



# Development of the Water Quality Management Element of the State Guide Plan



**State Planning Council Presentation**

**Susan Kiernan**  
**Deputy Chief, Office of Water Resources**  
**RI Dept. of Environmental Management**  
**December 12, 2013**



# Purpose of the Water Quality Management Plan

- **Protect and restore water quality**
- Update and integrate prior plans into a single SGP element that comprehensively describes policies and recommended actions needed to advance progress toward water quality goals.
- Will help RIDEM fulfill its obligations to EPA to update the state plan for non-point source pollution in order to retain certain funding.



# Purposes of SGP Updates

- Part of larger DOP effort to streamline the SGP:
  - Make the SGP easier to use and understand.
  - Reduce redundancy of goals and policies.
  - Reduce total number of SGP elements by consolidating similar topics.
  - Repeal outdated elements –
    - 162 - Rivers Plan (2004)
    - 715 - CCMP (1992)
    - 731 – Nonpoint Source Management Plan (1995)



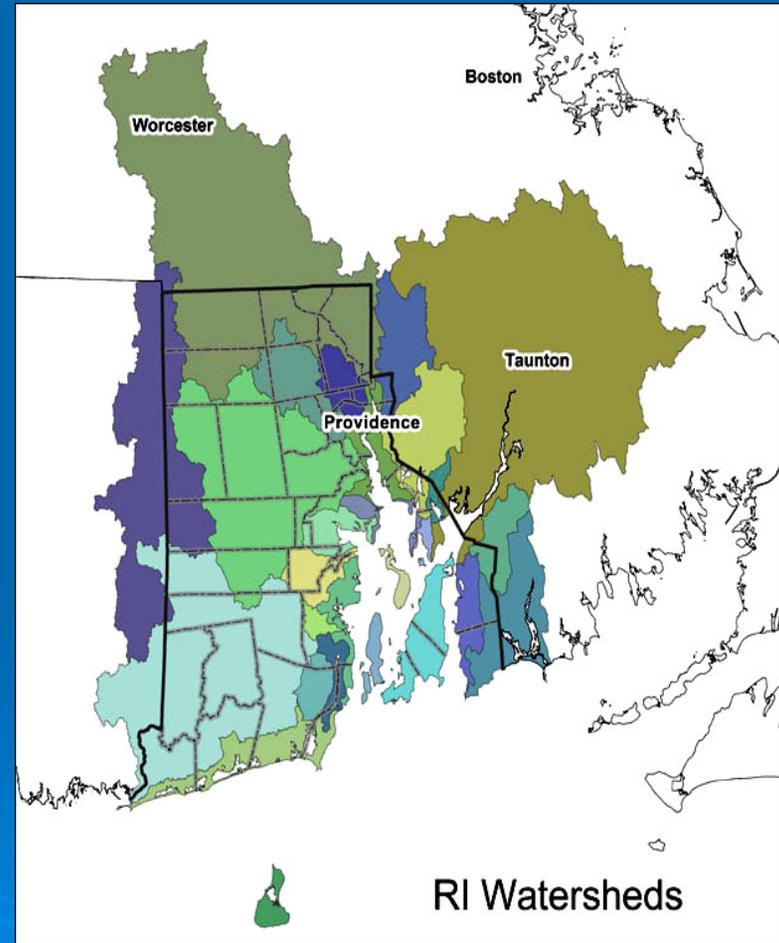
# Alignment with other SGP Elements

- Will not be duplicative.
- Expect to cross-reference and reinforce policies and actions already reflected in:
  - Land Use 2025
  - Water 2030
- Opportunity to draw from, build on and integrate related planning efforts into a statewide plan for water quality management:
  - Update to the Comprehensive Conservation Management Plan for Narragansett Bay (2012)
  - Clean Water Needs Survey (2012)
  - Systems Level Plan – BRWCT (2008)



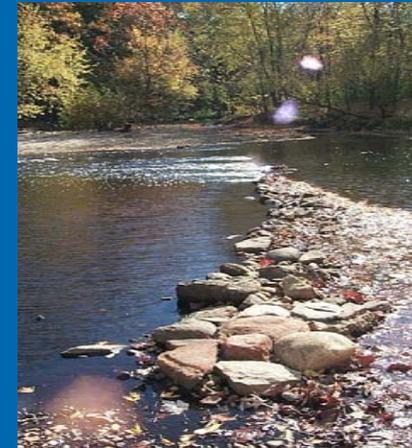
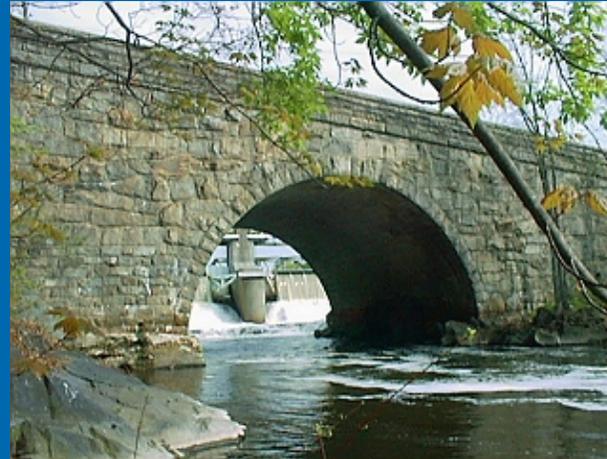
# Plan will provide a framework for effective watershed management

- Rhode Island can be divided into over 20 watersheds.
- Larger watersheds can be subdivided into smaller sub-watersheds.
- Watersheds cross town and state boundaries.
- About 60% of the watershed for Narragansett Bay lies in Massachusetts.

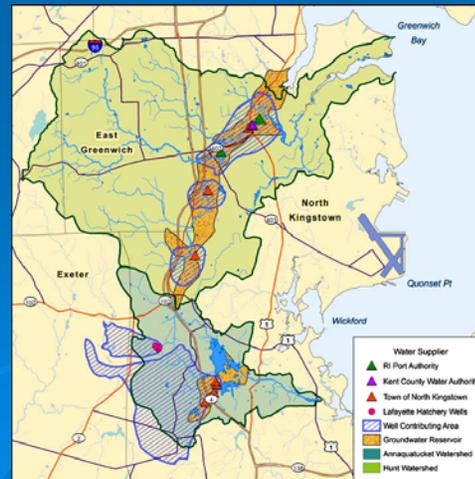




# Scope of the Plan - Statewide



**Coastal waters - Rivers - Streams- Lakes- Ponds- Groundwater - Wetlands**





# Monitoring yields information on the condition of our water resources

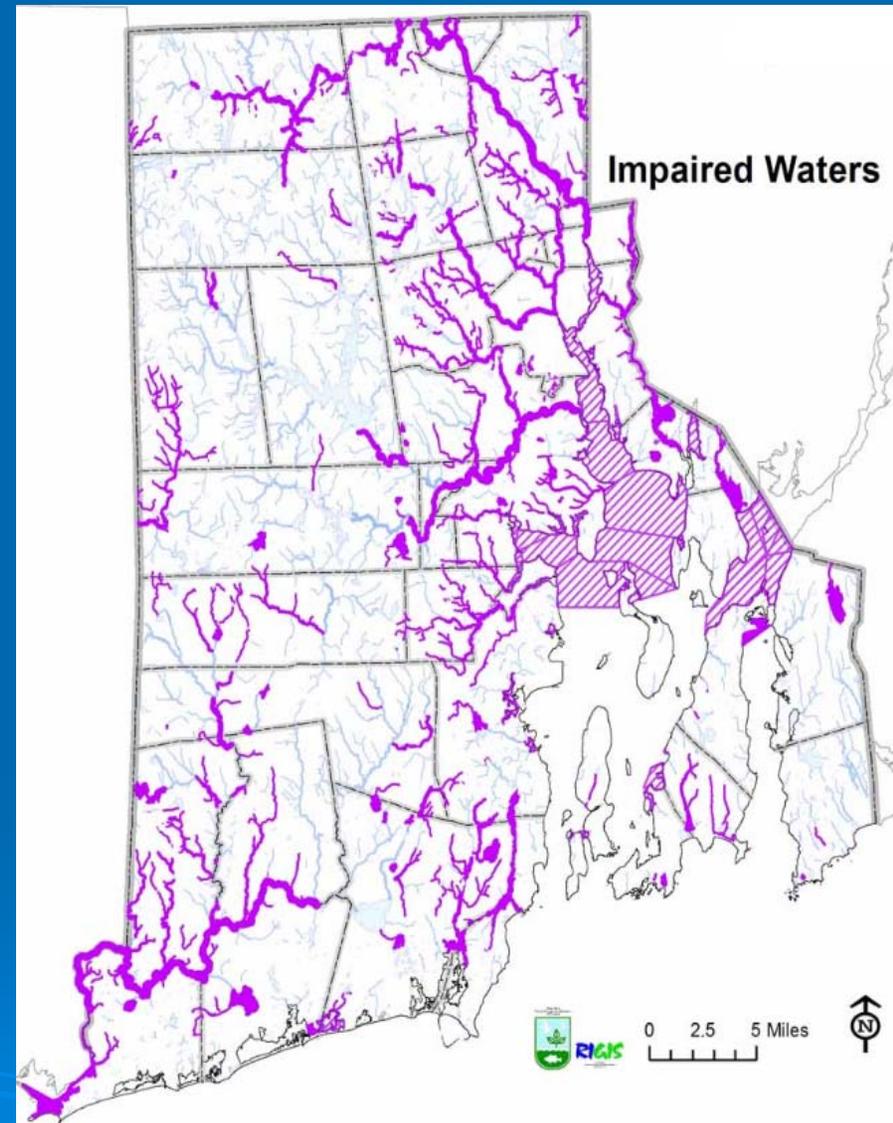
- Surface waters are periodically assessed by comparing data to water quality standards (federally required)
- Assessment of groundwater and wetland resources is less extensive
- Data gaps exist





## Surface waters **not** meeting water quality standards

- **38.8%** of 1,420 river total miles; 60% of river miles assessed;
- **41%** of 20,749 total lake acres; 55% of acres assessed;
- **35%** of 159 sq mi of estuarine waters.

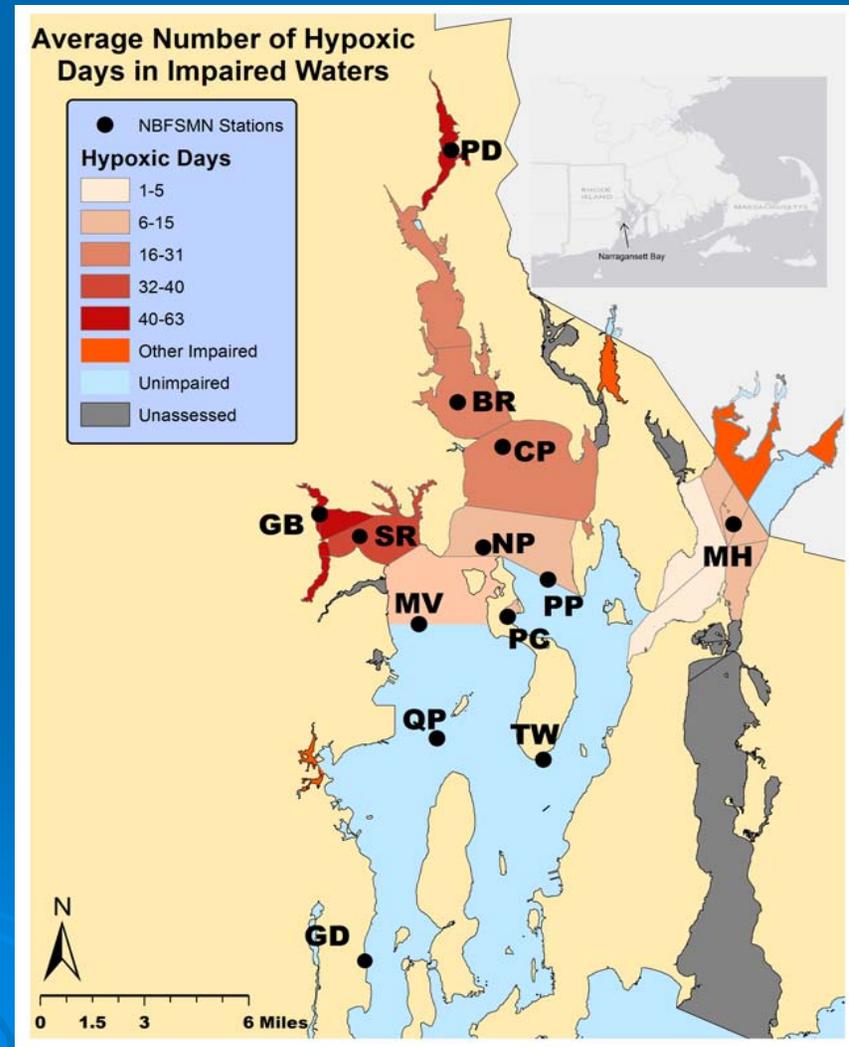


Source: 2012 Integrated Report, RIDEM



# Nutrient Enrichment in Estuarine Waters

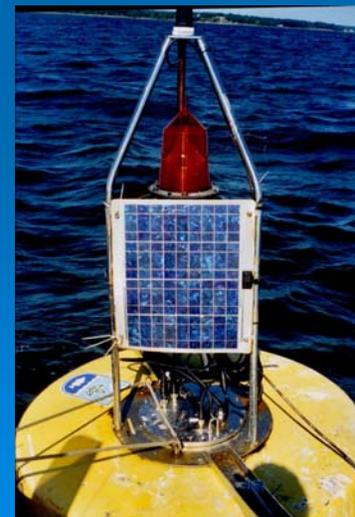
- About 1/3 of Narragansett Bay experiences low dissolved oxygen.
- Not all areas of the bay are equally affected.
- Largest source of N to upper bay: wastewater treatment facilities.





# A Changing Bay: Implementing Nutrient Reductions at WWTFs to Restore Water Quality

- 11 RI Wastewater Treatment Facilities are investing over \$275 million to reduce pollutant loadings of **nitrogen** to the upper Bay and its tributaries;
- 6 of 11 RI WWTFs upgrades are fully completed; 4 partially completed; 1 project in planning and design with targeted completion of 2017.
- EPA requiring reductions from 6 MA WWTFs discharge upstream; 3 have completed upgrades
- Next several years are a critical period to track loading reductions and monitor upper bay in order to evaluate ecosystem response



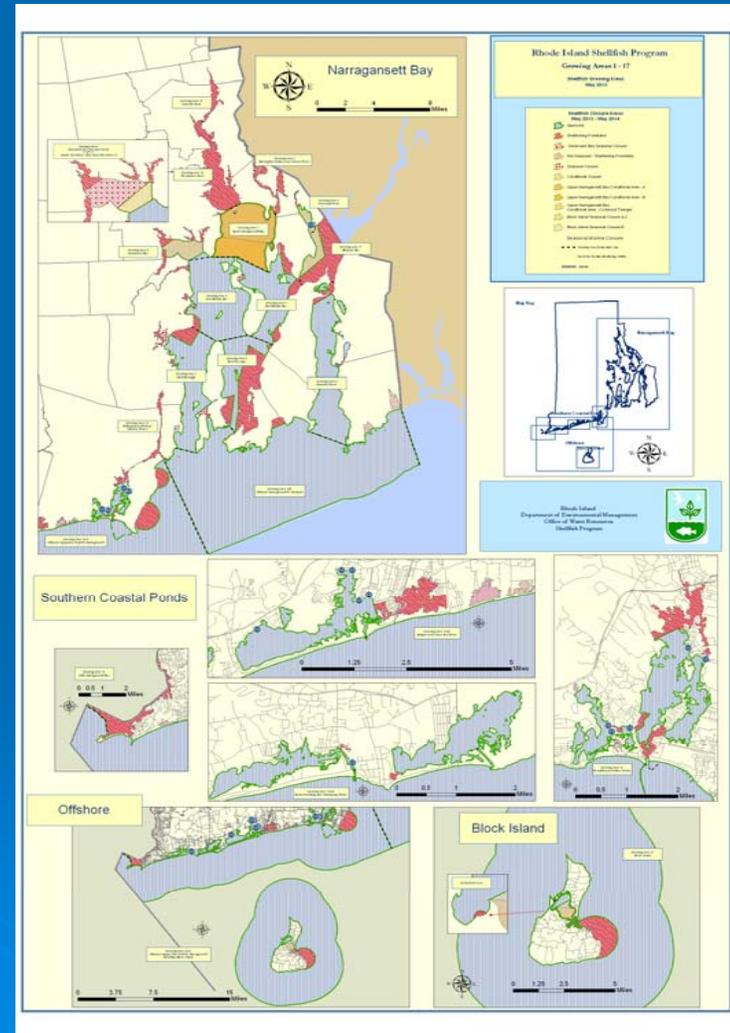


# Pathogens: Shellfish Growing Area Closures

- **23.4%** of shellfishing growing area waters do not have acceptable water quality due to elevated levels of pathogens (fecal coliform bacteria)



Major sources of pathogens:  
combined sewer overflows and  
stormwater runoff





# Narragansett Bay Commission's CSO Abatement Project

## Phase I

- Completed Nov 2008 at total cost of \$359 million
- 65 MG capacity Storage Tunnel, Pump Station, 7 drop shafts
- As of July 2013, 5 BG of combined water & wastewater treated at the Field's Point WWTF

## Phase 2

- Currently under construction - \$363 million





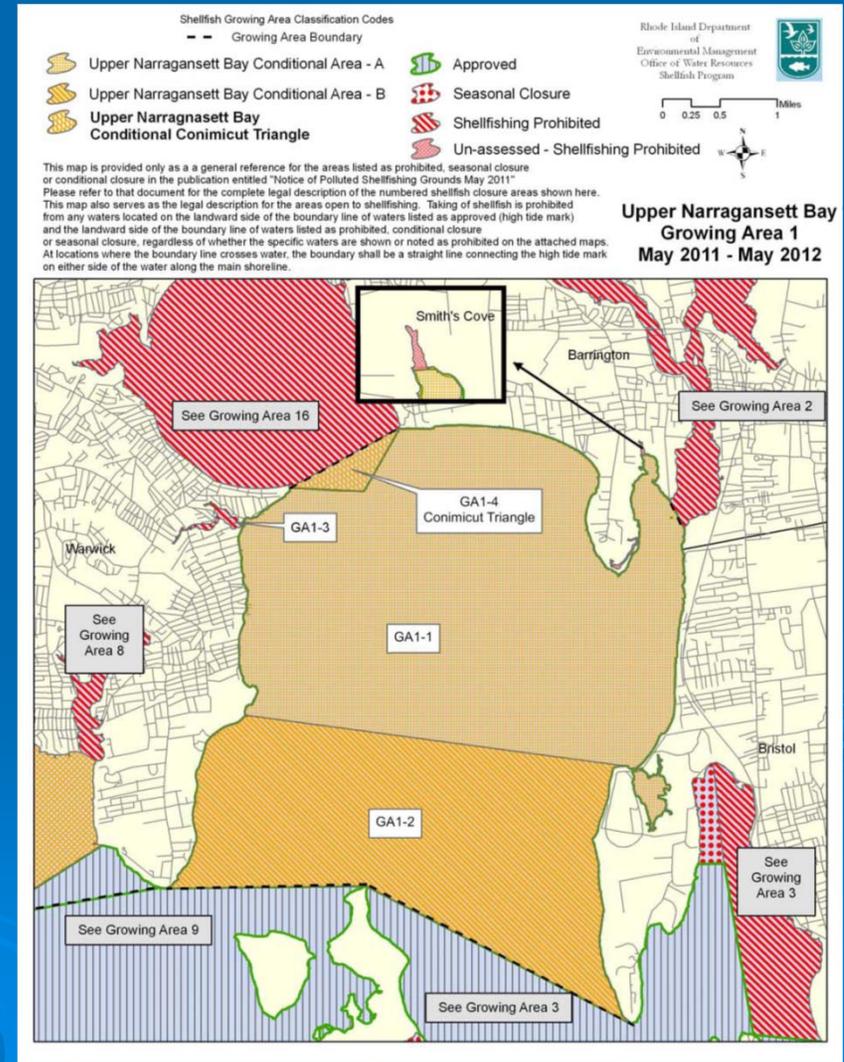
# 2011 Revisions to Conditional Closure Criteria

## Area "A"

- Revised from 0.5" to 0.8" of rainfall or greater in a 24 hour time period
- >0.5 mg of WWTF by-pass (14 MG Bucklin Pt. not counted)

## Area "B"

- Revised from 1.0 " to 1.5" of rainfall or greater in a 24 hour time period
- Fewer total closure days (2010-2012).





## Nutrients in freshwaters: Excessive plant growth, algal blooms & low dissolved oxygen



Phosphorus is nutrient of concern. Sources: WWTFs, OWTS, stormwater runoff.



# Emerging Issue: Cyanobacteria Blooms

- Cyanobacteria blooms (also known as blue-green algae)
  - 25 waterbodies with confirmed blooms during last three years
- Naturally occurring organisms that produce toxins that may be present in harmful quantities.



## News Release

RI Department of Environmental Management  
235 Promenade St., Providence, RI 02908  
(401) 222-2771 [www.dem.ri.gov](http://www.dem.ri.gov)

For Release: August 24, 2010

Contact: Gail Mastrati 222-4700 ext. 2402

### DEM, HEALTH ISSUE ADVISORY FOR TEN MILE RIVER, CENTRAL POND, TURNER RESERVOIR, AND OMEGA POND

#### Dogs are Particularly Susceptible to Effects from Toxin in Green Algae Bloom

PROVIDENCE - The Department of Environmental Management and the Department of Health (HEALTH) advise people that a recent algae bloom in the Ten Mile River, Central Pond, Turner Reservoir, and Omega Pond may form a naturally occurring algal toxin. People should avoid recreational activities (like swimming, boating, or fishing) in these areas until further notice. In addition, people should not drink water or eat fish from any of these areas.

During a recent sampling event, DEM observed a dense algae bloom turning the waters of Turner Reservoir a bright green color. DEM has confirmed the presence and predominance of the blue-green algae, Microcystis. These algae also referred to as cyanobacteria have the potential to form the naturally occurring algal toxin, Microcystin.

Symptoms of exposure to Microcystin in humans include stomach cramps, vomiting, diarrhea, fever, muscle and joint pain, and irritation of the skin, eyes and throat. People who have been drinking from, swimming, or fishing in these areas and experience those symptoms should contact their healthcare provider. People are advised to avoid contact with water if they see similar conditions (dense algae blooms, bright green colored waters) in other lakes and ponds.

According to Rhode Island State Veterinarian Scott Marshall, DVM, pets can also be affected by exposure to Microcystin. Pet owners should not allow pets to drink this water or swim in the water. Symptoms of exposure to Microcystin in dogs can include rapid onset of lethargy, difficulty breathing, vomiting, diarrhea, muscle rigidity or convulsions.

DEM advises that the algae bloom and the natural production of the toxin will likely resolve itself. This week's rainfall reduced some of the toxin-producing algae. DEM will re-sample the waters and will inform the public when algae levels are low. At that time, it will be safe to resume recreational activities in these areas.

Microcystis is a type of blue algae that grows naturally in many water bodies. Under certain conditions, such as warm weather and an abundance of nutrients in the water, the algae

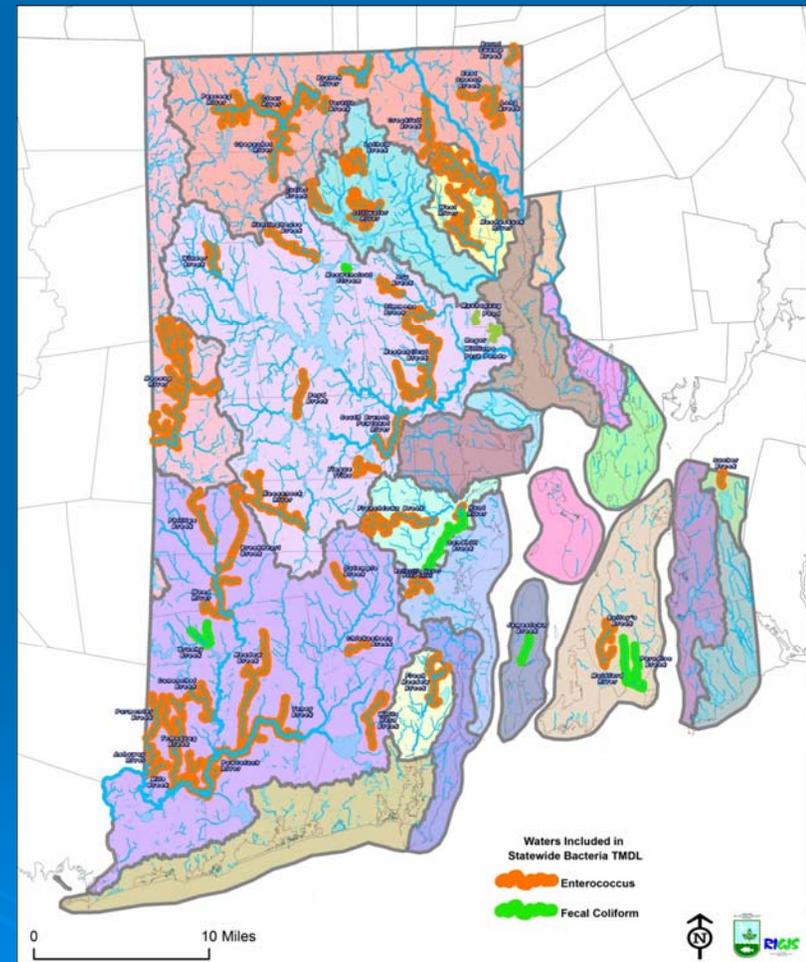




# Pathogens: bacteria levels unsafe for recreational uses in rivers



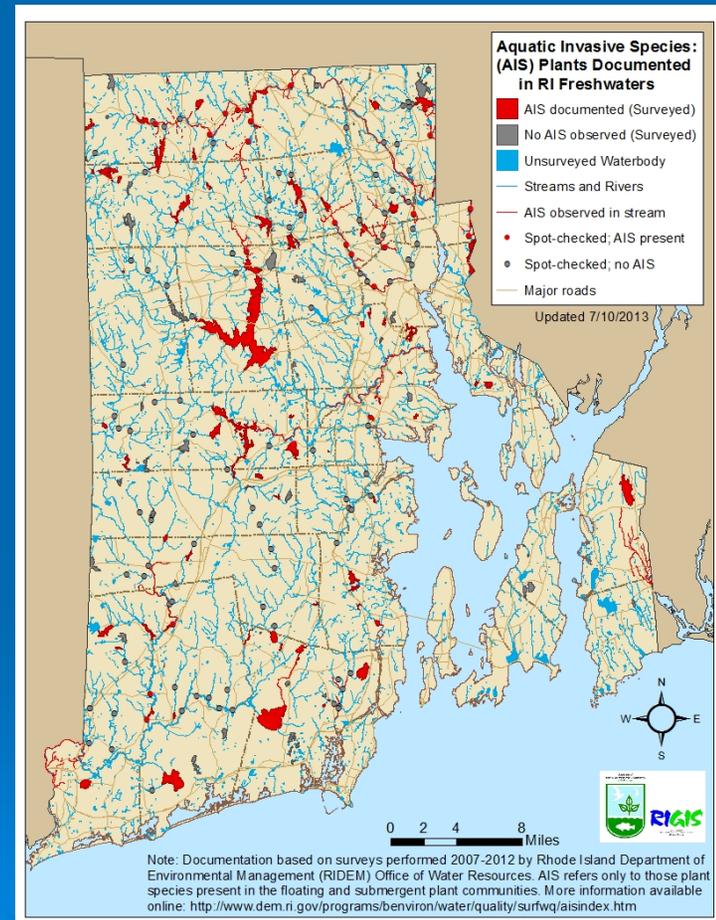
Potential Sources: On-site wastewater systems, stormwater runoff, sewer leaks, agricultural activities, wildlife and waterfowl.





# Aquatic Invasive Plants

Largest cause of impairment in lakes & ponds





# Major Issues

- Nutrient enrichment
- Pathogens
- Stormwater management
- Local capacity to implement needed water quality actions
- Sustainable financing to meet wastewater & stormwater infrastructure needs



# Stormwater Management

- Stormwater discharges are widespread sources of multiple pollutants.
- Need to improve maintenance on state and local levels.
- Need to retrofit existing infrastructure to provide adequate treatment.  
( TMDL requirements)

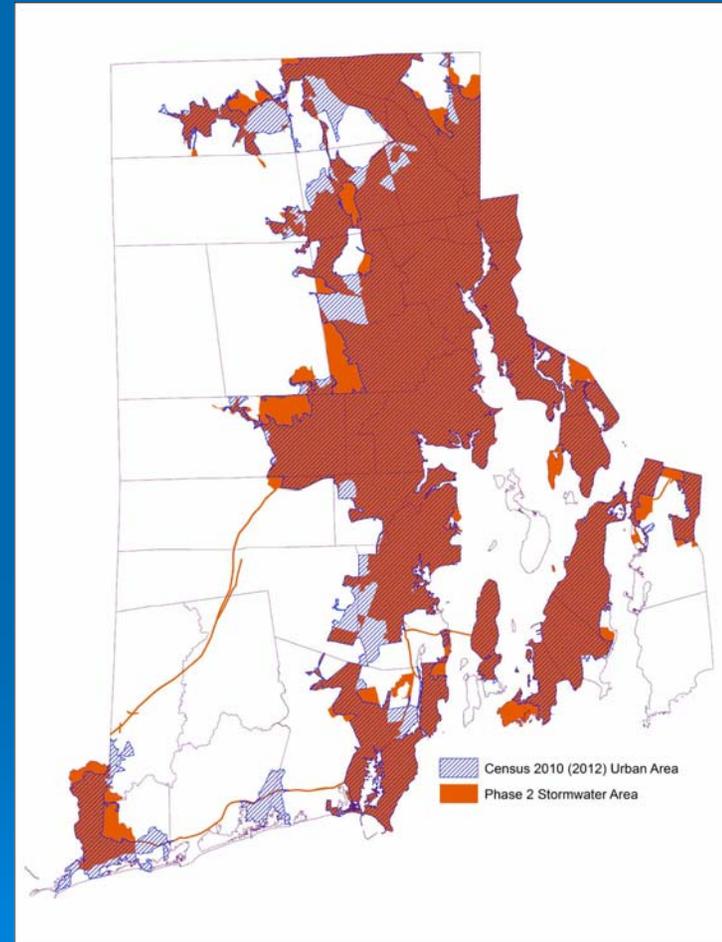


LID Photos: Horsley-Witten



# Local (Municipal) Capacity

- Limited resources or expertise constrains local implementation of:
  - MS4 stormwater activities
  - Water quality restoration projects
  - Wastewater facility planning updates
  - Local on-site wastewater programs
  - Low impact development practices





# Sustainable Funding

- 2012 Clean Water Needs Survey identified \$1.86 billion in capital needs (primarily wastewater).
- Clean Water Finance Agency is estimating a shortfall in needed funding of \$42.5 million for the period 2015-2019.
- Several projects underway to explore viability of Stormwater Utility Districts.



# Water Quality Management Planning Process

- Working with Advisory Committee
- Monthly meetings through April
- Topical focus to meetings; three to date
- Outreach to stakeholders
- Draft plan – April 2014
- Public review of draft plan
- Work with DOA to finalize plan



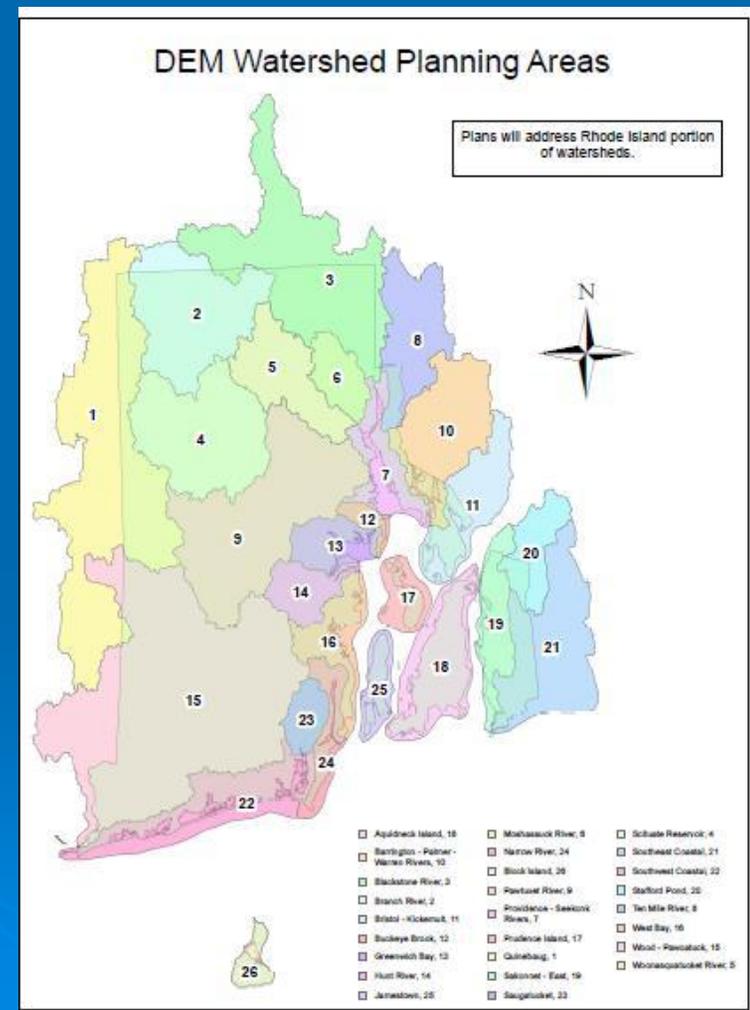
# Water Quality Management Plan Contents

- Summary of existing water quality conditions and challenges; trend information where available
- Pollution sources & other threats– wastewater, stormwater, other; e.g. boating, agriculture, fertilizers, etc.
- Aquatic habitat management: wetlands, stream connectivity, invasive species, buffers
- Watershed framework & resources for implementation
- Policies, strategies and recommended actions



# Watershed Framework

- Define roles of governmental, non-governmental and private sector in watershed protection and restoration.
- Divide RI into 26 watershed planning areas.
- Work with existing watershed councils.
- Develop watershed –based plans ( 5 year outlook).
- Encourage greater alignment of resources to optimize results: demonstrate progress toward water quality goals.





# Key Discussion Point

- Priority Setting in a time of limited resources -
  - Protection versus restoration
  - Within and among watersheds
  - By waterbody use:
    - drinking water supply
    - Shellfishing
    - recreation
    - ecological functions

