support of conservation commissions.
- Increase compliance and implementation of stormwater plans through grants, including:
    - CZM will continue to implement the Coastal Pollutant Remediation (CPR) grant program, funding stormwater assessment and remediation projects in coastal watershed

municipalities. Require CPR grant recipients to (1) complete an Operation & Maintenance (O/M) Plan for relevant implementation projects and (2) provide an agreement and documentation of O/M activities for the life-cycle of the BMP.

- In addition to mid-year project summaries and end-of-year project reports provided to NOAA, CZM will develop an indicative project summaries informational document for the CPR grant program. These summaries will provide information (project description, constituent of concern and resource, remediation scheme/technology and any follow-up info) for past CPR projects. The goal of the document is to provide information (in the form of brief case studies) to municipal decision-makers regarding stormwater mitigation options. CZM will maintain this information on its web page.
- Other grant programs that promote development and implementation of Low Impact Development and Green Infrastructure practices and other green technology stormwater mitigation practices.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

- Continued implementation of the MassDEP Circuit Rider Technical Assistance in each regional office. (*This will not be continued due to staffing limitations.)*
- MassDEP to re-write of the Hydrology Guidance document for conservation commissions, local officials, and others. *(This has been achieved.)*
- Continued review and fine-tuning of the Massachusetts Stormwater Standards through the Stormwater Advisory Committee and Technical committee. *(This has been achieved.)*
- CZM, working with MassDEP, STEP, and UMass, will develop and implement pilot testing project for innovative stormwater treatment technologies, evaluating performance of separate installations of several different technologies. *(This has been achieved.)*
- MassDEP will work with local communities and watershed groups to implement stormwater "daylighting" efforts in the Charles and Neponset. Stormwater daylighting is a technique that uncovers stormwater conduits and exposing (or restoring) the channel as a more natural streambed. *(This has been achieved.)*

B. Urban Areas: Onsite Disposal Systems (Title 5)

1. ***Long Term (15 Year) Goal*:**

By 2029, reduce impairments to surface waters and drinking water supplies through improved treatment and disposal of wastewater.

2. Actions/Implementation Efforts (to 2019):

The following benchmarks and actions are anticipated:

- Conduct outreach to communities (especially in Barnstable County) on EEA's Alternative Nutrient Attenuation Strategies Policy.
- MassDEP will continue to offer technical assistance through specific training to local Boards of Health, soil evaluators, and system inspectors.
- MassDEP will continue funding assistance programs, including the Community Septic Management Program and the Clean Water State Revolving Fund.
- MassDEP will continue to evaluate and approve proposals for facilities planning that include an integrated approach to wastewater management, i.e. the use of on-site system upgrades coupled with conventional wastewater treatment facilities to address town-wide or area-wide wastewater needs in an economical fashion. Continued activities will include providing enhanced subsidies, in the form of 0% interest loans from the Clean Water State Revolving Fund, to nutrient management projects resulting from comprehensive wastewater management plans. Also included is continued implementation of the Section 208 plan for Cape Cod, which was developed in part to encourage and facilitate the development and implementation of area-wide waste treatment management plans.
- Continued and expanded use of MassDEP web site to act as a clearinghouse for publications and information related to disposal of wastewater.
- MassDEP will continue to evaluate and revise the Title 5 regulations, as appropriate, to improve the regulations as necessary.
- MassDEP will issue wastewater management guidance to municipalities to support correction of major problems in most environmentally sound manner. For the planning period of 2014-2019, this will be achieved through the anticipated completion and approval of the Section 208 Plan for Cape Cod by 2015.
- MassDEP will continue to support the work of the Massachusetts Septic System Test Center, contributing to the reduction of coastal nonpoint contamination by onsite disposal systems in the followings ways:

- The Test Center will provide verification of contaminant (nutrient, organic load and pathogen) removals by innovative/alternative (I/A) onsite disposal systems which can provide superior quality of effluent discharged to ground water.
- The Test Center will provide verification of the performance of conventional Title 5 onsite disposal systems to serve as benchmark for comparison with I/A technologies and will provide needed data on levels of contaminants released to ground water by conventional systems.
- The Test Center will provide a platform for research and development testing of new onsite disposal technologies, components and materials for technology vendors and MassDEP, which may improve both I/A and conventional performance. The Test Center will provide outreach on I/A and conventional technologies to Boards of Health, health agents, system designers and the public in the form of facility tours and training workshops, published reports on verified technology performance furnished to MA Boards of Health, publication of testing results on the Test Facility webpage on the Buzzards Bay NEP website, and through print media articles.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

- MassDEP will continue education efforts for affected public and others, including Wastewater News and Waterlines. *(This has been achieved.)*
- MassDEP and STEP will continue to encourage the development of and approve innovative/alternative technologies for the onsite treatment and disposal of sewage. *(This has been achieved.)*

C. Urban Areas: Erosion, Sedimentation and Construction Site Control

1. Long Term (15 year) Goal:

By 2029, through continued implementation of the Wetlands Protection Program performance standards, local site planning and project review through the Subdivision Control Act, and pro-active education on efforts such as conservation planning and sensitive development, the quantity of water resources assessed as non-supporting due to turbidity or suspended solids from site development sources will be substantially reduced.

2. Actions/Implementation Efforts (to 2019):

The following benchmarks and actions are anticipated:

- Through MassDEP and local conservation commissions: ongoing compliance and enforcement of erosion control measures at project sites.
- Technical assistance to assist Massachusetts communities in their development, adoption, and implementation of these local by-laws and regulations through the Massachusetts' National Estuary Programs (Massachusetts Bays NEP and Buzzards Bay NEP) and other state efforts such as the CZM regional offices and MassDEP wetland staff.
- Regional planning agencies in Massachusetts, such as the Cape Cod Commission, the Metropolitan Area Planning Council, the Merrimac Valley Planning Commission, and the Southeastern Regional Planning and Economic Development District, will also provide direct assistance to communities to support local level control of stormwater, erosion and sediment and chemical controls.
- The Middlesex Conservation District will continue to offer the program service to its 52 communities to review Erosion and Sedimentation Control Plans for all soil disturbing projects over 5000 sq. ft. The district charges on an hourly basis so the program has built in sustainability.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

- North Shore Region Conservation Subdivision Pilot: CZM to continue to work with an alliance of local officials, developers, engineers, realtors, conservation organizations, and state agencies to create and promote innovative sustainable development designs that protects land and water resources while maximized the economic potential. The Alliance intends to begin bylaw distribution and outreach program in spring 2000, focusing on the Parker River Area of Critical Environmental Concern (ACEC) communities in Phase One. Phase Two will include targeting communities outside the ACEC but having impact to that ecosystem. *(This has been achieved.)*
- The current publication, *Massachusetts Guidelines for Erosion & Sediment Control in Urban and Suburban Areas,* will be scanned and posted on the Web in its entirety (including pictures). *(This has been achieved.)*
- MassDEP, with CZM, MassBays NEP, and Buzzards Bay NEP, will work to develop state-endorsed model by-laws and regulations for local municipalities. (Guidelines related to this topic were provided in the *Massachusetts Guidelines for Erosion & Sediment Control in Urban and Suburban Areas.)*

D. Urban Areas: Watershed Protection

1. Long Term (15 Year) Goals:

a. Watershed Protection

By 2029, CZM and its partner agencies will develop and implement a comprehensive plan to assess and rank watersheds within the coastal zone, with the intent of:

1. Identifying and prioritizing the protection of high-quality watersheds;
2. Establishing programs to educate stakeholders on the importance of protection of these high quality watersheds;
3. Targeting resources to protect these high quality watersheds from future environmental impacts to the greatest extent practical; and
4. Aligning partner program resources to enhance and improve existing efforts to protect water quality in these high quality watersheds.

b. Climate Change Adaptation

By 2029, working with partner agencies on the local, state, and federal level, CZM and its partner agencies will:

1. Develop and implement watershed-based strategies to plan for and implement practices that mitigate the adverse effects of climate change on waters and wetlands within the coastal zone; and
2. Work with coastal zone stakeholders to plan for and implement adaptations to existing infrastructure to increase resilience and protect critical habitats from the adverse effects of climate change.

2. *Actions/Implementation Efforts (to 2019):*

a. Watershed Protection

- MassDEP, CZM and other program partners will continue work to monitor and assess sources of NPS contamination in the Massachusetts coastal zone;
- CZM will continue to fund watershed protection projects through the Coastal Pollution Remediation (CPR) grant program, including projects to protect high quality watersheds.

- CZM staff will coordinate with MassDEP staff to identify high priority Section 319 grant projects within the Massachusetts coastal zone, including projects to protect high quality watersheds, which will reduce NPS pollutants through improved stormwater management practices and other techniques.
- CZM will coordinate with MassDEP, MDAR and USDA-NRCS to implement Agricultural BMP's within high priority areas of the Massachusetts coastal zone.
- CZM, MassDEP and other agency partners will make recommendations for the protection and preservation of high priority lands that have sensitive habitat and/or will further the goal of protecting high priority resource areas from NPS pollution.
- CZM and MassDEP will continue to promote the promulgation of municipal conservation zoning bylaws or similar environmentally prudent zoning to protect natural resources from NPS pollution;
- CZM, MassDEP and other agency partners will continue to engage watershed organizations and municipalities in NPS pollution control through outreach and education efforts.

b. **Climate Change Adaptation**

- Update applicable CZM policy to include climate change as a new driving factor for NPS pollution causes and solutions.
- Working with partner agencies, promote new regulations and broaden existing programs to incorporate climate change for projects designed to increase infiltration, improve stormwater quality, and protect groundwater.
- Working with local agencies, units of government, and stakeholder organizations, increase awareness of the effects of climate change on water quality and promote solutions that mitigate the effects of climate change on water resources.
- Support and promote watershed planning by NPS partner agencies, including analysis and consideration of the effects climate change will have on current and future NPS pollution sources.
- Promote the design, siting, and construction of BMPs that address NPS pollution and are capable of withstanding the effects of climate change on water levels, flooding frequency, wave action, and related factors.
- Support projects to restore aquatic habitats adversely affected by NPS pollution and climate change.
- Support efforts to research, design, and demonstrate BMPs that address NPS pollution and are resilient to climate change impacts.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

- Watershed teams will provide technical assistance and guidance to watershed organizations and municipal boards regarding the implementation of the Phase II Stormwater rules. *(This has been achieved.)*
- Watershed will implement rapid watershed planning tools and techniques to assess small subwatersheds, using impervious cover as the indicator for stream quality. *(This has been achieved.)*
- Watershed teams will engage local constituents and work to control NPS pollution by weighing in on NPDES permits and implementing TMDL's before, during, and after the public participation process. *(The watershed teams referenced no longer exist.)*
- The Watershed Initiative supports the efforts of watershed organizations and other groups by offering various funding opportunities, such as watershed stewardship service contracts to make environmental improvements; volunteer monitoring grants for volunteer groups to collect water quality data, and Communities Connected by Water service contracts for watershed organizations to work with municipalities to integrate growth planning with environmental protection. *(The Watershed Initiative no longer exists.)*

E. Urban Areas: Roads and Highways

1. Long Term (15 Year) Goal:

By 2029, all new state and local roads, highways, bridges, and facilities will be full compliance with the Stormwater Management Standards or MS4 permit where applicable and practicable. Existing roads, highways, bridges and facilities will incorporate adequate NPS Best Management Practices when reconstruction, widening or drainage work is planned OR such BMPs will be programmed when water quality assessments demonstrate violations of standards.

2. Actions/Implementation Efforts (to 2019):

The following benchmarks and actions are anticipated:

- State Highway Facilities will continue compliance through implementation of the MassDOT Environmental Management System.

- MassDOT and the MADCR will implement NPDES Phase II requirements within established times.
- MassDOT will obtain an Individual MS4 Permit.
- MassDOT will finalize its assessment of highway drainage to impaired waters.
- Where warranted, MassDOT will continue to design and construct water quality mitigation projects to reduce pollutant loading to the maximum extent practical.
- MassDOT will update its Stormwater Handbook for Roads and Bridges.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

- A minimum of four regional workshops will be held on the new MHD policy/"meeting-the-stormwater-standards" document (MHD Volume 1). *(This has been achieved.)*
- MHD will finalize the road and highway engineering and BMP specifications document (MHD Volume 2). *(This has been achieved.)*
- A minimum of four regional workshops will be held on the MHD Volume 2 Document. *(This has been achieved.)*

MARINAS AND RECREATIONAL BOATING

A. Marinas and Recreational Boating: Marina Siting

1. Long Term (15 Year) Goal:

By 2029, all new, upgraded and expanded marine facilities sited in Massachusetts receive planning and implementation assistance from the CZM marina technical assistance staff prior to or during CZM federal consistency or MEPA review. As a result, new and expanded marinas are designed and sited in such a manner as to minimize impacts on water quality and aquatic resources.

2. Actions/Implementation Efforts (to 2019):

The following actions and benchmarks are anticipated:

- During pre-application technical assistance or permitting review (by CZM or other state and federal agencies), designs for new, upgraded or expanded marinas will incorporate pump-outs, improved fueling facilities stormwater management, and hull maintenance facilities where feasible.

- Continue to Maintain the Massachusetts Clean Marina Guide on the CZM website.
- Continue to provide technical assistance related to the siting, design, construction and operation of marine facilities.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

- CZM will publish the marina guidance document and deliver it to marine facility operators and other target audiences, such as town harbormasters, marine industry reps, and others. *(This has been achieved.)*
- CZM and its contractors will hold workshops throughout Massachusetts; to publicize and teach the use of the marina guidance document. *(This has been achieved.)*
- CZM will run a pilot small-grants program to fund pollution prevention technologies at public and private marine facilities. *(This has been achieved.)*

B. Marinas and Recreational Boating: Marina Operation

1. Long Term (15) Goal:

By 2029, implementation of the Massachusetts Clean Marina Program, federal regulatory programs, and state regulatory programs (CZM federal consistency, Stormwater Policy and Management Standards, MEPA, and Chapter 91) will reduce water quality impairments, remove waters from the state's 303 d list, restore segments not supporting, and protect supporting beneficial uses such as shellfish beds and swimming beaches.

Action/Implementation Efforts (to 2019):

CZM will continue to provide technical assistance related to the siting, design, construction and operation of marine facilities.

- USEPA carried out an extensive technical assistance program for marina owners in the mid-2000s. USEPA does not currently anticipate any new assistance initiatives over the next 5 years for marina operators.
- USEPA will issue a new multi-sector general permit, which will include requirements for marinas.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

- CZM and the Massachusetts Office of Technical Assistance and Technology (OTA) marina technical assistance team is created and staff are educated and prepared to provide expertise in the siting, design, construction and operation of marine facilities. *(This has been achieved.)*
- CZM will publish the marina guidance document and deliver it to all marine facility operators and other target audiences, such as town harbormasters, marine industry reps, and other. *(This has been achieved.)*
- Boater education brochures will be developed and distributed to inform the boating public of issues concerning recreational boat use and water and aquatic habitat degradation. Brochures will contain recommendations and steps to prevent and minimize such impacts. *(This has been achieved.)*
- CZM and its contractor will hold vie workshops will be held in fall 2000 in five regions throughout Massachusetts' to publicize the release of the document and provide specific technical assistance and education. Contingent on available funding, a second and third phase of workshops will be run in 2001 and 2003. *(This has been achieved.)*
- CZM will run a pilot small-grants grogram to fund BMPs and other environmental improvements for existing marine facilities. This program will likely provide small grants, cost-share or no/low interest loans for: vacuum sanders for hull maintenance; hull washing facilities; purchase, operation and maintenance of pump-out facilities; public and boater education; fueling station retrofitting and maintenance; and solid, liquid, recyclable and hazardous waste management. (*This was achieved using one-time funding from USEPA*.)
- Contingent on available funding, a Clean Marina Program will be piloted and evaluated to encourage marinas to develop and implement marina management plans. Participants in the program receive publicity from the state, a flag to fly over their facility and are free to use a Clean Marina logo in any advertisements and correspondence. Program is developed as a positive approach, which recognizes the efforts of marinas to protect the resources that provide their livelihood. (*This program was piloted and dropped due to lack of industry interest.*)
- CZM and OTA will pilot a technical assistance and inspection program. In two ACECs, all marina operations will be offered a visit and review for implementation of good housekeeping and BMPs. Technical advice and steps to implement BMPs will be delivered through and audit plan. (*This action item has been supplanted by the new multi-sector permit which gives marina enforcement jurisdiction to EPA.)*

- CZM will work with MassDEP and other agencies to explore mechanisms for the coordination of annual marina operator's license with MassDEP's Chapter 91 program, and how efforts may be initiated to conduct inspections, make NPS control recommendations, and utilize compliance action if necessary. (*This action items has been supplanted by the new multi-sector permit which gives marina enforcement jurisdiction to EPA.)*

C. Marinas and Recreational Boating: Pump-Out Facilities

1. Long Term (15 Year) Goal:

By 2029, state waters of Massachusetts will continue to be regulated as an approved No-Discharge Area. Pump-out facilities will be installed and maintained so that one facility exists for every 450 boats with marine sanitary devices.

2. Actions/Implementation Efforts (to 2019):

The following benchmarks and actions are anticipated:

- Contingent on continued Clean Vessel Act Grant Program funding, the DFG-Division of Marine Fisheries grants program will continue to fund purchase, operation and maintenance of pump-out facilities at private new and existing marine facilities, in support of statewide NDA designation. Increased emphasis will be given to supporting operation and maintenance for existing facilities.
- Support the efforts of local harbormasters and state environmental police pursuant to the statewide No discharge Zone (NDZ) designation.
- CZM will continue to maintain the Massachusetts Clean Marina Guide on the CZM website.
- CZM will continue to disseminate boater education brochures via the CZM website to inform the boating public of the need, requirement, and availability of pump-out facilities.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

The boater education brochure and others will be distributed to all Massachusetts' boaters with their registrations. *(This has been achieved.)*

D. Marinas and Recreational Boating: Recreational Boating and Public Education

1. Long Term (15 Year) Goal:

By 2029, education efforts aimed at improvements in recreational boating best management practices will result in advances in the number of vessels equipped with pump-out ready holding tanks (marine sanitary devices).

2. Actions/Implementation Efforts (to 2019):

The following benchmarks and actions are anticipated:

- CZM will continue to disseminate the Massachusetts Clean Marina Guide via the CZM website.
- CZM will continue to disseminate boater education brochures via the CZM website to inform the boating public of the need, requirement, and availability of pump-out facilities.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

- This brochure and others will be distributed to all Massachusetts' boaters with their DFWELE registrations. (This has been achieved, see bullet above regarding future website dissemination)
- Contingent on funding, CZM will work to develop educational signage and provide these signs to marine facilities. (This has been achieved and is now done by towns)
- Contingent on funding, CZM will run workshops targeted towards recreational boaters and boating groups will be organized and held to educate boaters about environmental concerns. (*This has been achieved; funding is not available for continuation.)*
- CZM participates and organizes activities for the National Clean Boating Campaign. (*CZM does not have staff to dedicate to this.)*

AGRICULTURE

1. Long Term (15 Year) Goal:

MDAR, in partnership with NRCS, MACD, and MassDEP, will continue efforts to implement Best Management Practices through Conservation Farm Plans and will continue to provide technical and financial assistance to support the achievement of meeting water quality standards.

2. Actions/Implementation Efforts (to 2019):

The following efforts will be continued in order to build on progress towards achieving water quality goals.

- **Regulatory Certainty Pilot Program:** MDAR is partnering with NRCS, MACD and MassDEP to develop a pilot Regulatory Certainty Program in the Palmer River Watershed. Regulatory certainty is a process which incentivizes the adoption of agricultural conservation practices on farms. Farmers that are implementing site specific conservation practices to address water quality, and who are voluntarily participating in the Regulatory Certainty Program, are presumed to be doing all that they can to comply with water quality mandates.
- **Accelerated Conservation Planning Partnership:** The Accelerated Conservation Planning Partnership is a cooperative initiative among MDAR, NRCS, and the Massachusetts Association of Conservation Districts (MACD). The partnership is intended to accelerate conservation planning and the provision of technical assistance to farmers to address water quality and other resource concerns. Through the partnership NRCS and MDAR, this program jointly funds four conservation planners, a nutrient management planner and support staff throughout the state.
- **Farm Inspections:** MDAR will continue to actively engage small, medium and large animal operations in the state on water quality issues. MDAR staff will continue to conduct farm inspections, make note of technical assistance needed, and provide farm owners with information on funding opportunities.
- **Agricultural Environmental Enhancement Program (AEEP):** Originally started as a fencing program in 1999, AEEP has steadily provided funding to farmers over the past 15 years for implementation of conservation practices to protect water quality. Since 1999, the program has funded 456 projects statewide that improve water quality, conserve water, reduce greenhouse gas emissions, and conserve energy. Agricultural operations have received over $5 million dollars to help them address environmental concerns on their farms. In FY 2013, 31 projects were funded totaling $369,210. For FY 2014, another 30 farms are expected to be funded in the amount of $345,000. This program is expected to continue at a similar level of funding through planning period of 2014-2109.
- **Nutrient Management Planning Legislation:** State legislation requiring planning for the application of all forms of nutrients, including manure, was passed in 2012 (Chapter 262 of the Acts of 2012, An Act Relative to the Regulation of Plant Nutrients). Updated regulations associated with this legislation are expected to be released in 2014.
- **Pesticide Mixing, Loading and Storage Guidelines:** MDAR will continue to promote proper use, handling and storage of agricultural pesticides, consistent with the state guidelines developed in 1998 (viewable online).
- **Pesticide Collection Events:** MDAR will continue to conduct pesticide collection events statewide. Multiple events statewide were coordinated by MDAR with funding through EPA were

conducted through the years 1998 to 2001 (80,000 lbs. collected); 2005 to 2008 (28,322 lbs. and 2640 gallons collected) and 2012 (18,548 lbs. and 1172 gallons collected).

- **Drip and Automated Irrigation Systems:** MDAR will continue to fund the implementation of drip irrigation systems on farms. Since 2008, MDAR has funded over 100 auto-irrigation systems on cranberry farms**.** Auto-irrigation systems are a widely adopted technology in the cranberry sector and have resulted in significant savings in fuel and water use on frost nights and when irrigating.
- **USDA-NRCS Farm Bill Programs:** As described in Section 3.1.8 of the Massachusetts Nonpoint Source Management Plan, Farm Bill programs funded through the United States Department of Agriculture (USDA) - Natural Resources Conservation Service (NRCS) and USDA-Farm Service Agency (FSA) will continue to be important to controlling nonpoint source pollution in the Massachusetts coastal zone and statewide.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

Over the past 14 years (since development of the 2000 CNPCP), there have been significant changes in funding levels and organization of both state and federal agency programs related to agricultural planning and NPS pollution prevention. Significant progress has been made in implementing the actions identified in the 2000 CNPCP for this category. A summary of actions that were achieved is provided below, based on discussions between staff of CZM, MDAR and other program partners:

A. *Agriculture - Farm Planning:* Farm Planning is a continuing and ongoing effort, as described in the summary MDAR and USDA-NRCS program descriptions provided above.

B. *Agriculture - Nutrient Management and Animal Feeding Operation:* MDAR, with support from USDA-NRCS programs, continues to conduct farm inspections which address this sub-category via technical assistance. MDAR also continues to fund related projects to enhance and protect water quality. As described above, new state legislation addressing agricultural nutrient control was passed in 2012 and associated regulations are expected in 2014.

C. *Agriculture - Grazing, Erosion and Sediment Control:* MDAR, with support from USDA-NRCS programs, continues to conduct farm inspections which address this sub-category via technical assistance. MDAR also continues to fund related projects to enhance and protect water quality.

D. *Agriculture - Irrigation:* For this sub-category, MDAR continues to fund and implement drip irrigation systems to address the issues related to improved water management. MDAR reports that they have funded over 100 of these systems.

E. *Agriculture - Pesticide Control Program:* MDAR has funded pesticide container collection and recycling events collection events; has implemented new mixing, loading, and storage guidelines; and continues to implement these guidelines. These new guidelines were developed and implemented in response to the original 6217 planning effort.

F. *Agriculture - Assistance Grants:* Although funding and programs have changed, MDAR continues to work with partners to provide assistance and grants to farmers for environmental improvements as part of their Agricultural Environmental Enhancement Program (AEEP, see description above).

FORESTRY

A. Forestry: Forest Cutting Practice

1. Long Term (15 Year) Goal:

By 2029, through continued implementation of the Forest Cutting Practices Act and its coordination with the Wetlands Protection Program performance standards, and pro-active education on efforts such as forestry BMPs, less than 5% of water resources will be assessed as non-supporting and no wetland enforcement orders will be issued due to forestry operations.

2. Actions/Implementation Efforts (to 2019):

- The MADCR Forest Stewardship Program will continue to provide statewide technical assistance and outreach efforts to the forest cutting community. Although activities of this program are not anticipated within the coastal zone, this program's statewide activities will include coastal zone forestry operations as necessary.
- The MADCR Forest Stewardship Program website will be updated on a continuing basis and will include information on forestry regulations, program information and availability of technical assistance.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

No significant forestry operations have occurred in the Massachusetts coastal zone in recent years and none are anticipated during the planning period of 2014-2019. The statewide program activities of the MADCR Forestry Stewardship Program and the regulatory structure of the Forest Cutting Practices Act have been ongoing and will continue to guide forestry activities in the coastal zone as needed.

HYDROMODIFICATION

A. Hydromodification: Erosion & Sediment Control from Dams, Wetlands Protection Program, Chapter 91 Program, MCZM Dredging Program

1. Long Term (15 Year) Goal:

Continue to implement the Wetlands Protection Program performance standards, Chapter 91 permits and licensing, and 401 Water Quality Certification to prevent or minimize impacts from channelization, stream and coastal bank hardening, and channel dredging. Maximize the opportunities for restoration of coastal and riparian habitat.

2. Actions/Implementation Efforts (to 2019):

- Development of comprehensive Dredged Material Management Guidance document and innovative web site.
- Early resource identification and location through interactive GIS-based marine Resource Characterization tools.
- Continue joint-processing (federal and state agencies) pre-application meetings and guidance for all channel and dredging modification project.
- Federal and state agency personnel technical coordination and education meetings.
- Public meetings and outreach efforts for state Designated Port Areas.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

- Regulatory committee, chaired by DEP, to revise Dredged Material Management regulations (310 CMR 9.00) (*This has been achieved.)*
- Contingent on funding, another round of Riverfront Protection Act workshops will be developed and implemented by DEP. (*This has been achieved; funding is not available for continuation.)*

B. Hydromodification: Erosion & Sediment Control and Dams - Dam Safety Program

1. Long Term (15 Year) Goal:

Continue to implement the DCR Dam Safety Program's erosion control provisions for slopes, embankments, and crests of existing and new dams to prevent these structures from becoming sources of NPS pollution.

2. Actions/Implementation Efforts (to 2019):

- Continue implementation of the state's dam safety law (MGL Chapter 253) licensing provisions and protocols. All projects (new, reconstruction, or repair) require strict erosion and sedimentation controls.
- In-water siltation controls are also mandatory requirements for all projects (new, reconstruction, or repair).
- DCR Dam Safety Program staff inspect existing dams according to the requirements of MGL Chapter 253, which was revised in 2003 to require dam owners to hire engineers to conduct inspections as follows:
    - High Hazard Potential dams - every 2 years;
    - Significant Hazard Potential dams - every 5 years; and
    - Low Hazard Potential dams - every 10 years.
- The revisions Chapter 253 also directed the Dam Safety Program to require, via enforcement, repair or removal of structurally deficient dams in order for owners to bring dams into compliance. The revisions also authorized the Dam Safety Program to conduct enforcement, including assessing fines for non-compliance. Pursuant to the law change, revised regulations were promulgated in November of 2005.

VI. WETLAND RESTORATION AND ASSESSMENT

A. Wetlands Restoration and Assessment: Wetland Restoration Efforts

1. Long Term (15 Year) Goal:

a. By 2019, restore 2,500 acres of Massachusetts's coastal wetlands.
b. By 2019, ecological assessment methodologies for wetlands will be fully developed and utilized by state planning groups, regional non-profits and volunteers, and local officials as an effective tool for identifying wetland sites requiring remediation/restoration, evaluating the

success of restoration projects, inventorying subwatersheds or land holdings, and for piloting wetlands biocriteria.

2. Actions/Implementation Efforts (to 2019):

- By 2019, review and update existing inventories of the entire Massachusetts coastline to identify tidally restricted salt marshes that are feasible to restore (DER with other agencies and groups).
- DER will continue to work with Massachusetts Audubon Society, CZM, ACEC Program, and other partners to implement the Great Marsh Restoration Plan. Activities will focus on restoration of the salt marshes in the Great Marsh, and protection of the Great Marsh from anticipated sea-level rise.
- Continue to identify and support wetland restoration projects under the GROWetlands (Groups Restoring Our Wetlands) Initiative.
- Maintain an active working relationship with our Coastal America partners under the "Resolution to Restore Massachusetts Wetlands" (a Coastal America agreement signed in 1994). Engage federal agencies as partners on specific projects as appropriate. *(Note: Completed and continues)*
- DER will continue to participate in the Massachusetts Corporate Wetlands Restoration Partnership.
- Continue to establish protocols for project monitoring and report results of projects and the program overall.
- In order to increase understanding of restoration project results and the functions of restored wetlands and to improve restoration techniques, we will build working relationships with academic institutions to establish research projects at selected wetland restoration sites. *(Note: Completed and continues)*
- DER will continue to target education and outreach programs to local, state, and federal stakeholders to ensure understanding of and support for wetland restoration.

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

- Complete 10 watershed wetlands restoration plans identifying priority restoration sites in 10 watersheds. This goal was not completed and is not included in the current implementation plan due to lack of staffing resources. One watershed-scale wetland restoration plan is currently being developed by DER.

B. Wetland Assessment

1. Long Term (15 Year) Goal:

By 2029, ecological assessment methodologies for salt marsh wetlands and freshwater herbaceous and shrub marshes will be fully developed and utilized by state planning groups, regional non-profits and volunteers, and local officials as an effective tool for identifying wetland sites requiring remediation/restoration, evaluating the success of restoration projects, inventorying subwatersheds or land holdings, and for piloting wetlands biocriteria.

2. Actions/Implementation Efforts (to 2019):

- CZM will continue to work with MassDEP to develop and refine wetlands assessment tools, including the CAPS (Conservation Assessment and Prioritization System) Model developed in partnership with UMass Amherst. Opportunities to expand the use of CAPS will be evaluated by CZM and MassDEP.
- CZM will continue to work with MassDEP to incorporate wetland condition assessments into routine MassDEP watershed-scale water quality assessments.
- CZM and MassDEP will continue to participate and work with USEPA's New England Biological Assessment of Wetlands Working Group.
- CZM will continue to utilize methodologies to evaluate the trajectory of condition in early wetlands restoration projects. As part of this, CZM will continue to engage volunteers in the use and application of wetland assessment methodologies.
- CZM will continue to participate in USEPA's New England Biological Assessment of Wetlands Workgroup.
- CZM staff will present papers and give presentations on wetland assessment as necessary/requested

Actions from 2000 CNPCP that have been achieved and/or will not continue in 2014-2019

- Continue work on EPA Region I Pilot: Cape Cod Bay Salt Marsh Assessment Project to refine methodologies for salt marshes degraded by proximate land use and tidal restrictions. Indicators include aquatic macro-invertebrates, vegetation, avifauna, fish, pore and surface water chemistry, and hydrology. *(This has been achieved.)*

- Develop and test indicator protocol for fish or nekton for addition as a viable and effective component of the salt marsh assessment toolbox. *(This has been achieved.)*
- Through the North Shore Volunteer Wetland Health Project, continue to refine the volunteer training modules and handbook. *(This has been achieved.)*

VI ATTORNEY GENERAL'S CERTIFICATION

I hereby certify, pursuant to my authority as the chief legal officer of the Commonwealth of Massachusetts, that in my opinion, the laws of the Commonwealth of Massachusetts provide adequate authority for the Department of Environmental Quality Engineering to implement the Massachusetts Nonpoint Source Management Program, submitted to the United States Environmental Protection Agency pursuant to the 1987 amendments to the Clean Water Act, 33 U.S.C. § 319.

The following state statutes or regulations, which are fully effective as of this date, provide the legal authority for implementation of the Massachusetts Nonpoint Source Management Program:

1. In General: G.L. c. 21, § 27 (duties and responsibilities of the Division of Water Pollution Control within the Department of Environmental Quality Engineering;

2. Silviculture: G.L. c. 132, §§ 40-46 and 304 C.M.R. 11.00 concerning forest cutting practices;

3. Construction: G.L. c. 131, § 40 (Wetlands Protection Act); G.L. c. 41, §§ 81K-81GG (the Subdivision Control Law);

4. Land disposal: G.L. c. 111, §§ 150A, 150A 1/2 (1987 Solid Waste Act); 310 C.M.R. 19.00 (regulations concerning landfills); 310 C.M.R. 32.00 (regulations concerning the land application of sludge and septage).

In addition, the program recommends enactment/promulgation of additional authorities:

1. Establishment of a soil erosion and sedimentation control law. A proposed bill is currently pending in the legislature.

2. Amendments to the subdivision control law, G.L. c. 41, §§ 81K - 81GG, to address stormwater runoff and

nonpoint source controls. Review and proposals for amendments are scheduled to be accomplished one year after approval of the final plan; legislation would be filed within two years of approval;

3. Amendment of G.L. c. 90 to require that prior to commencement of any local road work using Chapter 90 funds, the local road/highway authority must have a nonpoint source stormwater management plan approved by the local Coservation Commission. Action on this is scheduled to be complete by the end of the third year following approval.

4. Pesticides: Under current G.L. c. 132B, expansion of the State Limited Use category to include a provision for Drinking Water Protection. No schedule has been developed as this is currently only a draft recommendation.

5. Enactment of legislation to create a state nonpoint source pollution control program. Legislation filed in 1988 proposed grants to public entities to conduct diagnostic/feasibility studies and implementation projects. Also, the proposed bill would allow the state to match any available funds from § 319 of the federal Clean Water Act.

6. Possible revisions to Title 5 (310 C.M.R. 15.00, regulations concerning the disposal of sanitary sewage). Review and revision is scheduled for completion by the end of the second year following approval.

Based on my evaluation of existing authority, I hereby certify that the Department of Environmental Quality Engineering has the authority to implement the provisions of the Nonpoint Source Management Plan.

James M. Shannon
Attorney General
Commonwealth of Massachusetts

May 17, 1989
Date