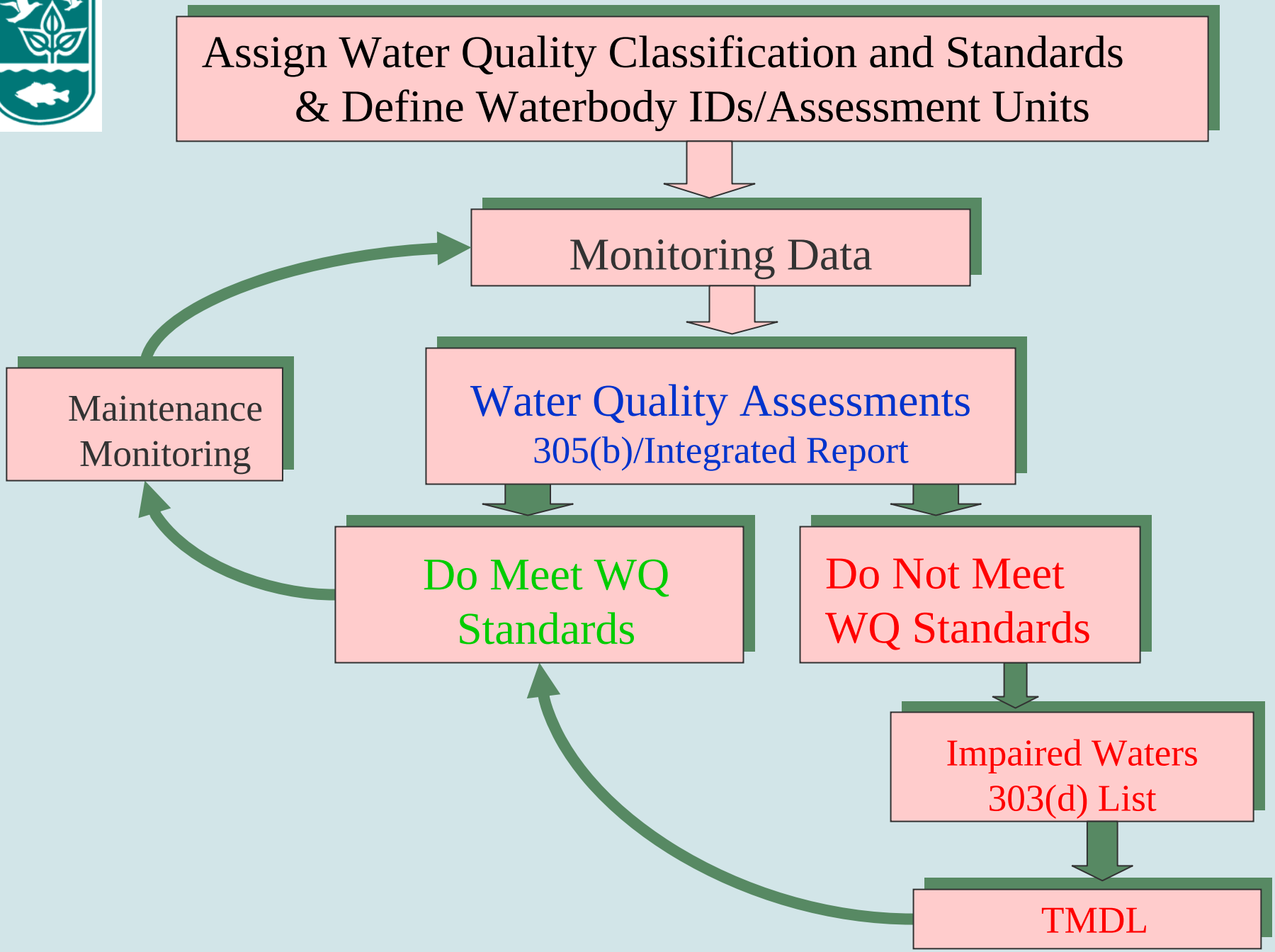
Rhode Island's Draft 2012 Integrated Lists

RIDEM

Office of Water Resources

Clean Water Act Requirements

- **Establish water quality standards for the state's waters**
- **Monitor, Assess and Report water quality conditions of the state's waters (CWA §305(b))**
- **Identify and list impaired waters i.e water where traditional technology based pollution controls are not adequate to meet *water quality standards* (CWA §303(d))**
- **Prioritize a schedule for development of total maximum daily loads (TMDLs) for all 303(d) listed waters**


Assign Water Quality Classification and Standards
& Define Waterbody IDs/Assessment Units
Monitoring Data
Water Quality Assessments
305(b)/Integrated Report
Maintenance
Monitoring
Do Meet WQ
Standards
Do Not Meet
WQ Standards
Impaired Waters
303(d) List
TMDL

WATER QUALITY STANDARDS

(Designated Uses and **Criteria** to protect those Uses**)**

Designated Uses -
Goal Uses of the waterbody (fish consumption, swimming, aquatic life, drinking water, etc.)

Water Quality Criteria -
Pollutant thresholds (numeric and narrative) to protect Designated Uses

Water Classifications (Class AA, A, B, SA, SB, etc)
Each Class is defined by a set of Designated Uses

Water Quality Classifications and Designated Uses

Integrated Report Designated Use	Applicable Classification of Water	Designated Use Definitions
Drinking Water Supply	AA	The waterbody can supply safe drinking water with conventional treatment.
Primary Contact Recreation/Swimming	AA, A, B, B1, B{a}, B1{a}, SA, SA{b}, SB, SB{a}, SB1, SB1{a} **(all surface waters)**	Swimming, water skiing, surfing or other recreational activities in which there is prolonged and intimate contact by the human body with the water.
Secondary Contact Recreation/Swimming	AA, A, B, B1, B{a}, B1{a}, SA, SA{b}, SB, SB{a}, SB1, SB1{a} **(all surface waters)**	Boating, canoeing, fishing, kayaking or other recreational activities in which there is 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	AA, A, B, B1, B{a}, B1{a}, SA, SA{b}, SB, SB{a}, SB1, SB1{a} **(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}	The water 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	Water are suitable for the transplant of shellfish to Class SA waters for ambient depuration and controlled harvest.
Fish Consumption	AA, A, B, B1, B{a}, B1{a}, SA, SA{b}, SB, SB{a}, SB1, SB1{a} **(all surface waters)**	The waterbody supports fish free from contamination that could pose a human health risk to consumers.

Water Quality Standards

Water Quality Criteria

- Pollutant concentrations
  (metals, nutrients)
- Conventional concentrations
  (DO, temperature, pH)
- Bacteria concentrations
- Condition of biological community and habitat
- Narrative – “No Toxics in Toxic Amounts”

WBIDs/Assessment Units

- **Unique identifying number** for each waterbody or waterbody segment
- Allows for **tracking** of Assessment Information and **Indexing** in RIGIS for mapping
- WBIDs are assigned by **Waterbody type**

  (Lake, River, Estuary, Coastal)
- WBIDs assigned to **reflect changes**

  (hydrologic drainage basin, assessment status, land use, shellfish growing area status, cold water or warm water fishery)
- **RI0008040R-03A**

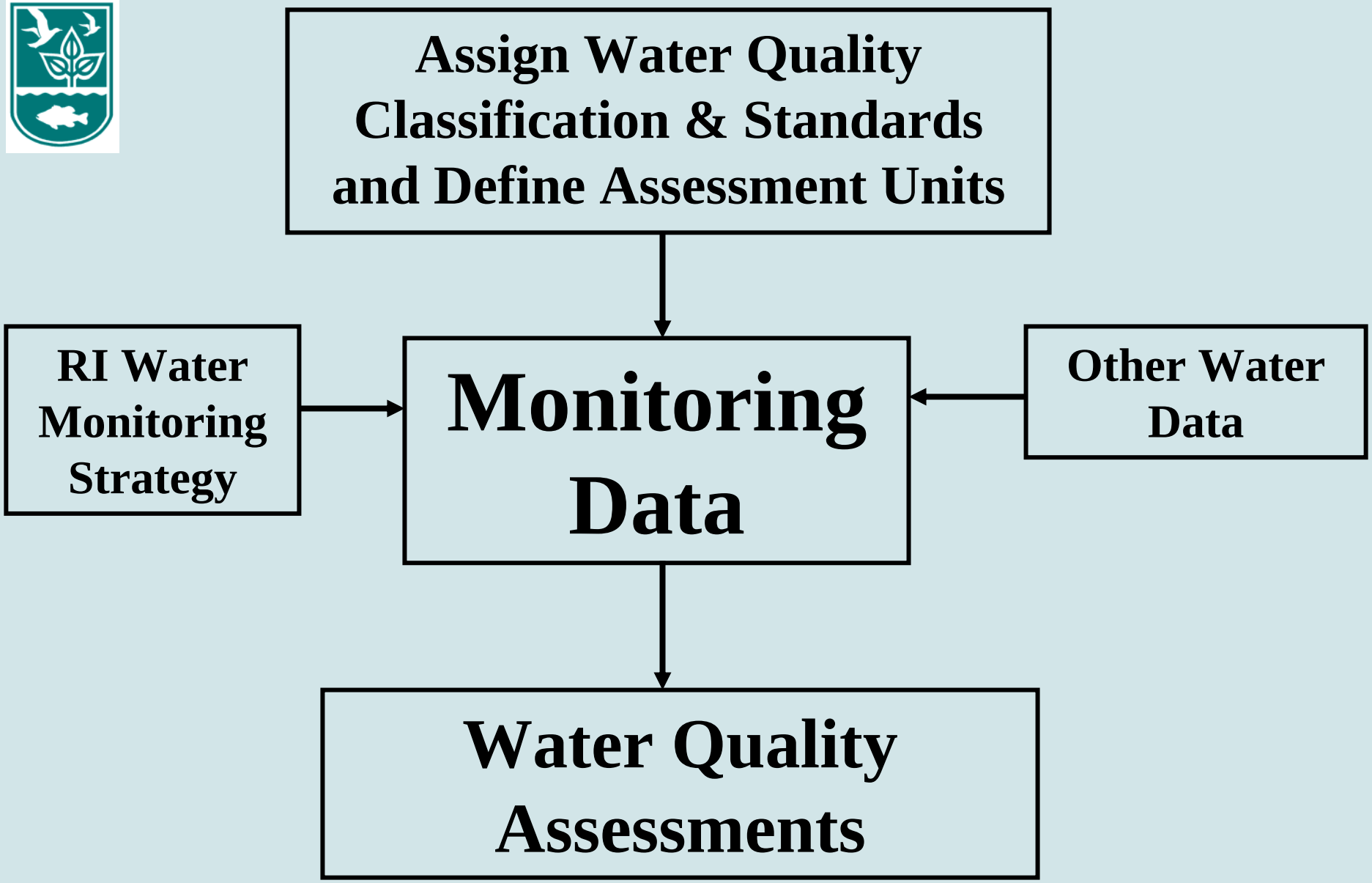
  RI0008 = Basin Name (Pawcatuck River Basin)

  040 = Subbasin Name (Wood River Subbasin)

  R = Waterbody type (**R**iver, **L**ake, **E**stuary, **C**oastal)

  -03 = Waterbody Name (Brushy Brook)

  A = segment of the waterbody


Assign Water Quality Classification & Standards and Define Assessment Units
RI Water Monitoring Strategy
Monitoring Data
Other Water Data
Water Quality Assessments

Rhode Island Water Monitoring Strategy

- Completed by DEM in September 2005
- Developed in coordination with the RI Environmental Monitoring Collaborative (RIEMC) & RI Bays, Rivers and Watersheds Coordination Team (CT)
- DEM will be updating the strategy in collaboration with RIEMC

http://www.ci.uri.edu/Projects/RI-Monitoring/Docs/DEM_WQ_Oct_14_05.pdf

Fixed Site Monitoring in Narragansett Bay

13 stations: 5 on docks; 8 on buoys

DEM, URI-GSO, NBC, NBNERR,

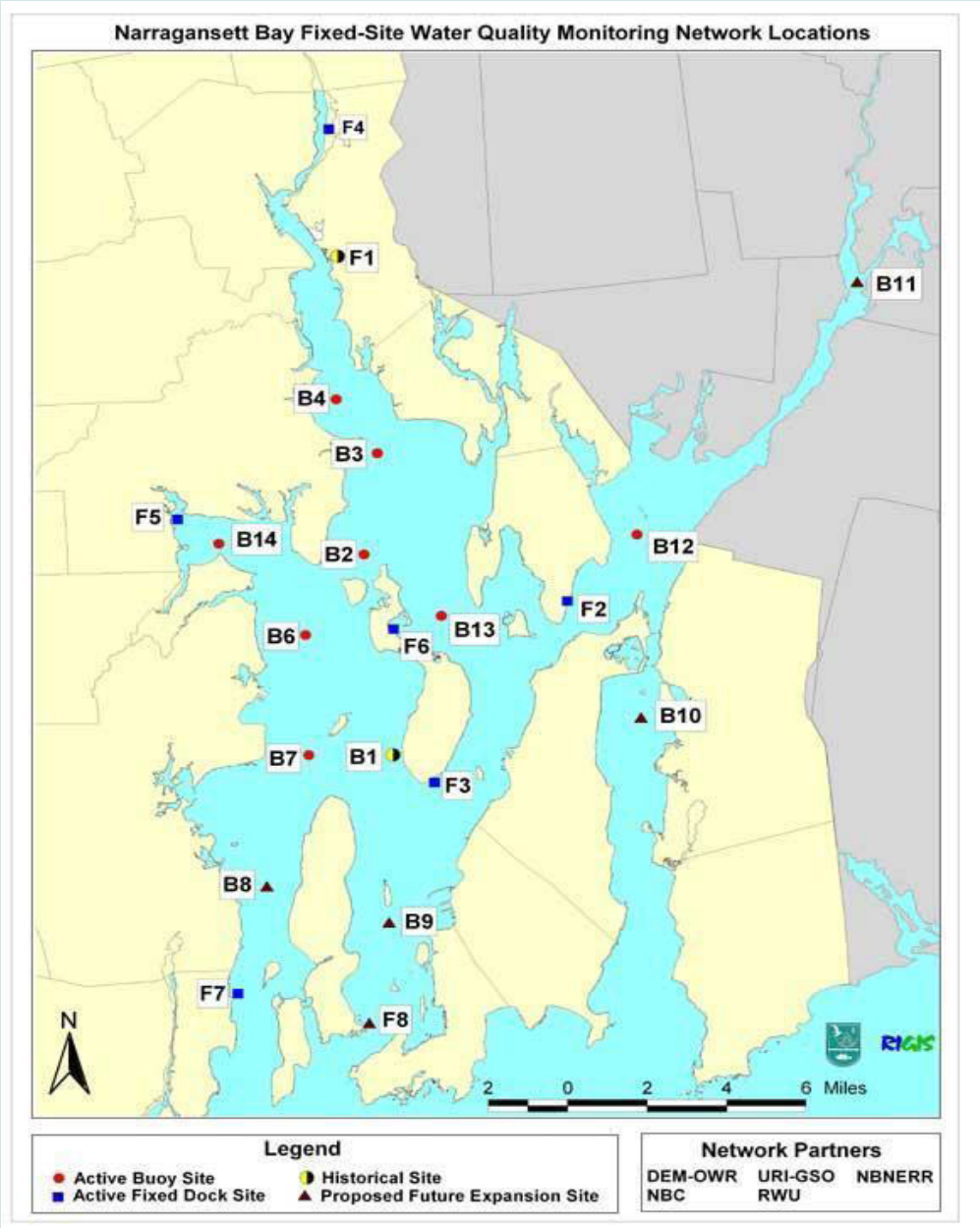
Standardized instrumentation

Network stations measure water quality every 15 minutes - dissolved oxygen, temperature, salinity

<u>Critical Uses of Data:</u>

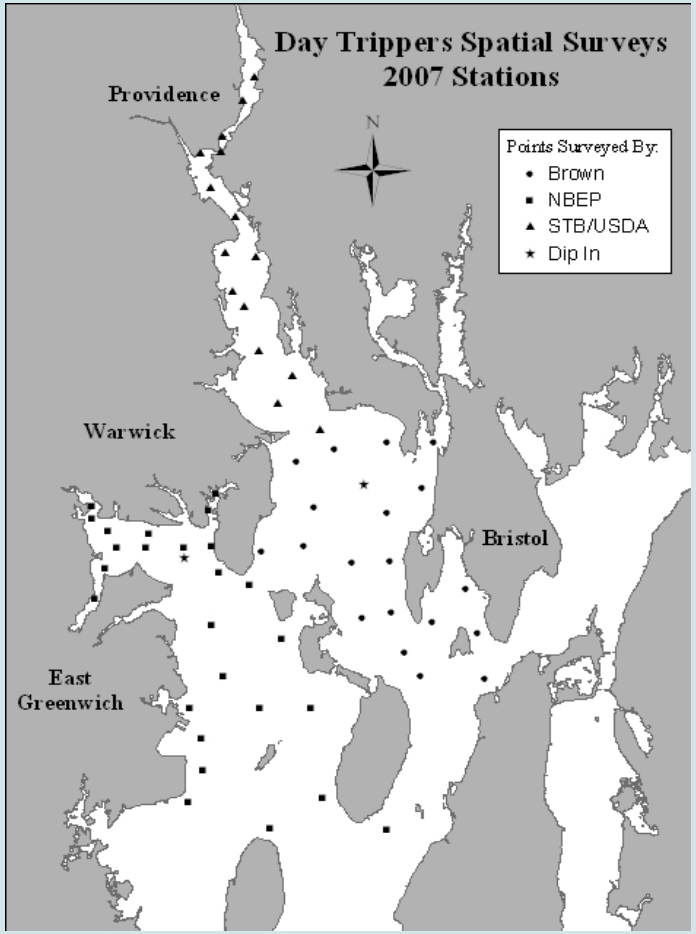
- **Early warning system for low oxygen events thru the summer;**
- **Evaluate effects of nutrient reductions and adjust management strategies as needed;**
- **Understand and respond to ecosystem changes**

Fixed Site Network



Dissolved Oxygen Surveys

"Day Trippers"



- Multi-agency effort to provide spatial coverage of the upper Bay
- Three boats profile the water column in 75 locations
- Targeted to when Bay is vulnerable to hypoxia (neap tides)

www.geo.brown.edu/georesearch/insomniacs

RIDEM Shellfish Monitoring Program

Water quality sampling

Shoreline surveys

Large River Water Quality Monitoring

- **DEM contract with USGS:**

  Currently monitor at 6 stations on the Blackstone, Branch Pawtuxet, and Pawcatuck Rivers (monthly)

- **Biological monitoring in deep rivers**

- **Ambient River Monitoring**

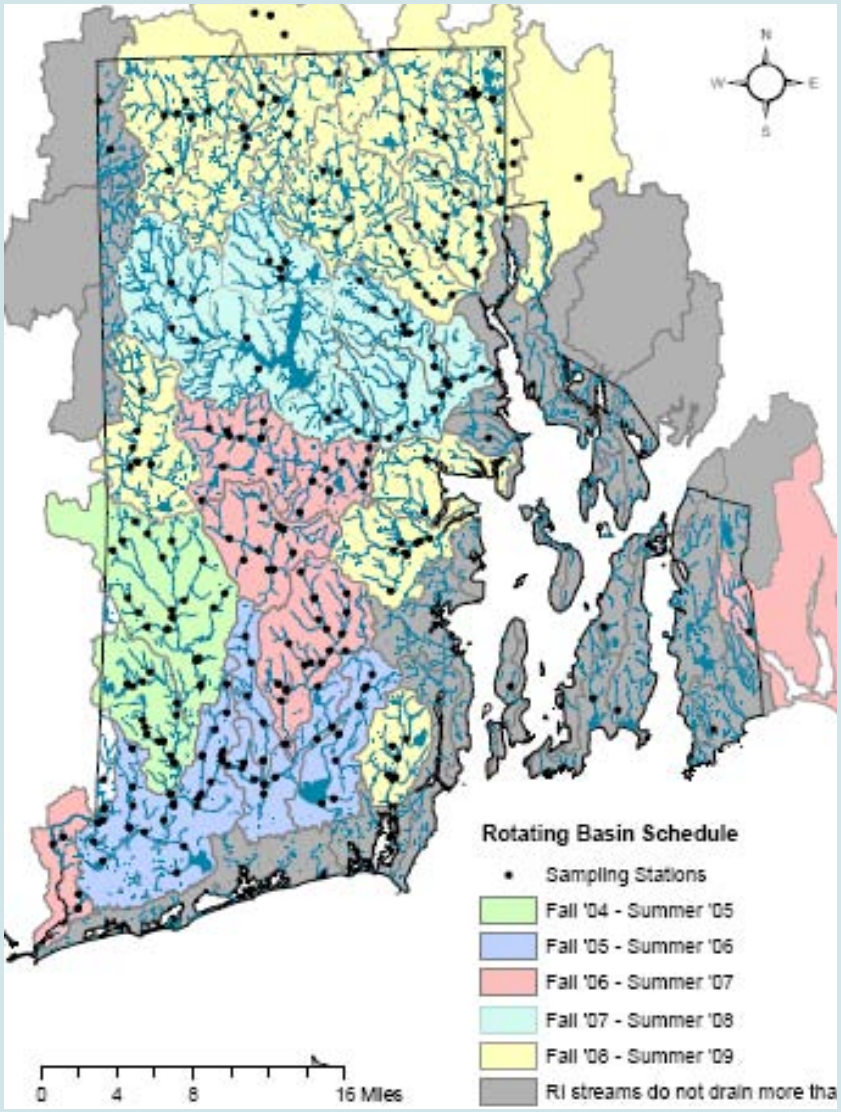
Ambient River Monitoring

Rotating Basin Approach

- **Assess the quality of all rivers and streams over 5 year cycle integrating chemical, biological and physical monitoring; to understand watershed health.**

- **Initiated first rotating cycle in 2004 and completed in 2009 for all rivers and streams in RI which drain greater than 5 square miles.**

- **Second cycle began in May 2011**



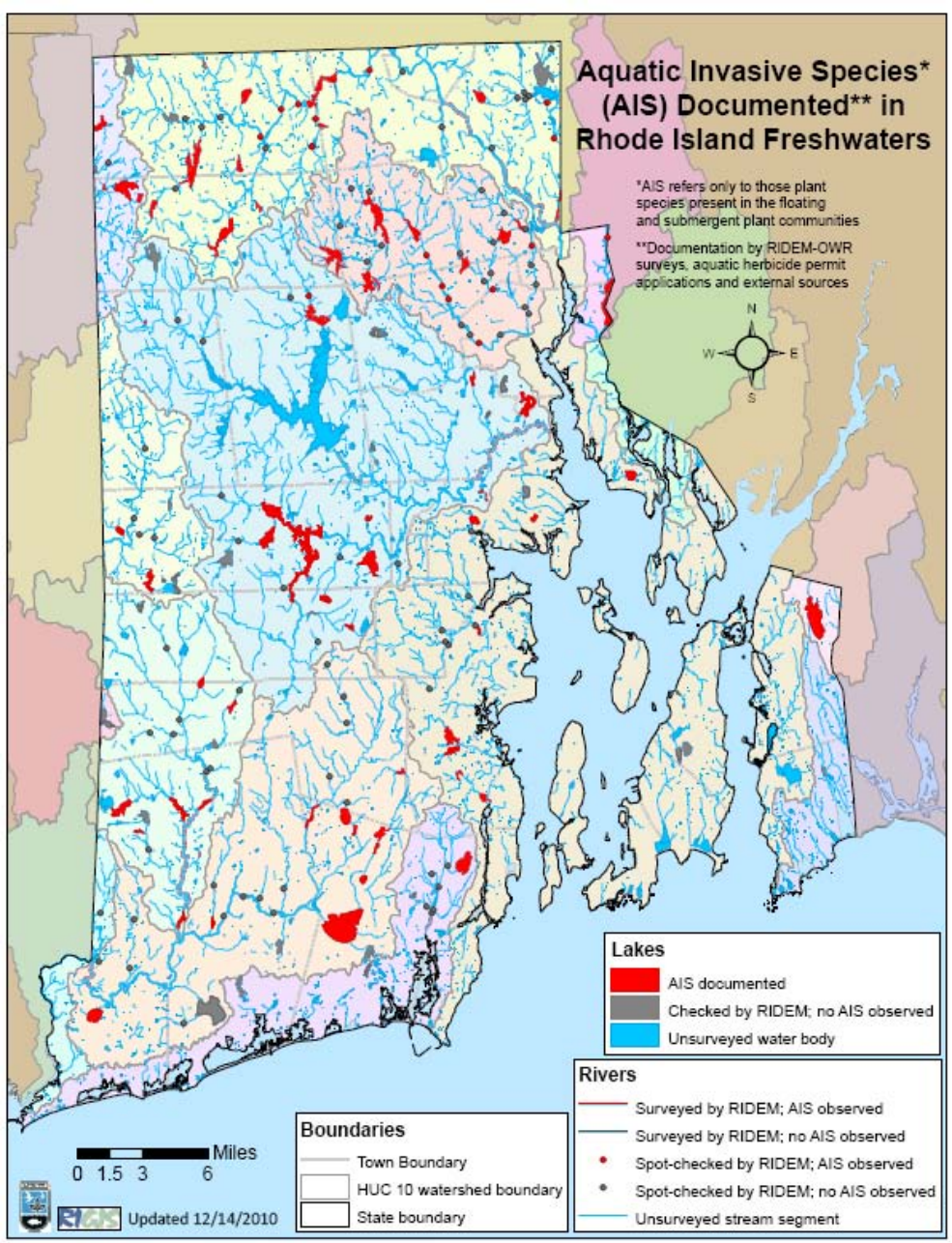
Ambient River Monitoring

Water Chemistry Sampling

Ambient River Monitoring

Macroinvertebrate Sampling in Wadeable Streams

Growing emphasis on biological indicators.


Aquatic Invasive Species* (AIS) Documented** in Rhode Island Freshwaters
*AIS refers only to those plant species present in the floating and submergent plant communities
**Documentation by RIDEM-OWR surveys, aquatic herbicide permit applications and external sources
N
W
E
S
Lakes
AIS documented
Checked by RIDEM; no AIS observed
Unsurveyed water body
Rivers
Surveyed by RIDEM; AIS observed
Surveyed by RIDEM; no AIS observed
Spot-checked by RIDEM; AIS observed
Spot-checked by RIDEM; no AIS observed
Unsurveyed stream segment
Boundaries
Town Boundary
HUC 10 watershed boundary
State boundary
Miles
0 1.5 3 6
Updated 12/14/2010

Lake Monitoring
URI Watershed Watch

- Over 350 Active Volunteers
- 133 Lake sites since 1988
- Water Analyses

- **Secchi Depth**
- **Chlorophyll *a***
- **Dissolved Oxygen**
- **Temperature**
- **Alkalinity**
- **pH**
- **Nutrients**
- **Bacteria**

Other Datasets Used for Assessments

- **Volunteer Data**
  - Watershed Watch
  - NRPA
  - WPWA
  - Salt Pond Watchers
  - Blackstone River Coalition
  - Save The Bay
- **Agency Data**
  - Narragansett Bay Commission
  - Providence Water Supply Board
  - Pawtucket Water Supply Board
  - City of Newport

Other Datasets Used for Assessments

- TMDL Data
- HEALTH - Fish Consumption Advisories
- HEALTH - Drinking Water Quality data

Comprehensive Assessment of Water Quality Conditions

- Utilize **readily available data** from federal and state agencies, universities, and volunteers
- Conducted annually and published biennially as the state's **Integrated Report** (formerly in Section 305(b), State of the State's Waters Report and Section 303(d) Impaired Waters List)
- Review data and **evaluate for compliance with water quality standards**, i.e. designated use and criteria

CALM

Consolidated **A**ssessment and **L**isting **M**ethodology

- Framework of the decision-making process for water quality assessments
- Defines the data ***quality*** and ***quantity*** requirements
- Defines the process for determining water quality status
- Category 1 – 5 Integrated Report Lists

www.dem.ri.gov/programs/benviron/water/quality/pdf/finlcalm.pdf

Assessment Methodology

- Waterbody (WBID) specific
- Evaluate data for DQO and DQA
- Weight of Evidence Approach
- Age and Quantity of Data Sets
- Quality of Data (detection limits)
- Water Quality Assessments = Attainment Status of Criteria for each Designated Use (Fully supporting or Impaired)

Designated Uses and Indicators for Attainment Evaluations

CALM

Designated Use	Indicators Evaluated For Attainment Of This Use *
Drinking Water Supply	• Compliance with SDWA standards (MCLs) in the finished drinking water (HEALTH) • Finished Drinking Water Restrictions – use advisories associated with source water contamination (HEALTH) • Treatment Requirements – contaminants in source water that requires more than conventional treatment (HEALTH) • Fecal coliform bacteria (terminal reservoir) (RI WQRegs)
Swimming/ Primary and Secondary Recreation	• **Enterococci** (RI WQRegs); • **Fecal coliform bacteria** (RI WQRegs); • **Beach closure information for designated beach waters** (HEALTH) • Minimum water quality general criteria and aesthetics (narrative criteria) (RI WQRegs)
Fish, other Aquatic Life, and Wildlife	• **Biological (macroinvertebrate) data including physical habitat information** (RI QRegs) • **Conventional parameters** (RI WQRegs) • Toxic parameters in water column (RI WQRegs) • Toxicity data (RI WQRegs) • Minimum water quality general criteria and aesthetics (narrative criteria) (RI WQRegs)
Shellfish Consumption/ Depuration	• **Fecal coliform bacteria** (RI WQRegs) • **RI Shellfish Growing Area Monitoring Program classifications** • Minimum water quality general criteria and aesthetics (narrative criteria) (RI WQRegs)
Fish Consumption	• **Fish consumption advisories for specific waterbodies** (HEALTH)

* Core indicators are represented in **BOLD** lettering.

Integrated Report Listing Categories

1. Attaining criteria for all designated uses
2. Attaining some designated uses, & insufficient or no data/ information to determine if remaining uses are attained
3. Insufficient or no data and information to determine if any designated use is attained
4. Impaired or threatened for one or more designated uses but not needing a TMDL:
   - A. TMDL has been completed and approved by EPA
   - B. Other pollution control requirements to result in attainment
   - C. Not impaired by a pollutant

303(d) List

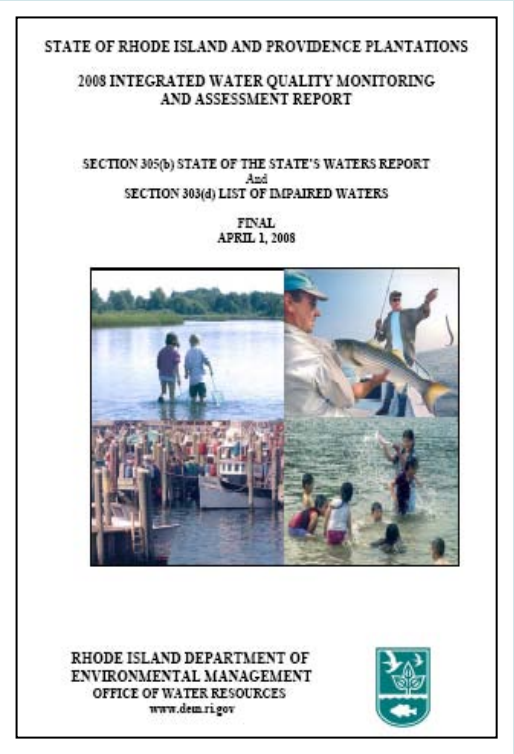
5. Impaired or threatened by pollutant(s) for one or more designated uses and requiring a TMDL

Integrated Water Quality Monitoring and Assessment Report

Integrated Report consists of:

- **Water Quality Assessment Information**
  - Summary Statistics
  - Required § 305(b) Narrative

- **Five Integrated Lists**
  - Category 5 List = 303(d) Impaired Waters List



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

2008 INTEGRATED WATER QUALITY MONITORING AND ASSESSMENT REPORT

SECTION 305(b) STATE OF THE STATE'S WATERS REPORT
And
SECTION 303(d) LIST OF IMPAIRED WATERS

FINAL
APRIL 1, 2008

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
www.dem.ri.gov

Draft 2012 IR Category Lists Summary

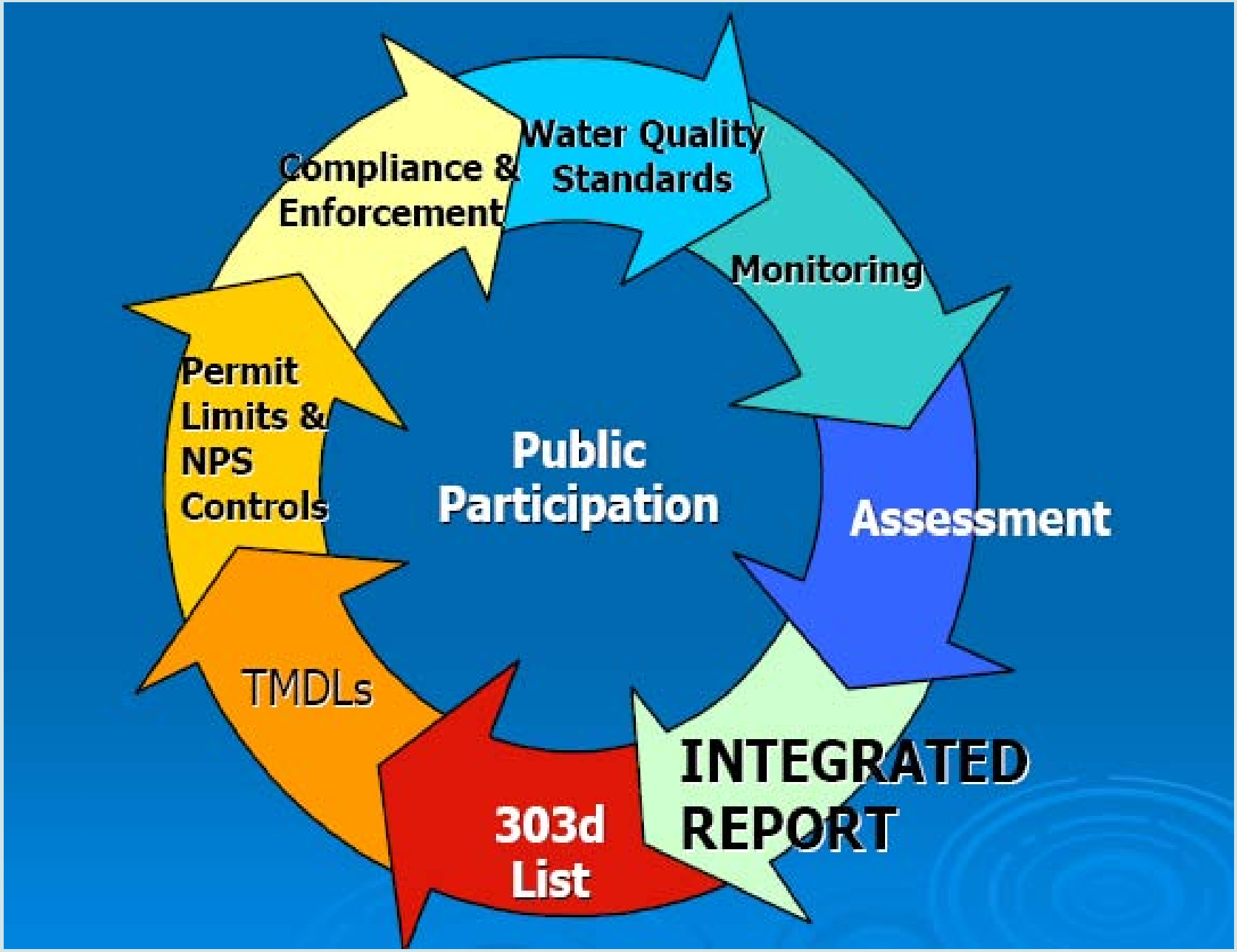
Category	Waterbody Type				2012 Totals (WBIDs/ AU #s)	2010 Totals (WBIDs/ AU #s)
	Estuarine	Rivers	Lakes	Coastal		
1	13	1	2	0	16	15
2	64	87	38	1	190	188
3	3	291	100	0	394	392
4A	17	67	32	0	116	77
4B	0	0	0	0	0	0
4C	1	4	39	0	44	47
5	34	61	25	0	120	162
Totals	132	511	236	1	880	881

Summary Statistics for Draft 2012 Integrated Report

- **Of the 1,420 river miles in the state, 917 miles (65%) are considered assessed and of these, 551 miles (60%) are impaired, and 246 miles (27%) are impaired and scheduled for a TMDL.**

- **Of the 20,749 acres of lakes & ponds in the state, 15,281 acres (74%) are considered assessed and of these, 8,455 acres (55%) are impaired, and 1,369 acres (9%) are impaired and scheduled for a TMDL.**

- **Of the 159 sq. miles of estuarine waters in the state, nearly 100% are considered assessed and of these, 56.3 sq. miles (35%) are impaired, and 50 sq. miles (31.5%) are impaired and scheduled for a TMDL.**

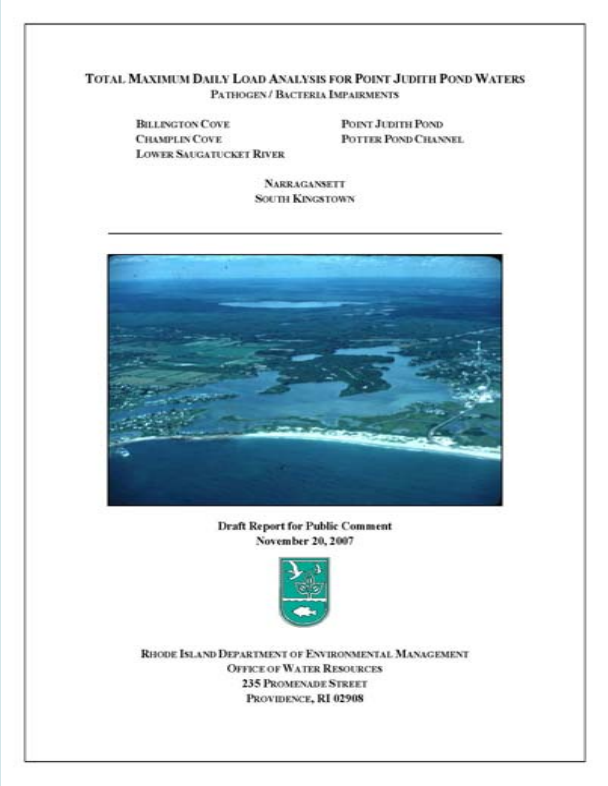

Water Quality Standards
Monitoring
Assessment
INTEGRATED REPORT
303d List
TMDLs
Permit Limits & NPS Controls
Compliance & Enforcement
Public Participation

Section 303(d) of the federal Clean Water Act

- **Each state shall identify impaired waters (those waters that do not meet *water quality standards* with existing required technology-based pollution controls alone)**
- **Priority rankings shall be assigned to each of the waterbodies**
- **A *Total Maximum Daily Load* (TMDL) shall be established for each of these waterbodies**

What is a Total Maximum Daily Load?

- **Water Quality Restoration Study**
- **Determines amount of a pollutant that can be discharged into a water body and still maintain water quality standards**
- **TMDL equals the sum of pollutant allocations for point sources (non-stormwater & stormwater), non-point sources, & a margin of safety**



TOTAL MAXIMUM DAILY LOAD ANALYSIS FOR POINT JUDITH POND WATERS
PATHOGEN / BACTERIA IMPAIRMENTS

BILLINGTON COVE
CHAMPLIN COVE
LOWER SAUGATUCKET RIVER
POINT JUDITH POND
POTTER POND CHANNEL

NARRAGANSETT
SOUTH KINGSTOWN

Draft Report for Public Comment
November 20, 2007

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 PROMENADE STREET
PROVIDENCE, RI 02908

TMDL Scheduling

- All impairments scheduled for TMDL development
- Priority given to drinking water & shellfish use impairments
- Schedule for TMDL development considers ongoing/planned pollution abatement projects, and watershed protection &restoration efforts

Ten Mile at Hunt's Mill

West Warwick WWTF Upgrade

Listing Trends

303(d) list	# of Waterbodies	Waterbody Impairments
2012	96	178
2010	132	234
2008	112	196
2006	161	273
2004	136	234
2002	130	233
2000	116	202

Differences between 2010 and 2012 303(d) lists

- **Decrease in number of waterbodies on 303d list from 132 in 2010 to 96 in 2012**
- **Decrease in number of waterbody impairments from 234 in 2010 to 178 in 2012**
- **New Listings of impairments**
- **De-listing of impairments**
- **Schedule shifts for TMDL development**

New Impairments on 2012 303(d) List

- Lower Blackstone River - Lead
- Clear River - Lead
- Upper Ten Mile River -Fecal Coliform, Total Phosphorus (transferred from Slater Park Pond listing)

Impairments Proposed for De-listing

- **Sandy Pond (S. of Airport) (Little Pond) - Fecal Coliform**
- **Unnamed Tribs to Slack Reservoir – Enterococcus**
- **Statewide Bacteria TMDL: 49 waterbody impairments moved to Category 4A**

Shifts in TMDL Development Schedule

- **Phosphorus Impaired Lakes: 2016**
- **Pawtuxet River watershed impairments: 2018 and 2020**
- **Metals and biodiversity impairments on various rivers: 2018**
- **Coastal Waters Nutrients/Dissolved Oxygen: 2020**
- **Branch River watershed metals & biodiversity impairments: 2020**
- **CSO & WWTF discharge impacted waters tied to scheduled improvements**

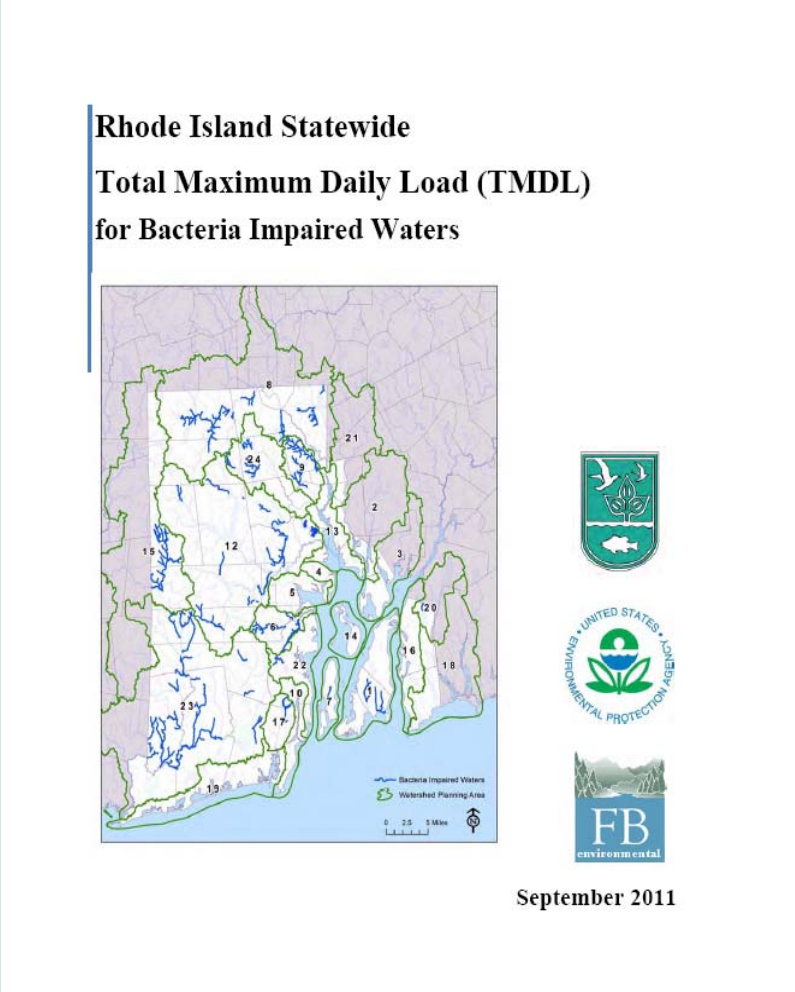
Overview of Water Quality Restoration Efforts

TMDL Reports

- **Establish the pollutant reductions needed to restore water quality**
- **Typically watershed-based**
- **Recommend specific pollution abatement actions**
- **Need to be approved by EPA**

TMDLs Completed to Date

- TMDLs addressing a total of 168 related impairments/ causes on 159 assessment units (WBIDs) accounting for 134 distinctly named waterbodies
- Since publication of 2010 303(d) list, RIDEM has completed Statewide Bacteria TMDL addressing 52 impaired surface waters (57 WBID)


Rhode Island Statewide
Total Maximum Daily Load (TMDL)
for Bacteria Impaired Waters

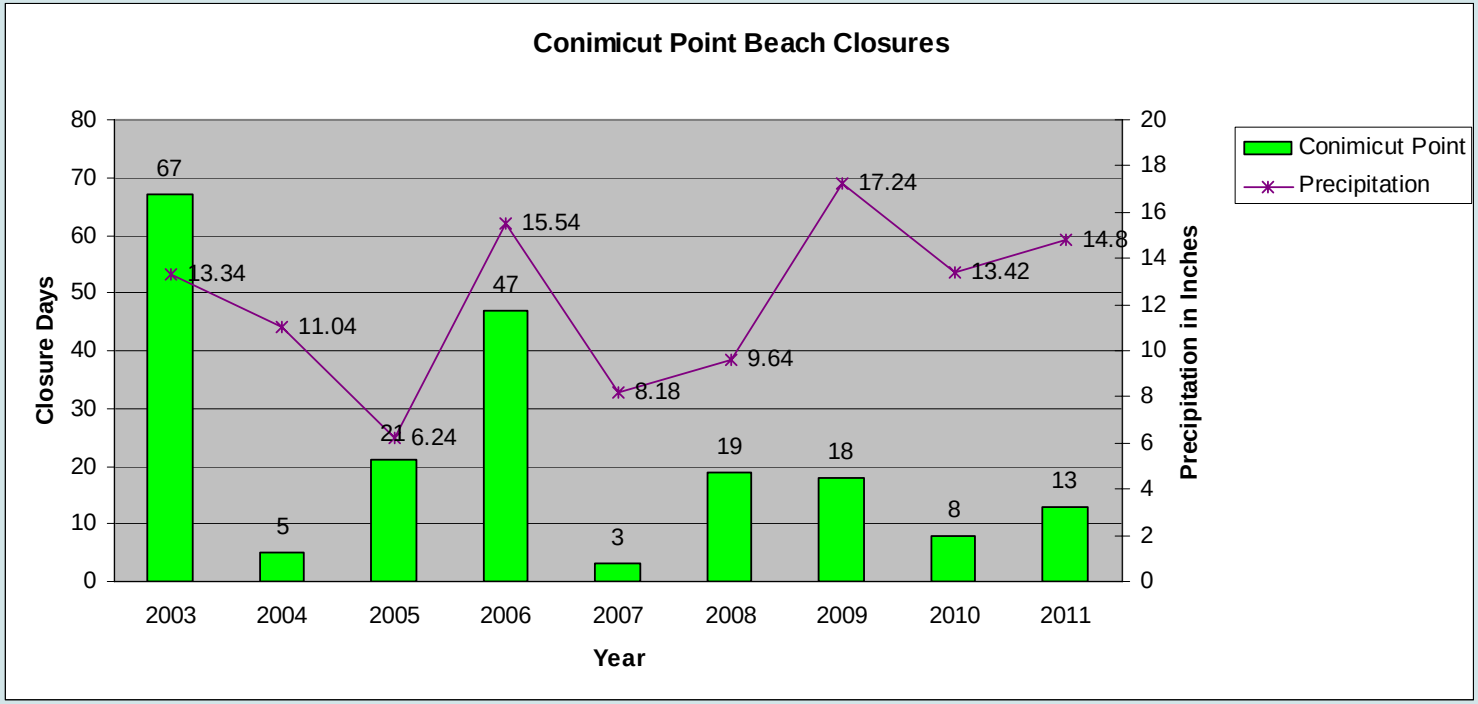
September 2011

WQ Restoration Studies in Progress

- **Blackstone River, Peters River, Mill River, & Cherry Brook (metals &/or pathogens): 2012**
- **Ten Mile River, Central Pond, Turner Reservoir, & Omega Pond (pathogens, metals, &/or nutrients): 2012**
- **Buckeye Brook (biodiversity): 2013**
- **Scott Pond (phosphorus, DO & copper): 2013**
- **Statewide Bacteria TMDL: 2014**
  - **Lower Pawcatuck River**
  - **Pierce Brook**
  - **Acid Factory Brook**
  - **Baker Brook**

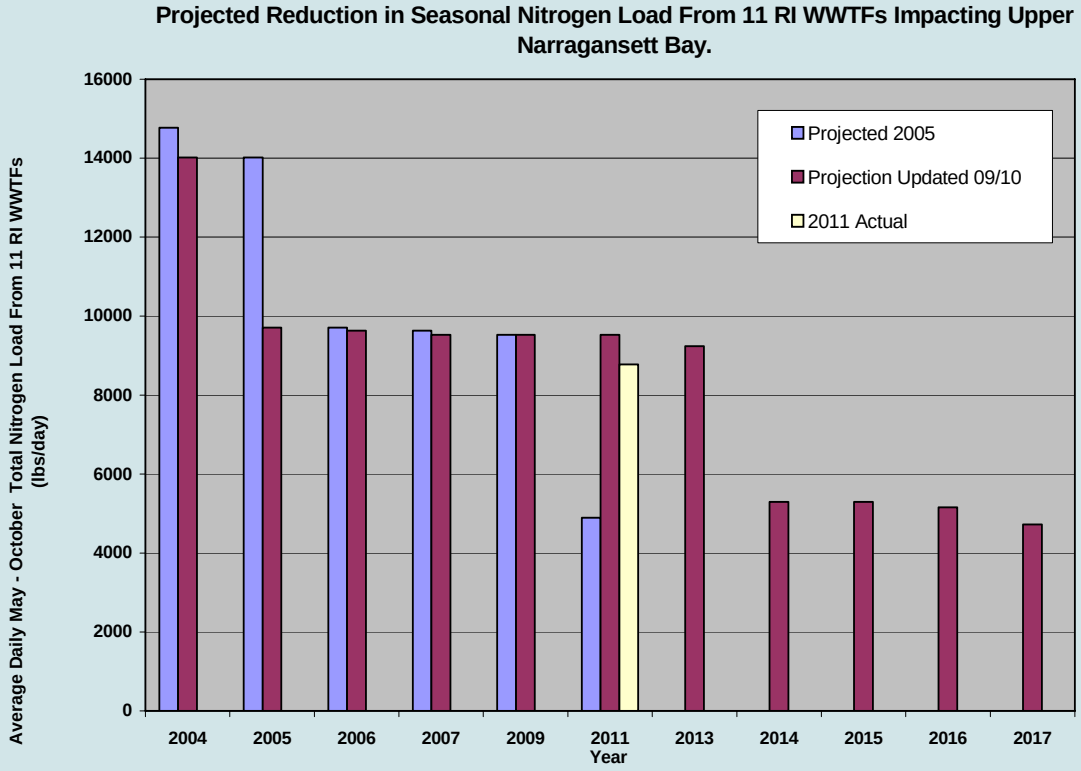
Ongoing Pollution Abatement Efforts Upper Narragansett Bay

- **Improved WQ resulting from construction of NBC Phase I CSO tunnel allowed DEM to change closure criteria in May 2011 from 0.5” to 0.8” of rain for Conditional Area A and from 1.0” to 1.5” for Conditional Area B**
- **Change resulted in 21 additional harvest days in Area A, June – Dec 2011**
- **Phase II design completed & construction due to be completed 12/2014**



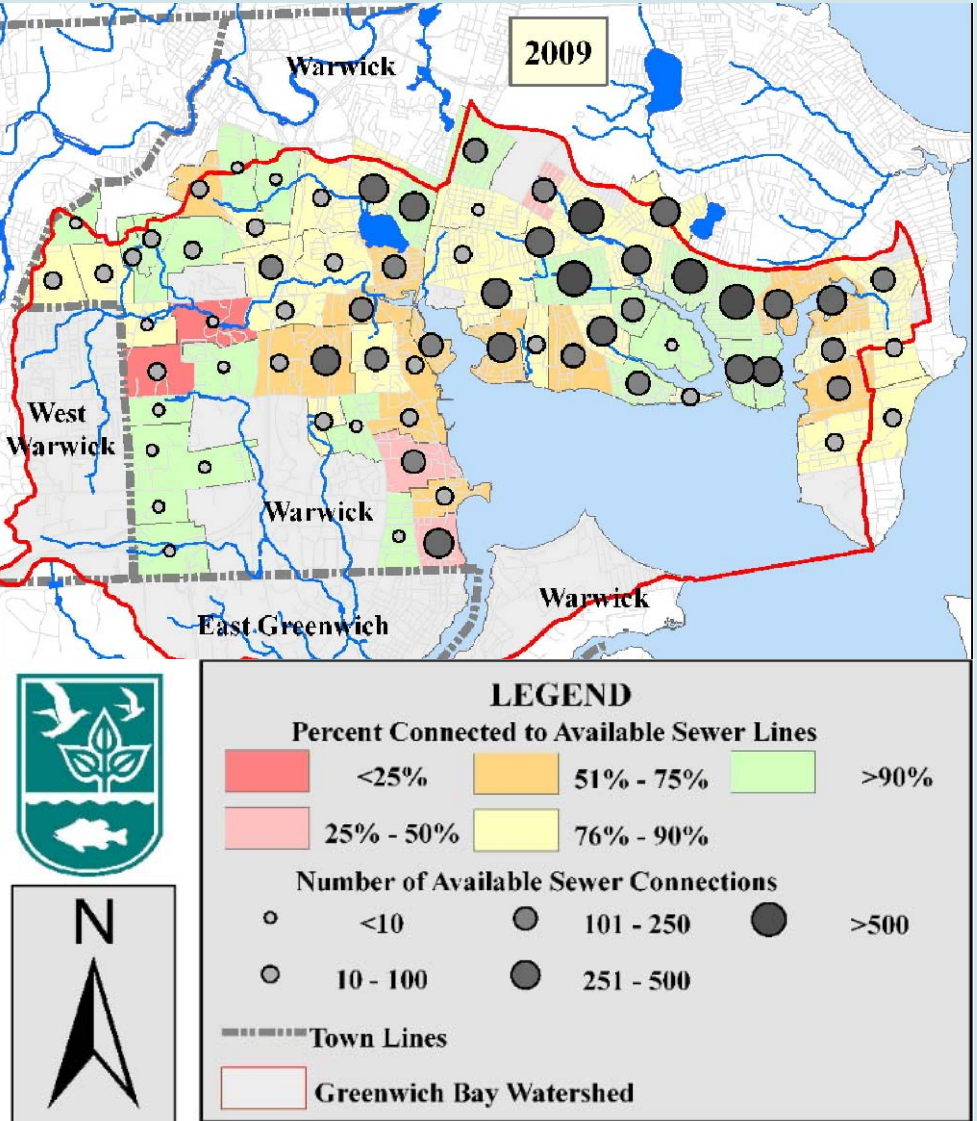
Ongoing Pollution Abatement Efforts
Nutrient Reduction Strategy

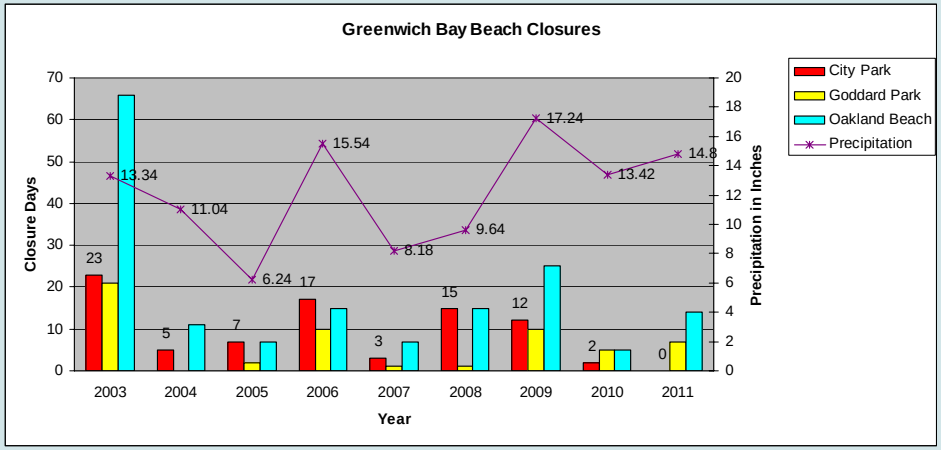
- **Narragansett Bay - upgrades at 11 WWTFs to reduce nitrogen load in various stages of planning/design/construction**
- **Major Rivers – upgrades to reduce phosphorus loads to technology limit of 0.1 mg/l TP**

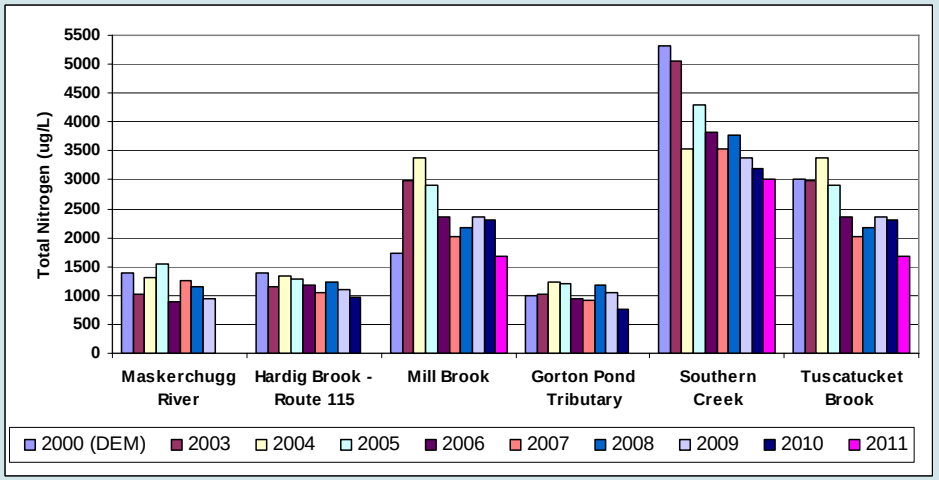


All calculations are based on May-Oct 95-96 WWTF flows. Loadings will increase as WWTF flows increase to their approved design flows.

Ongoing Pollution Abatement Efforts Greenwich Bay







Ongoing Pollution Abatement Efforts
Mt. Hope Bay

- **Fall River CSO Control Tunnel & other structures – 2009**
  - 2012-2016 Screening and Disinfection or Sewer Separation at 3other CSOs
- **Brayton Point Station: Natural Draft Cooling Towers - 2012**

Ongoing Water Quality Restoration Efforts

DEM works with partners to restore water quality through:

- **WQ based discharge limits and other regulatory actions**
- **investigative work to pinpoint pollution sources**
- **technical assistance to cities/towns in implementing stormwater controls & habitat improvements**
  - **Blackstone/Ten Mile bi-state stormwater coordinator**
- **Stormwater Utility District feasibility studies:**
  - **Westerly, Middletown, Bristol**
- **Watershed Plans:**
  - **Barrington-Palmer-Warren**
  - **Bristol and Kickemuit River**
- **grants to finance pollution controls**

Send Comments on draft 2012 303(d) list to:

Elizabeth Scott, Deputy Chief of Water Quality & Standards
DEM/Office of Water Resources
235 Promenade Street, Providence, RI 02908
elizabeth.scott@dem.ri.gov

View or download the draft 2012 303(d)list:

http://www.dem.ri.gov/programs/benviron/water/ quality/index.htm

Comments accepted through June 26, 2012


Water Quality Standards
Monitoring
Assessment
INTEGRATED REPORT
303d List
TMDLs
Permit Limits & NPS Controls
Compliance & Enforcement
Public Participation


RESTLESS
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