Watershed Planning

For the Protection and Restoration of Clean Water and Healthy Aquatic Habitats

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February 10, 2021

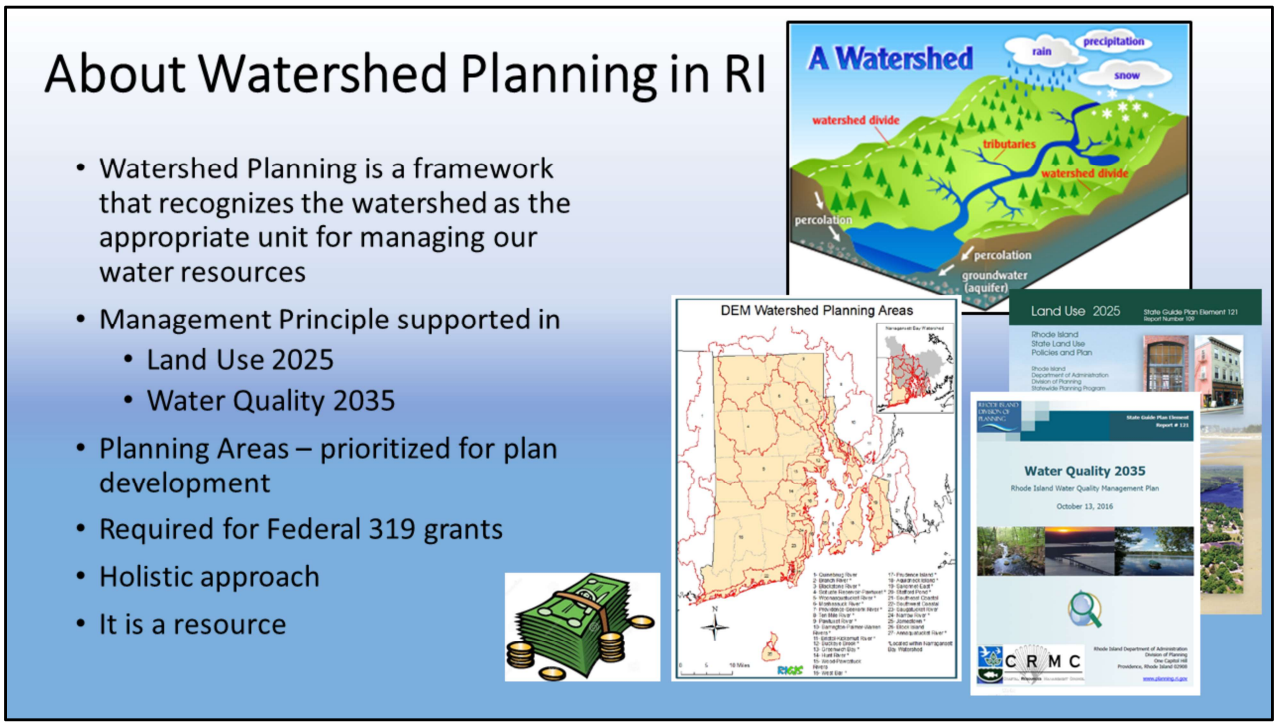
Hi Everyone! I am Jenny Paquet, an environmental planner with DEM in the Office of Water Resources. I work for the Nonpoint Source Pollution Management Program.

NPS pollution means pollution that comes from many diffuse sources vs. pollution that discharges out the end of a pipe.

I am working on watershed plans for various watersheds in Rhode Island. These plans are for both the protection and the restoration of clean water and healthy aquatic habitats within an entire watershed.

This map on the lower left shows an aerial image of the Buckeye Brook Watershed as an example of a watershed in Rhode Island.

The figure on top represents a watershed. I like this figure because it shows land uses in the watershed, and land use management has a lot to do with the resulting quality of the water resources in a watershed.



This is some context to explain Why we are doing watershed plans.

Watershed Planning is based on a Framework that recognizes the Watershed as the appropriate unit for managing our water resources.

What happens upstream affects downstream, (which could be in a different town or State) and what happens on the land can affect the water, the groundwater, and the aquatic habitats in that watershed.
And watershed planning is a way to look at all these connections.

In Rhode Island, land use is managed on the municipal level, however, watershed boundaries transcend political boundaries so watershed management involves coordinating across these areas of shared water resources—not just with municipalities, but with all the stakeholders in a watershed who have a role in providing information or taking actions in a watershed, including watershed organizations, etc.

This Management Principle is supported in our State Guide Plans for Land Use and Water Quality, and the Water Quality 2035 Plan has a goal to develop these Watershed Plans.

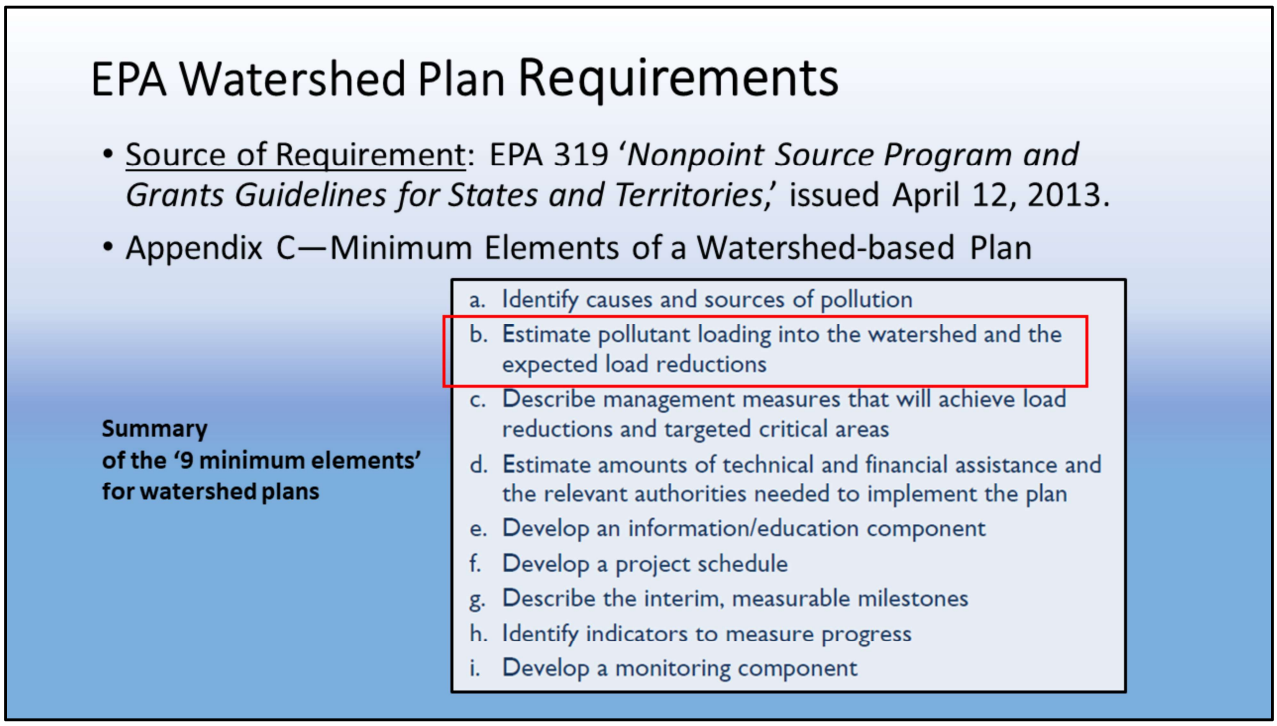
And we are Prioritizing: Our NPS Program Management Plan includes a list of priorities,

but this is not stopping anyone interested from developing a watershed plan for their area of interest. There just is no money available to develop these plans.

Besides being a good idea for management purposes, a Watershed Plan is now required for projects to be eligible for Federal 319 grants. This is the program I work for.
This is federal funding provided by the USEPA under Section 319 of the Clean Water Act, which RIDEM administers for grants for nonpoint source water pollution projects and aquatic habitat restoration projects.

These watershed plans take a holistic approach, and attempt to address all sources and potential sources of pollution and threats to aquatic habitat, and then they also integrate the **full range of actions—from regulatory to voluntary—** to protect and restore water resources. And they include all sources of water pollution, not just nonpoint pollution.

These plans are not required to be adopted by any of the municipalities. It is simply meant to be a resource for prioritizing issues and actions; and to be used as a supporting document when applying for grants; but it should also be valuable for anyone wanting to know what has been done or ideas for what you might want to consider for what could be done. So it is meant to be a resource.

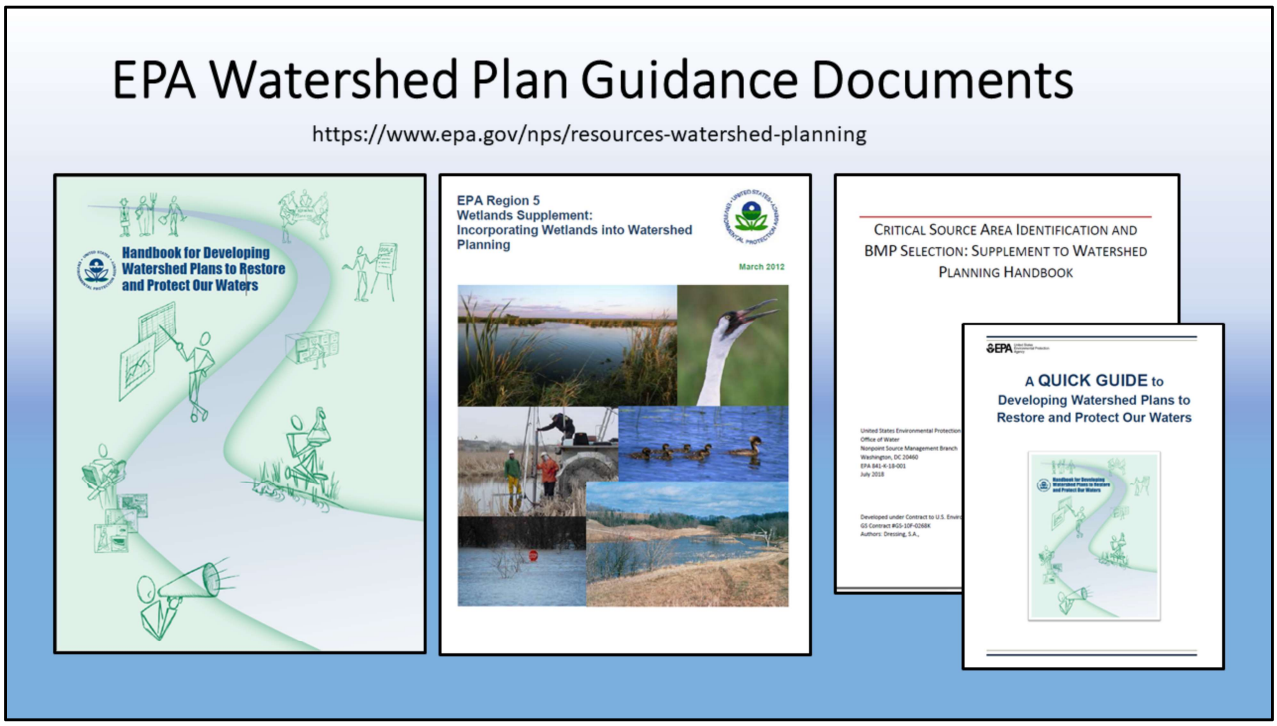


Like I mentioned, a watershed plan is required for a potential project to be eligible for NPS 319 grant funds.

This is the origin of that requirement, written into the 319 Grant Guidance document effective 2014.

Appendix C of this document goes into depth on the requirements for what a watershed plan is to include.

You'll see item b. is to estimate pollutant loading amounts and load reductions needed. For this item, we rely on TMDLs, which are studies that measure and calculate these quantities. I'll talk about TMDLs more later.



For anyone interested in learning more or for information on how to develop a watershed plan, here are some guidance documents from EPA and a link to where you can find them.

https://www.epa.gov/nps/resources-watershed-planning
(copy and paste into address bar)

You can also contact me or Ernie and we can set you up with an outline and point you to some resources specific for your watershed that would be useful to incorporate into your planning.

The Handbook on the left can be overwhelming, so I would direct you to the Quick Guide that was developed.

RI Watershed Plan Vision

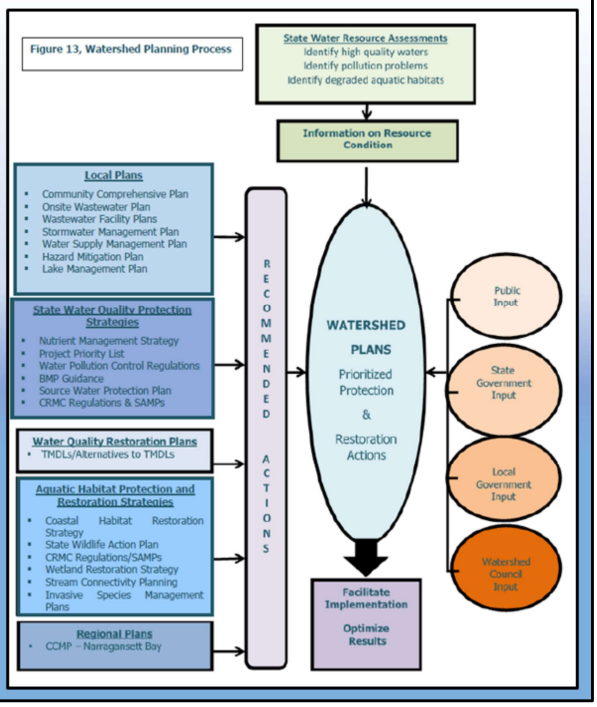
- NPS Program Management Plan
- SGP Water Quality 2035

"A watershed plan serves as a mechanism to integrate the **full range of actions** recommended for **protecting** and **restoring** water quality and aquatic habitat within a given watershed."

"Plans can be developed for all of a watershed planning area or a portion of that watershed, i.e., a sub-watershed."

RI's framework for managing water quality:

1. Monitoring
2. Assessment
3. Planning (Watershed Plans, TMDLs, etc.)
4. Implement plans and strategies
5. Evaluate results

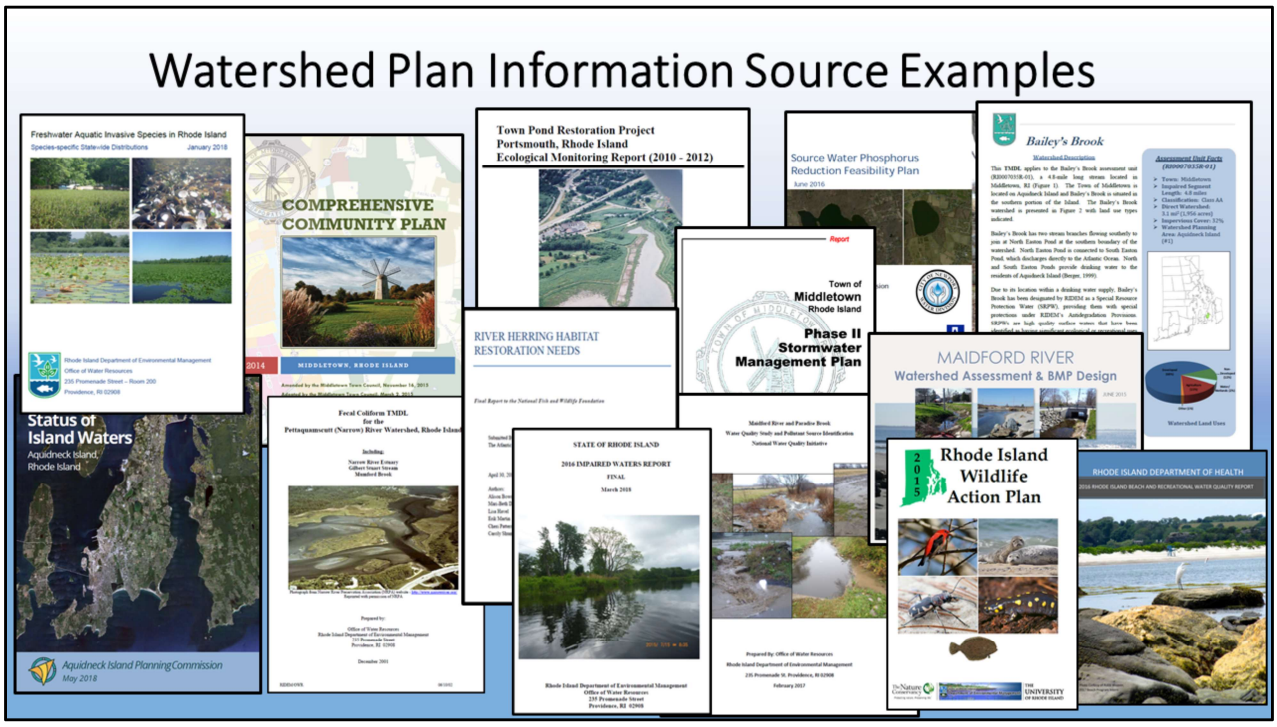


This is how RI's watershed plans differ from the 319 guidance:

- we intend them to be more encompassing than just nonpoint source pollution
- EPA's requirements emphasize pollutant loading reductions, which are for Impaired Waters, however, DEM envisions watershed plans to 'also identify protection actions needed to prevent degradation of water quality and aquatic habitats. So, protection is equally important as restoration. This is a primary goal of State Guide Plan for Water Quality 2035.

Watershed Planning is a key component of the State's Water Quality Management Framework, which involves monitoring water quality and aquatic habitat conditions, assessing those conditions, planning strategies to protect or restore conditions, implementing those strategies, and evaluating the results of the strategies. The State's Framework and the EPA requirements both **rely on science** (this is where the data from your volunteer water quality monitoring programs can come into play) and a classic planning methodology.

As you can see from the diagram taken from SGP Water Quality 2035, Watershed Planning is meant to incorporate various sources of available information in order to inform these plans, and then to take the information and share it with others and figure out **priorities** and what else is needed to either protect or restore the water resources in that watershed.



What goes into the Watershed Plans? Other than if a TMDL is in the works, we are not doing any new research.

We've been compiling the relevant information from all the various existing plans and studies that pertain to a particular watershed, and attempting to document some of the major work that has already been done. This helps us identify gaps and prioritize actions for moving forward.

We also check with key stakeholders to find out what they think the issues and priorities are, and what they think needs to be done. Then we suggest supplemental recommendations to help fill in any gaps.

This slide shows some examples of the sources of information that are pulled together for watershed plans.
So documents like the State's List of Impaired Waters, the Department of Health's Beach closure data, Total Maximum Daily Load Studies, local MS4 Stormwater Management Program Plans, Community Comprehensive Plans, State plans for Invasive Species, Habitat restoration, etc.

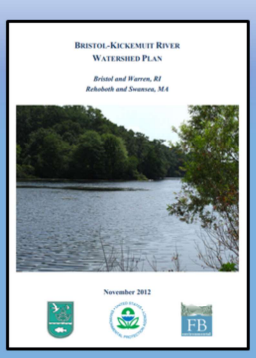
The idea is to take a step back and look at the big picture to prioritize issues and actions for

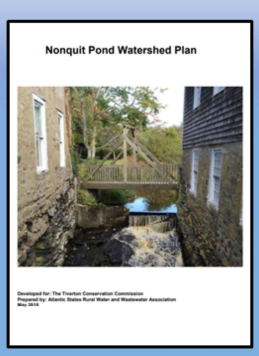
moving forward with the limited financial resources available.

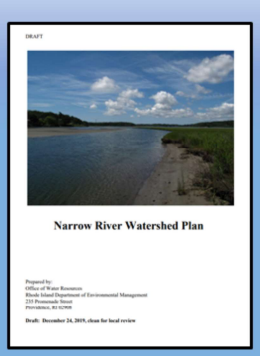
It helps to have a grasp on the big picture. And they are a way to integrate information from the various plans into one plan for a unified view.

Watershed Plans in Rhode Island

- Completed/EPA approved: Bristol-Kickemuit River, Barrington-Palmer-Warren Rivers, Narrow River, Nonquit Pond
- Draft under EPA review: Wood-Pawcatuck River
- In Development: Aquidneck Island, Scituate Reservoir, Stafford Pond







These are the plans that have been completed and approved by EPA. We have one draft plan currently under EPA review, and a few more are being developed now.

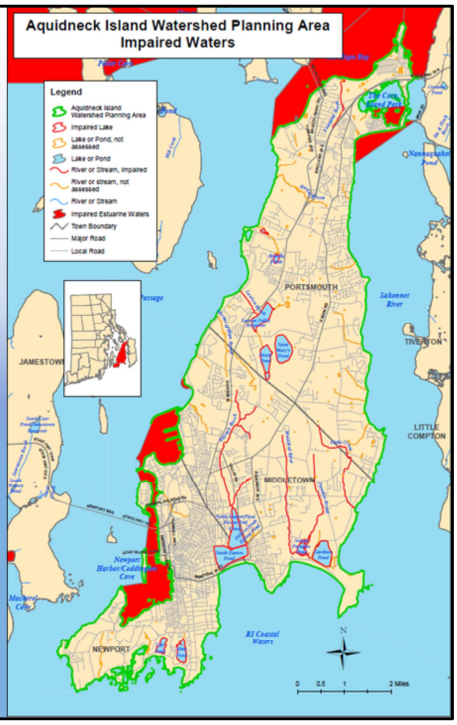
Impaired Waterbodies Map

Waterbodies with pollutants causing one or more impaired use in red

Waterbodies not assessed in orange

"Impaired" – waterbody does not meet the water quality standard for one or more of its 'designated' uses.

DEM develops 'Water Quality Restoration Plan,' aka 'TMDL' for waterbodies on 303d list.



As an example of what you can find in all watershed plans-the current status of all the waterbodies.

This is a map showing the waterbodies on Aquidneck Island that are currently listed as impaired for certain uses on our official List of Impaired Waters- (or called the '303d list,' ref. Clean Water Act)

Red are impaired, and the waterbodies in orange have not been assessed.

You'll see that this map includes freshwater and coastal waters.

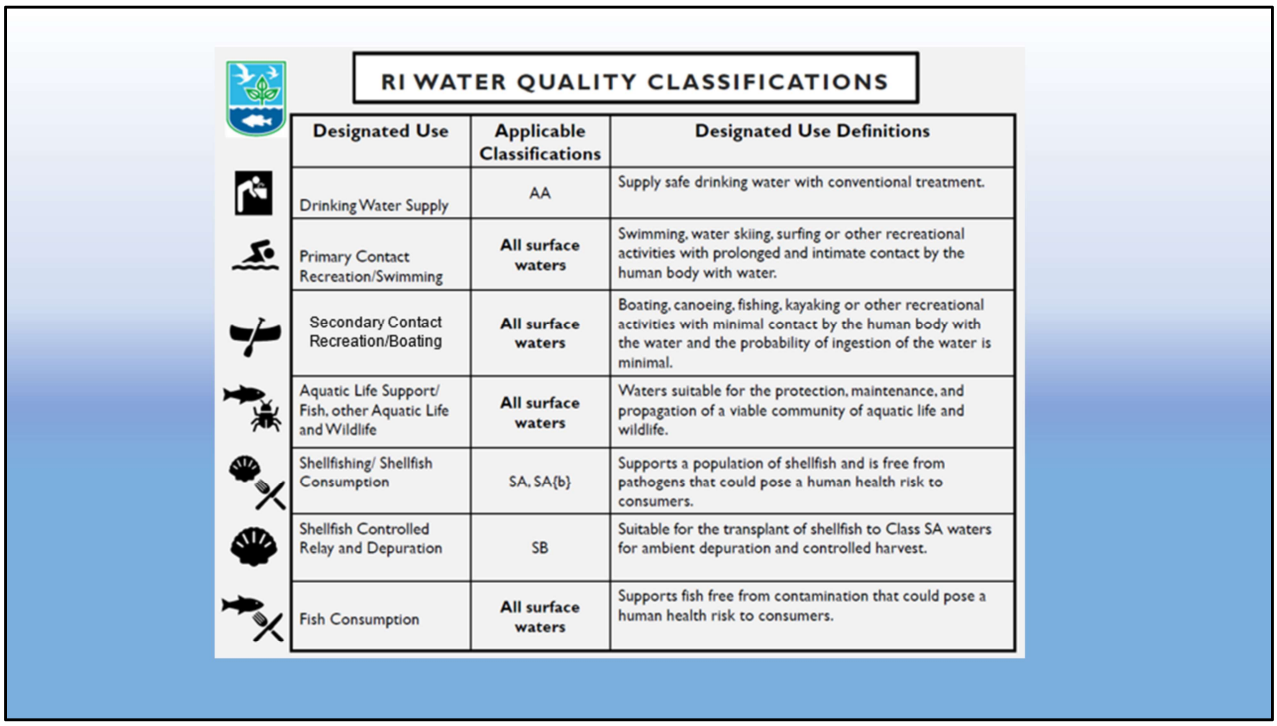
Watershed plans give a status on each of the waterbodies within that watershed, and notes whether they have been assessed or not, and if so, what do we know.

"Impaired" means it doesn't meet the water quality standard for one or more of its intended, or 'designated,' uses.

Once a waterbody is put on this list, DEM is required to create a specific plan to restore that water quality. This is called a 'Water Quality Restoration Plan' which includes that Total Maximum Daily Load calculation/ analysis (TMDL).

And those TMDL's involve some regulatory and some voluntary means for reducing the pollution to that waterbody, depending on what's applicable.

So now I am going to talk a bit about TMDL's, but first….



RI WATER QUALITY CLASSIFICATIONS

Designated Use	Applicable Classifications	Designated Use Definitions
Drinking Water Supply	AA	Supply safe drinking water with conventional treatment.
Primary Contact Recreation/Swimming	**All surface waters**	Swimming, water skiing, surfing or other recreational activities with prolonged and intimate contact by the human body with water.
Secondary Contact Recreation/Boating	**All surface waters**	Boating, canoeing, fishing, kayaking or other recreational activities with minimal contact by the human body with the water and the probability of ingestion of the water is minimal.
Aquatic Life Support/ Fish, other Aquatic Life and Wildlife	**All surface waters**	Waters suitable for the protection, maintenance, and propagation of a viable community of aquatic life and wildlife.
Shellfishing/ Shellfish Consumption	SA, SA{b}	Supports a population of shellfish and is free from pathogens that could pose a human health risk to consumers.
Shellfish Controlled Relay and Depuration	SB	Suitable for the transplant of shellfish to Class SA waters for ambient depuration and controlled harvest.
Fish Consumption	**All surface waters**	Supports fish free from contamination that could pose a human health risk to consumers.

What do I mean when I say, “Designated Uses?”

The State Water Quality Regulations has assigned designated uses to every waterbody in the State through the use of a classification system.

So, for a waterbody classified ‘AA,’ it has a designated use of ‘drinking water supply.’ The water quality should be such that it can be safe to drink using conventional treatment.

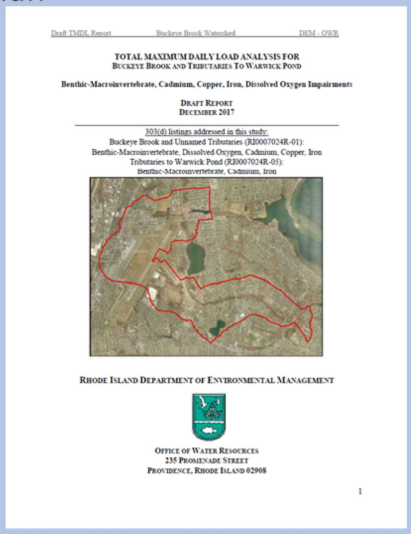
In Rhode Island, all surface waters should have water quality that can support primary and secondary contact recreation, fish and wildlife habitat, and fish consumption.

So these designated uses then dictate the water quality standard that the waterbody should be meeting.

‘Water Quality Restoration Plan’

a.k.a, TMDL (Total Maximum Daily Load) Study or Plan

- **TMDL:** The amount of a pollutant a waterbody can assimilate and still meet water quality standards.
- **Federally Mandated Study**
- Goal: to **restore** the waterbody’s designated use (swimming, drinking, edible fish, wildlife habitat)
- Reduction needed, or “allowable amount,” forms the basis for Regulatory Action
- For Waterbody on the “List of Impaired Waterbodies” (aka 303(d) list)
- In RI, Water Quality Restoration Plans: include required and recommended corrective actions


Draft TMDL Report Buckeye Brook Watershed DEM - OWR

TOTAL MAXIMUM DAILY LOAD ANALYSIS FOR
BUCKEYE BROOK AND TRIBUTARIES TO WARWICK POND

Benthic-Macroinvertebrate, Cadmium, Copper, Iron, Dissolved Oxygen Impairments

DRAFT REPORT
DECEMBER 2017

303(d) listings addressed in this study:
Buckeye Brook and Unnamed Tributaries (RI0007024R-01):
Benthic-Macroinvertebrate, Dissolved Oxygen, Cadmium, Copper, Iron
Tributaries to Warwick Pond (RI0007024R-05):
Benthic-Macroinvertebrate, Cadmium, Iron

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

OFFICE OF WATER RESOURCES
235 PROMENADE STREET
PROVIDENCE, RHODE ISLAND 02908

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Ok, so I’ve talked a little bit about Watershed Planning. I’m going to talk a little bit about this other type of plan called a ‘Water Quality Restoration Plan’ which is also referred to as a ‘TMDL.’

TMDL stands for Total Maximum Daily Load. Which is “the amount of a pollutant a waterbody can take in and still meet its water quality standards.”

- It is a Federally Mandated study (and it is rather technical)
- The Study Determines that Total Maximum Daily Load- the amount of a specific pollutant that can be discharged into a specific waterbody and still maintain the water quality standard for that waterbody.
- and this ‘limit’ or “allowable amount” forms the basis for Regulatory Action. This regulatory action is limited to the relevant RIPDES permits in the watershed. I am not going to go over that in this presentation.
- The Goal is to Restore the waterbody’s designated use that is currently impaired, hence, ‘restoration plan.’ It is different than a Watershed Plan, but can be confusing because it kind of sounds the same.
- The contributing sources of that pollutant need to be reduced by some amount—this is the other number that is calculated, usually a percent of the load reduction needed (remember item b from the requirements for a watershed plan- if a TMDL exists, this is a

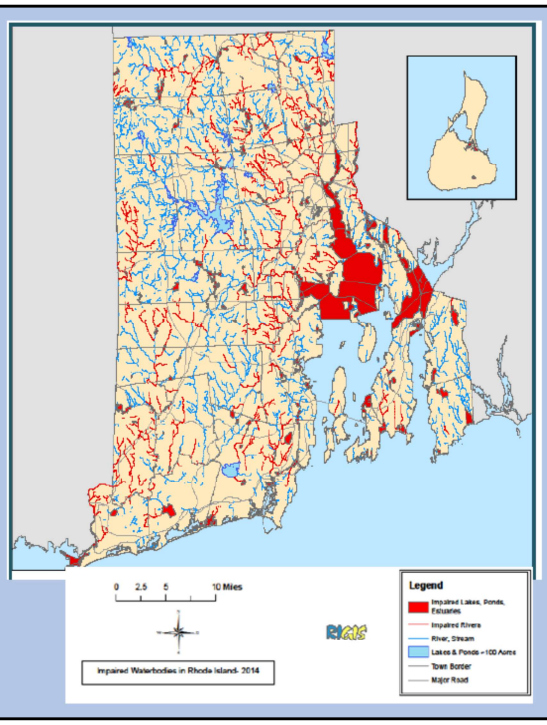
handy way to fulfil that requirement).

But, why is it called a Water Quality Restoration Plan?

- In Rhode Island, usually the TMDL calculation study also includes a**ction items and recommendations** that are needed to be implemented to work towards the goal to achieve acceptable levels for the water quality to improve. So this is the Water Quality Restoration Plan.

WQ Restoration Plan (TMDL) vs. Watershed Plan

- TMDL for impaired water on the 303 (d) list (CWA)
- Watershed Plan can be for protecting clean water--no need to have impaired water to do a watershed plan
- Watershed Plan for aquatic habitat
- TMDL for specific pollutants
- Watershed Plan address all the known and potential sources of water pollution and stressors on aquatic habitat
- TMDL is a key element of a Watershed Plan



What are some differences between a Water Quality Restoration Plan (or, TMDL) and a Watershed Plan?

A TMDL is created for an impaired waterbody that is on the State's List of Impaired Waters. So it has to be on that list. This is for surface water only, not groundwater.

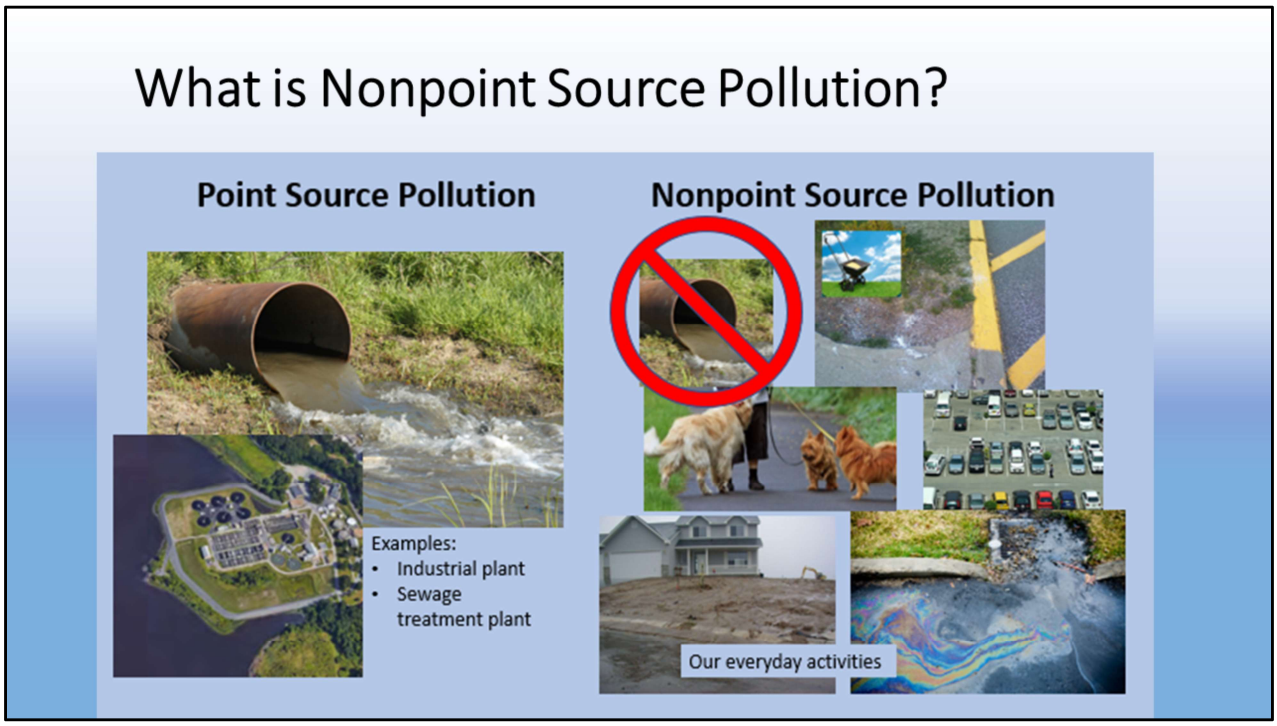
Watershed Plans can include protecting clean water, including groundwater, there is no need to have a polluted waterbody to do a watershed plan.

And Watershed Plans can address Aquatic Habitat, which I will talk about shortly.

TMDL's address a specific pollutant(s), not necessarily all the pollutants, or all the water related issues in the watershed (i.e., flooding, or aquatic habitat).

Whereas Watershed Plans address all the known and potential sources of water pollution and stressors on aquatic habitat in the watershed, including wetlands and buffer loss, and some other types of things I will introduce later.

So, a TMDL can form a key part of a Watershed Plan.



A little bit more about nonpoint source pollution:

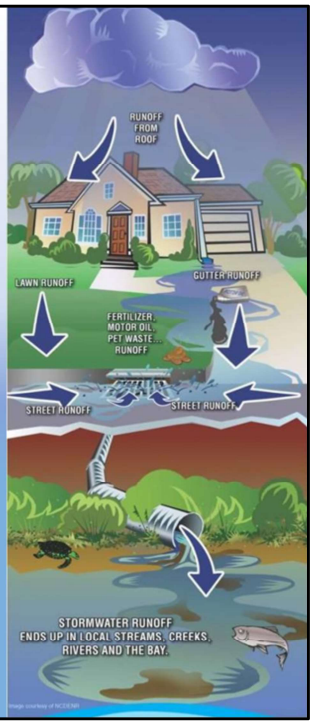
Pollution that comes from many diffuse sources. It is from our everyday activities. This is hard to regulate. It is easy to regulate pollution coming out of a pipe because you know what it is from and you know who is responsible.

For nonpoint source pollution, because it is so hard to regulate, we rely on other methods to combat it. One example is public education—spreading awareness– is really important, because this is stuff individual people have personal control over. So public education is an important action item included in watershed plans. Another strategy for addressing nonpoint source pollution is providing 319 grants to eligible entities- who then voluntarily apply for the funding to do a nice project that tackles this problem. Of course you need to have a watershed plan first.

Watershed plans also talk about point sources. As an example, Aquidneck Island has had wastewater discharges from combined sewer overflows into coastal waters. So things that are going on with sewer and wastewater management as relevant to a watershed, are discussed in the plan for that watershed.

What is Nonpoint Source Pollution?

- The **major source** of water quality problems
- **numerous and diffuse** sources of pollution that are distributed across the landscape that **cumulatively contribute** to degraded water quality conditions in our waterbodies and aquatic habitats.
- Mostly in **Stormwater Runoff**
- In "urbanized areas," once in a storm drainage pipe system, it is considered a Point Source and is regulated under the RIPDES MS4 Stormwater Program.



This slide is to segue for talking about the MS4 Stormwater Program.

So, here are some points I want to make about NPS pollution:

- It is a Major source of water quality problems in Rhode Island. Nutrients and pathogens, but also sediment, are the most prevalent problems in RI.

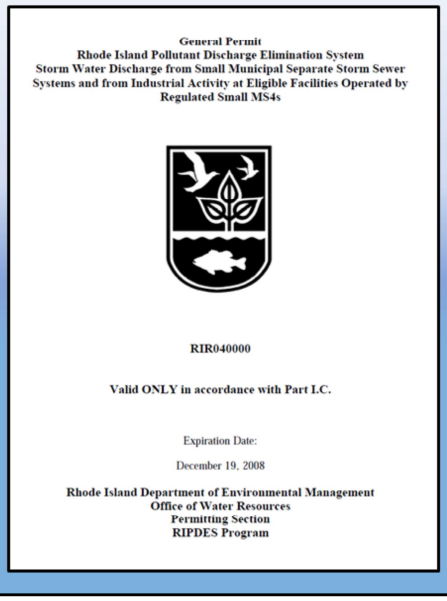
- A little bit here from a failed septic system and a little bit there from someone's dog really adds up. It is a cumulative impact that results in noticeable degradation of water quality conditions in our waterbodies and aquatic habitats.

- It is mostly carried in stormwater runoff to our waterbodies.

- Not to be confusing, but once that polluted runoff goes into a storm drainage system **in an urbanized area which has to do with census population**—it then becomes a point source and is regulated through the RIPDES MS4 Stormwater program.

- RIPDES is Rhode Island Pollutant Discharge Elimination System
- MS4 stands for 'Municipal Separate Storm Sewer System.' I will talk about this next.

RIDEM 'RIPDES MS4 Stormwater General Permit'



General Permit
Rhode Island Pollutant Discharge Elimination System
Storm Water Discharge from Small Municipal Separate Storm Sewer Systems and from Industrial Activity at Eligible Facilities Operated by Regulated Small MS4s

RIR040000

Valid ONLY in accordance with Part I.C.

Expiration Date:

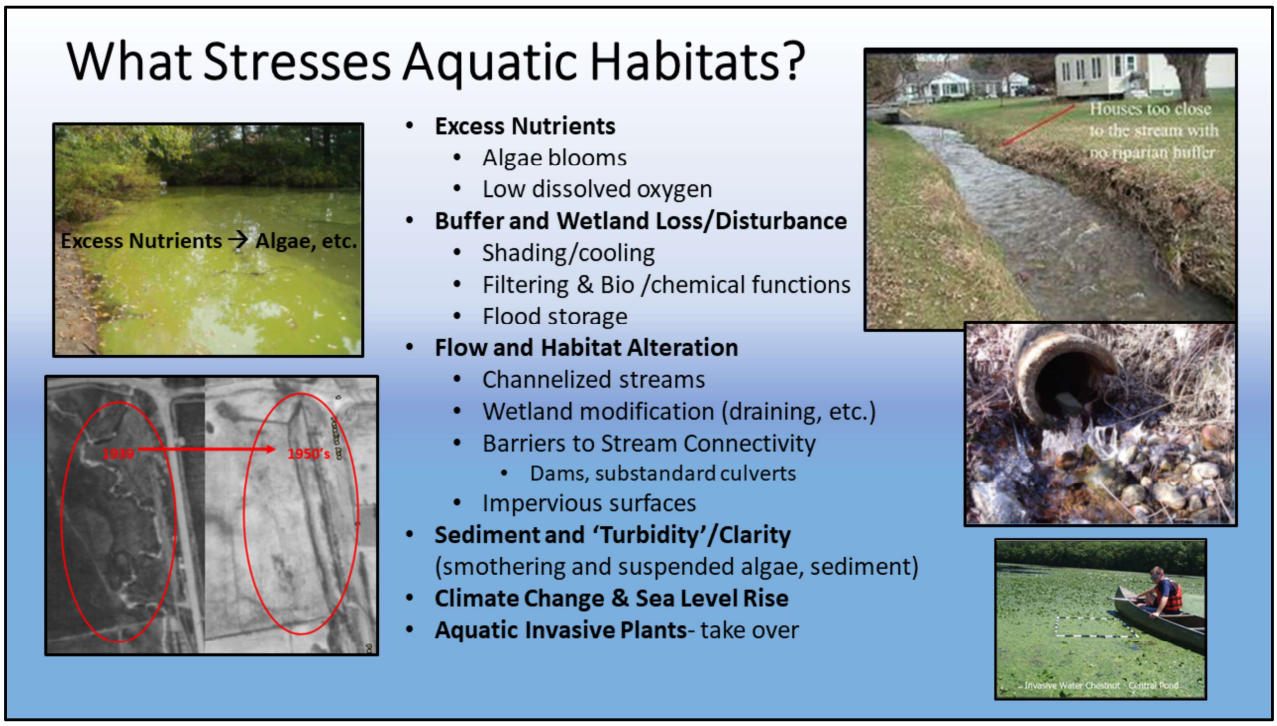
December 19, 2008

Rhode Island Department of Environmental Management
Office of Water Resources
Permitting Section
RIPDES Program

- Federal Requirement for Stormwater Discharges
- 34 cities & towns (all or portions of), RIDOT, etc.
- Annual Reporting requirement: due March 10th
- Local Stormwater Management Program Plan
- 6 'Minimum Measures,' plus TMDL (if stormwater) and SRPW
  - Public education and outreach (NPS stuff!!)
  - Public involvement and participation
  - Illicit discharge detection and elimination
  - Construction site runoff and pollution
  - Post-construction stormwater runoff management
  - Municipal pollution prevention/ good housekeeping

Most areas of most municipalities are required to comply with this General Permit. They are required to have a Stormwater Management Program Plan (SWMPP) and run a local program for this and report to DEM on their progress and compliance every year in March.

The local Stormwater Management Program is required to include these 6 'minimum measures' and also address any Special Resource Protection Waters (SRPW, as specified in the State Water Quality Regulations) that may be in the MS4 regardless of whether it is in the 'urbanized' area, and also they are required to address TMDLs that have identified stormwater as the cause of an impairment.



So by now, you've heard about a bit about watershed planning, TMDLs and the MS4 Stormwater Program, now I'm going to talk about some other stuff that Watershed Plans include:

Watershed plans also discuss factors and conditions that can negatively affect the quality of the aquatic habitats in a watershed. And a lot of times things that affect habitat also affect water quality and/or flooding. So it is all related, and watershed plans look at these connections and interrelated issues, depending on what is applicable for that watershed.

Watershed plans go over how to prevent these things from happening, and also actions to take to undo some of these existing problems.
And measures that address these stressors will help restore and protect aquatic habitats, and can have a lot of other co-benefits, including building resiliency to climate change. This concept is not lost on a watershed plan– it is integrated within a watershed plan.

So the take-away here is that watershed plans cover protection and restoration for both water quality and aquatic habitats, and they take into consideration climate change and resiliency, and look at these interrelated issues more holistically than just a TMDL or just an

MS4 program. It is all connected.

Thank you!

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