

# EPA Region One Perspective

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EPA Region 1

National Priorities Nutrient Management Kickoff Meeting

Narragansett, Rhode Island

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# Clean Water Act

## reducing nutrients

Water Quality Standards Nutrient criteria Development

TMDLs and assessments (Lake Champlain, Cape Cod + Long Island Sound)

NPDES and water quality effluent limits (Great Bay, Taunton River, MWRP)

Connecticut DEEP Phosphorous Strategy

Stormwater programs (MS4s) and S. 319 Funding

Large Geographic Programs (Cape Cod, Narragansett Bay, National Estuaries Program) and SNECWRP

ORD and Science work



# Water Quality Standards and Nutrient Criteria

- **Vermont 2015-** Added statewide numeric integrated standard that contain phosphorous for lakes and high and medium-gradient streams to WQS that already include site-specific TP criteria for Lake Champlain and Lake Memphremagog
- **Maine 2013** Proposed TP and nutrient response indicators for all lakes and wadeable streams

## WQS and Nutrient Criteria Going forward

- Help with nutrient criteria for large rivers and estuaries as well as developing primary productivity measures/methods for streams.
- Nitrogen/phosphorous relationship

# CWA Basis and NPDES Permitting for Nutrients

Approved TMDL? If yes, use WLA

If no, is there a reasonable potential (on both the point and NPS front) to cause or contribute to an excursion above WQS?

If yes, set WQ-based effluent limits

## Typical Steps

Establish target effects-based location and concentration

If there is no numeric criteria - "EPA's legal obligation to ensure that NPDES permits meet all applicable water quality standards, including narrative criteria, cannot be set aside while a state develops (numeric) water quality standards."

Estimate relative contributions among sources to the location

Allocate by designating or assuming reductions for the various sources

Set enforceable specifics (e.g., averaging, seasons, schedule)

# NPDES Nutrient Effluent Limit Examples

Blackstone River Watershed/Narragansett Bay TP &  
TN

## Great Bay Watershed

Integrated nutrient framework for stormwater + NPDES  
discharges

Testing in some of Great Bay

## Taunton River Watershed/Mount Hope Bay

Bay impaired by nitrogen

Dischargers will be required to reduce nitrogen

Limits to be established using Great Bay approach

Coastal Harbors and Bays (Plymouth and Aucoot Bay,  
MA)

Long Island Sound 2001 TMDL, 1990 Baseline

# Water quality requirements for MS4 permits

## Discharges to impaired waters ...

### without approved TMDL

- Development of a water quality response plan
- Adaptive management

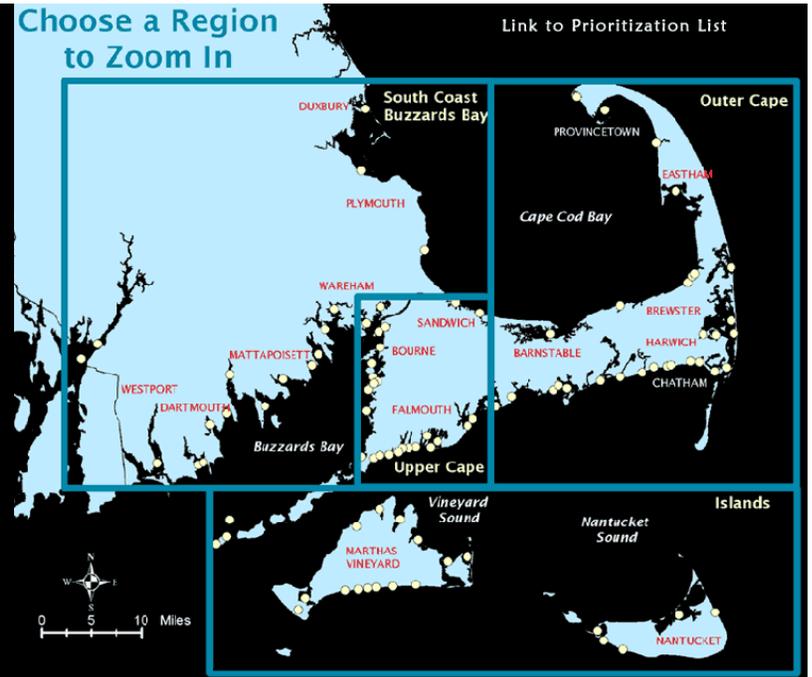
### with an approved TMDL

- Approved NH TMDLs - chloride, bacteria and phosphorus
- Approved MA TMDLs - bacteria, phosphorus and nitrogen
- Inclusion of requirements to address the TMDL- salt reduction plan; illicit detection and education, and phosphorus reduction plan

Cape Cod TMDL  
uses nutrient targets  
to try to reduce  
nutrient loadings

Cape 208 Planning

<http://www.oceanscience.net/estuaries/estuary.php?name=West+Falmouth+Harbor>



# New England National Estuary Programs focus on reducing nitrogen

Long Island Sound Study TMDL for nitrogen

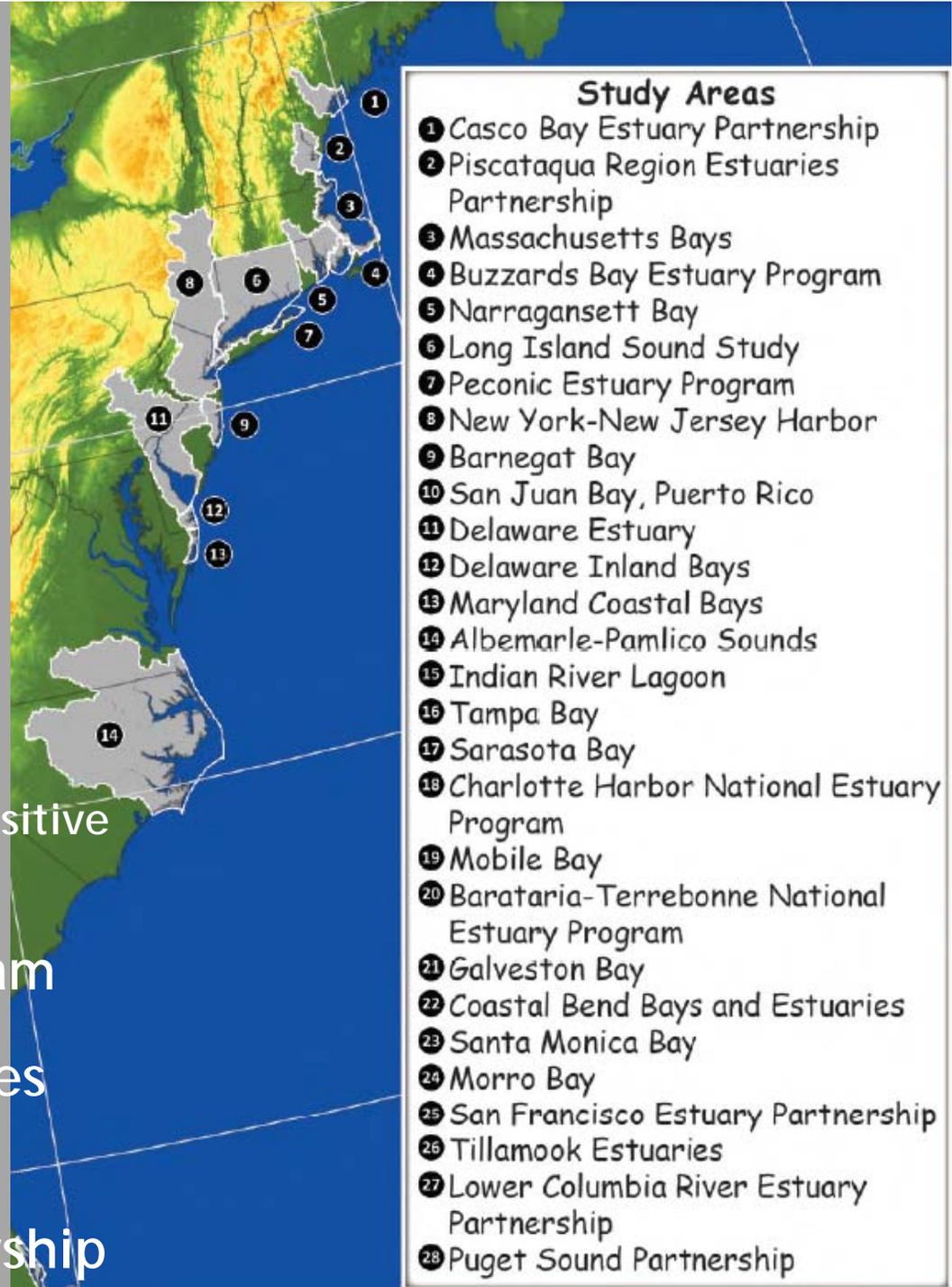
Narragansett Bay Estuary Program

Buzzards Bay CCMP actions on managing nutrient sensitive embayments

Massachusetts Bays Program

Piscataqua Region Estuaries Partnership

Casco Bay Estuary Partnership



# SE New England Coastal Watershed Restoration Program

Partnership to protect and restore coastal area from Westerly, RI to Chatham, MA

Innovative approaches to restore coastal ecosystems

\$2M in FY14 -focus on nutrients for year 1 with most funding as grants through the Narragansett Bay and Buzzards Bay Estuary Programs and EPA contracts for 1-2 projects on Cape Cod

\$5M in FY15 President's Budget

# EPA Region 1 working with ORD

## WMOST

(Watershed Management Optimization Support Tool)



**Watershed Management Optimization Support Tool (WMOST) v1**  
Original model created in 2007 and documented in Zolay et al. 2010. Additional development sponsored by EPA 2011 through 2013. Contact for questions: Viktora Zolay, Abt Associates, Inc. 617-520-2721, viktora\_zolay@abtasoc.com  
Compatible with Microsoft Excel 2010 © Please refer to the Theoretical Documentation and User Guide with Case Studies before using the model to understand its uses and limitations.  
Please report software errors to Harris Deterbeck, deterebeck.harris@epa.gov, with the subject "WMOST bug". To register for notices of patches and new releases, email deterebeck.harris@epa.gov with the subject "WMOST register".

**INPUT DATA**

1. Enter the number of HRU types in your study area and the number of land management options you will model. Please refer to the User Guide for an explanation of HRUs and HRU sets.  
Number of HRU Types:  Number of HRU Sets (baseline plus management sets):

2. Press "Setup 1" button to prepare input tables for land use, runoff, and recharge data.

3. Input values for the following data categories. Press the button to navigate to the input screen then return to the Main screen and check the box if all data are input for that category.  
 Land Use  Runoff  Recharge

4. Enter the number of water user types. Do not include unaccounted water demand as water user type; it is automatically included. Number of Water User Types:

5. Press "Setup 2" button to prepare input tables for potable and nonpotable demand and septic systems data.

6. Input values for the following data categories. Press the button to navigate to the input screen then return to the Main screen and check the box if all data are input for that category.  
 Potable Demand  Nonpotable Demand  Demand Management  Septic Systems

7. Input values for the following data categories. Press the button to navigate to the input screen then return to the Main screen and check the box if all data are input for that category.  
 Surface Water & In-Stream Flow Targets  Groundwater  Interbasin Transfer  Infrastructure

8. Enter measured in stream flow data  Measured Flow

**RUN OPTIMIZATION**

Ready | Main



US EPA ORD/NHEERL/Atlantic Ecology Division  
EPA Region 1 and Abt Associates (contractor)

WMOST 1.0 Download Page | Exposure Assessment Models | US EPA - Windows Internet Explorer provided by EPA

http://www2.epa.gov/exposure-assessment-models/wmost-10-download-page

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# WMOST 1.0 Download Page

## Specifications

### Software Specifications

Current version	V 1.0
Release date	December 2013
Development Status	General Release
Development Information	Release notes - changes and known deficiencies
Operating System	Windows
Development Language	Excel 2010 with Macros

## Download Files

### Documents

Document	Description
<a href="#">WMOST Theoretical Documentation</a>	PDF, 50pp, 1436KB
<a href="#">WMOST User Guide</a>	PDF, 68pp, 2502KB

### Files

File Name / Size / Format	File Description
<a href="#">WMOST v1 Excel 2010</a> (1 pg, 25 MB)	WMOST tool with blank input and output tables
<a href="#">LP-Solver</a> (1 pg, 196 KB) <a href="#">Zip file containing DLL</a>	WMOST LP-Solver. Extract into the same folder as the WMOST Excel file.
<a href="#">WMOST Upper Ipswitch</a> (1 pg, 23 MB)	WMOST tool with Upper Ipswitch watershed

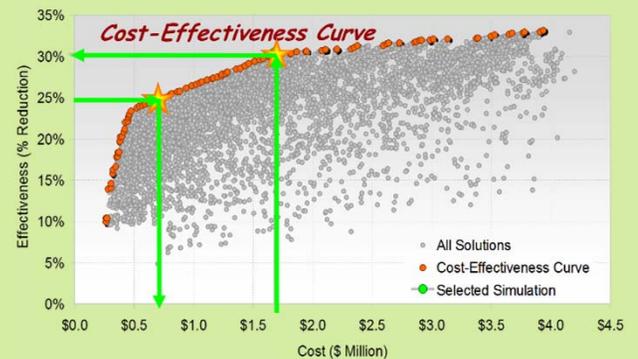
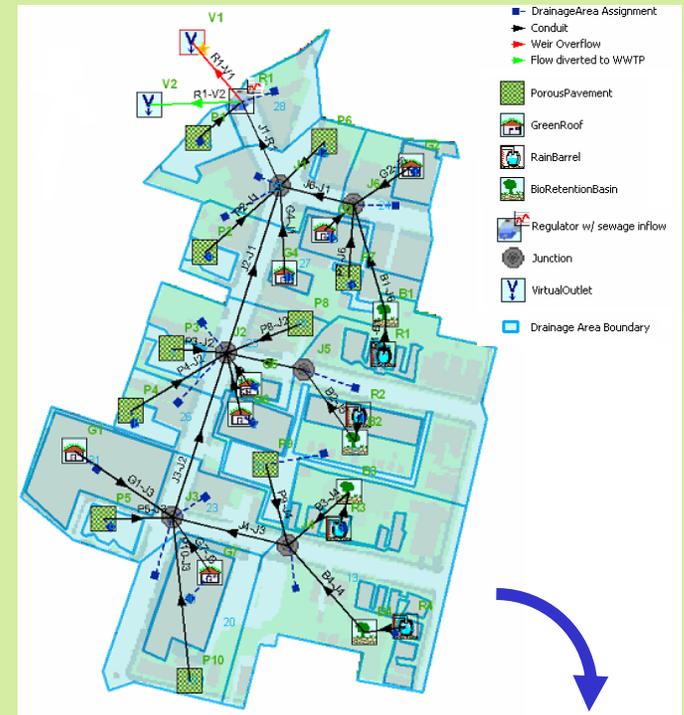
# Region 1 RARE FY2014 funded Enhancements to the WMOST: AED & Region 1

Create an updated version of WMOST to explore effect of climate variability and climate change on cost-benefit analyses and optimum solutions for IWRM in the Taunton Basin, MA

Modify WMOST to allow comparison of optimization solutions for wet and dry years - explore approaches for incorporating peak flow scenarios into WMOST

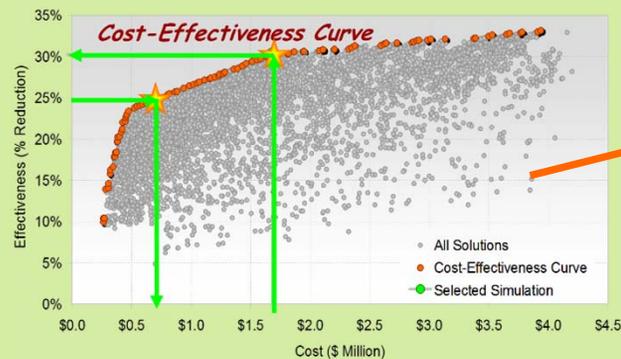
# An Excel-Based BMP Optimization Tool (Opti-Tool)

- ▶ Proven benefits of optimization techniques in stormwater management
- ▶ Existing EPA SUSTAIN model
  - ▶ BMP simulation
  - ▶ BMP optimization
  - ▶ *Link to WMOST*
  - ▶ **ArcGIS environment**
  - ▶ **Steep learning curve**



# Opti-Tool Post-processing capabilities

- ▶ Display of cost-effectiveness curve
  - ▶ Total BMP costs versus corresponding benefits
- ▶ Interpretation of the optimal solution
  - ▶ BMP sizing strategies across the watershed
  - ▶ Depth of runoff to be treated at individual subwatersheds



	BMP <sub>1</sub>	BMP <sub>2</sub>	...	BMP <sub>N-1</sub>	BMP <sub>N</sub>
Scenario #X	123	456	...	789	1011