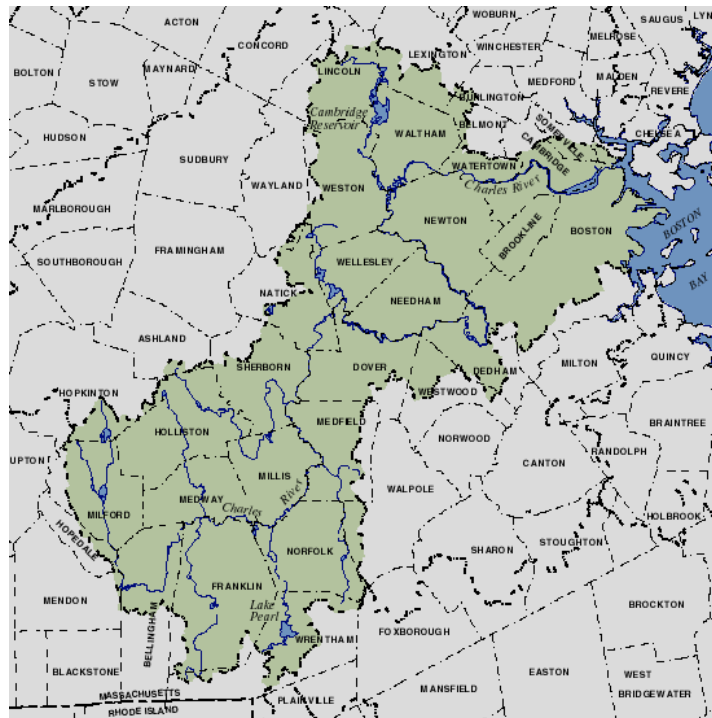


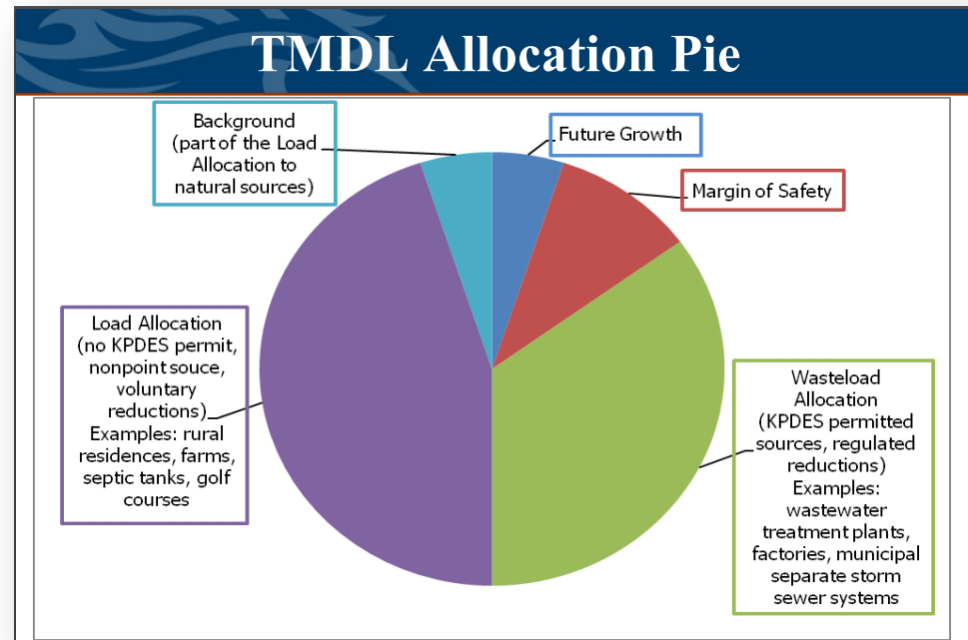
# Charles River Watershed

## Total Maximum Daily Load



# TMDL: Total Maximum Daily Load

- Pollution budget
- Required for impaired waters (under CWA)
- Identify sources and determine future discharge allocations



Source: TMDL 101, Andrea M. Fredenburg, Kentucky Division of Water, November 15, 2011

# Charles River TMDLs

- Final TMDL for Nutrients in the Upper/Middle Charles River
- Final Phosphorus TMDL Report for the Lower Charles River Basin
- Final Pathogen TMDL Reports for the Charles River Watershed

## Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River, Massachusetts

Control Number: CN 272.0



Prepared by:

Charles River Watershed Association  
190 Park Rd, Weston, MA 02453

Numeric Environmental Services, Inc.  
Beverly Farms, MA 01915

Prepared for:

Massachusetts Department of Environmental Protection  
627 Main Street, Worcester, MA 01608

United States Environmental Protection Agency, New England Region  
1 Congress Street, Boston, MA 02114-2023

May 2011

# Charles River TMDLs

- **Final TMDL for Nutrients in the Upper/Middle Charles River**
- **Final Phosphorus TMDL Report for the Lower Charles River Basin**
- Final Pathogen TMDL Reports for the Charles River Watershed

## Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River, Massachusetts

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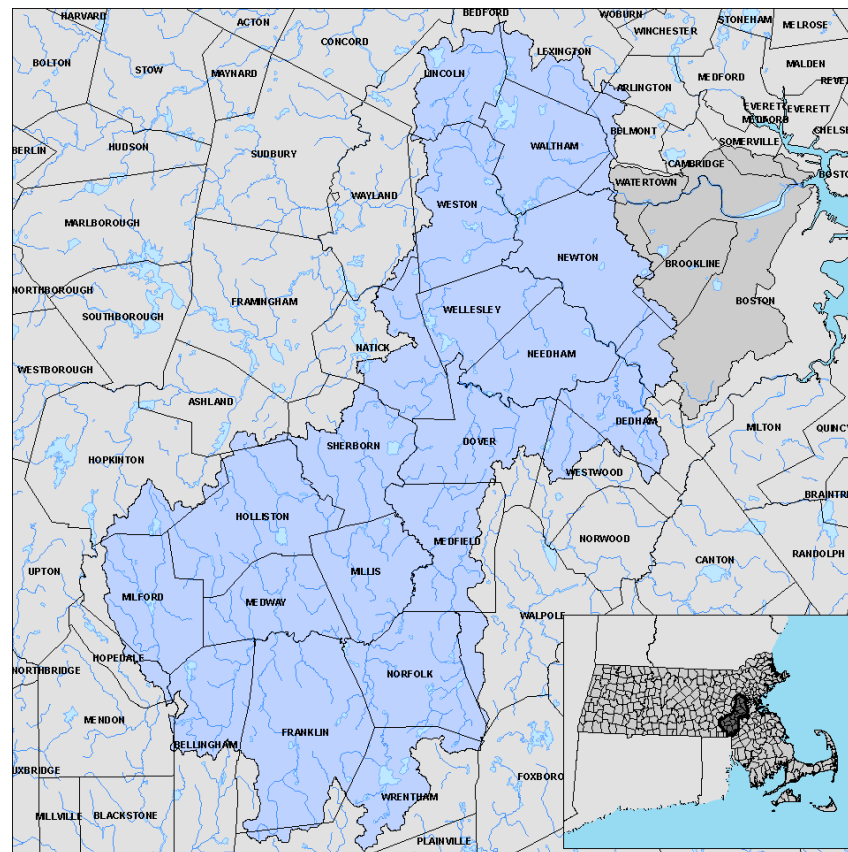
# Impacts of Nutrient Impairment in the Charles River

- Toxic cyanobacteria blooms
- Eutrophication
- Algae blooms
- Low dissolved oxygen
- High turbidity / poor light penetration
- Overgrowth of nuisance vegetation
- Recreational impacts
- Healthy impacts



# Pollutant Sources Identified

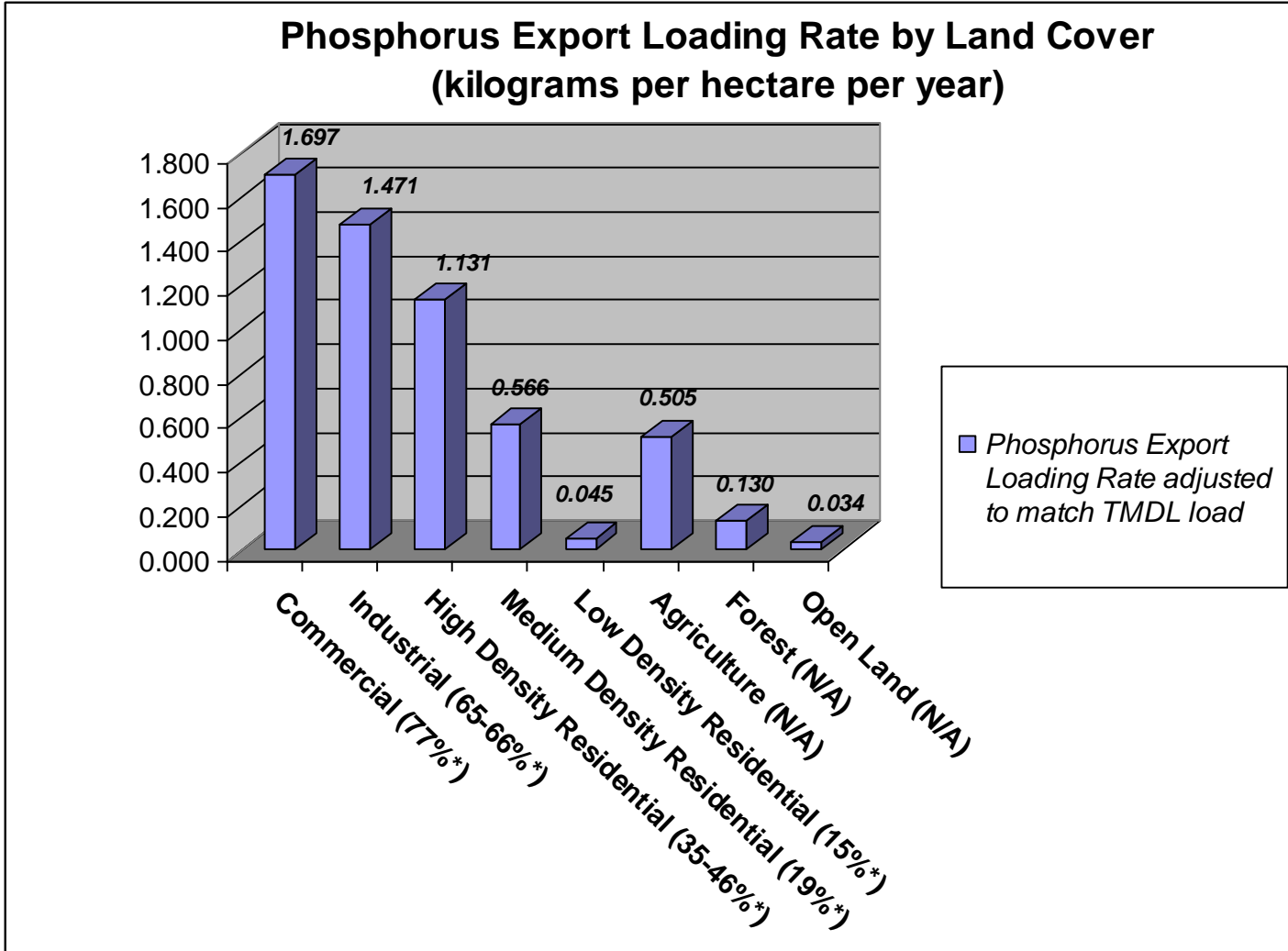
- Upstream Watershed of Watertown Dam
  - Storm Water discharges
  - Illicit Sanitary discharges
  - Wastewater Treatment Facilities
  - Nonpoint Sources
  - Natural Sources
- Discharges Directly to the Lower Charles
  - Storm Water discharges
  - Illicit Sanitary discharges
  - Combined Sewer Overflows
  - Nonpoint Sources



# Lower Charles River Phosphorus TMDL

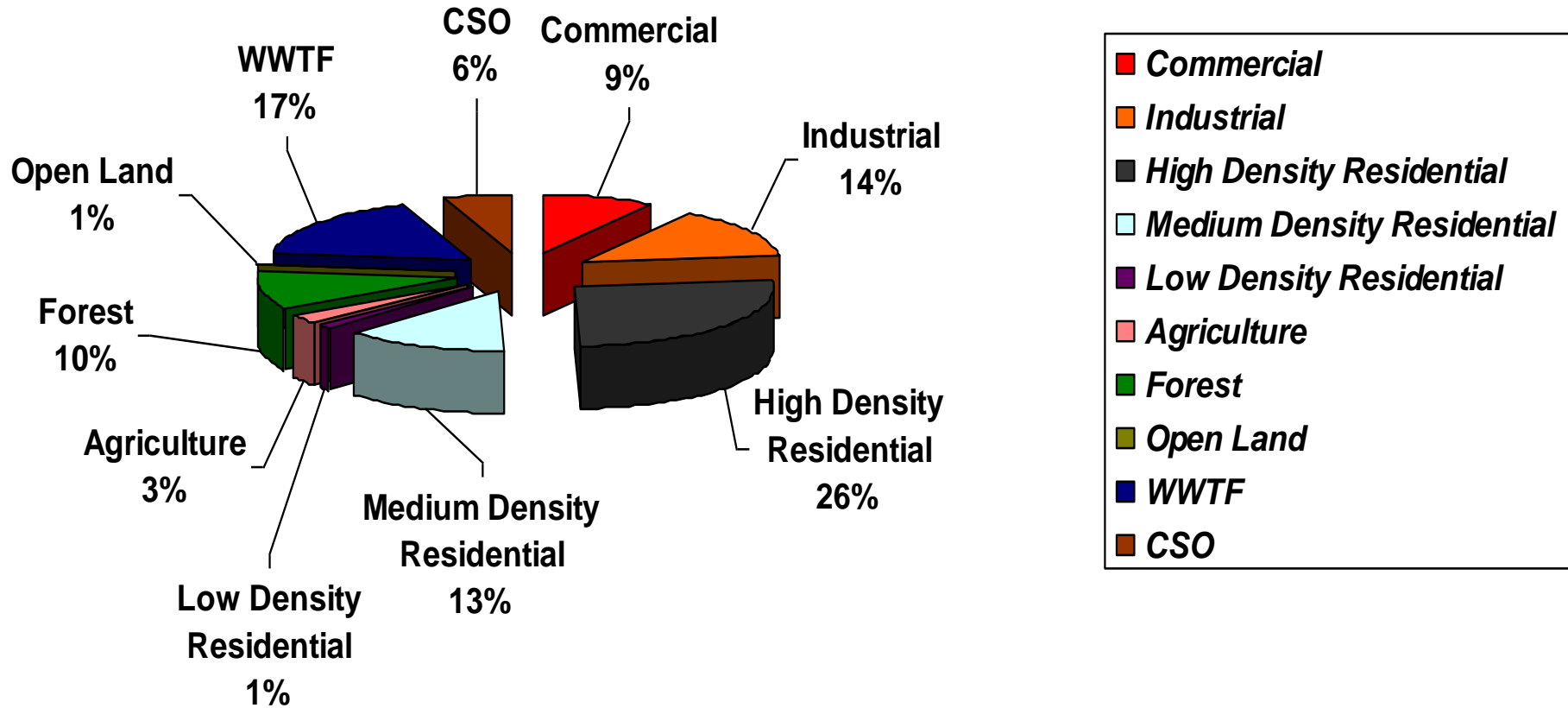


# Upper Charles Nutrient TMDL

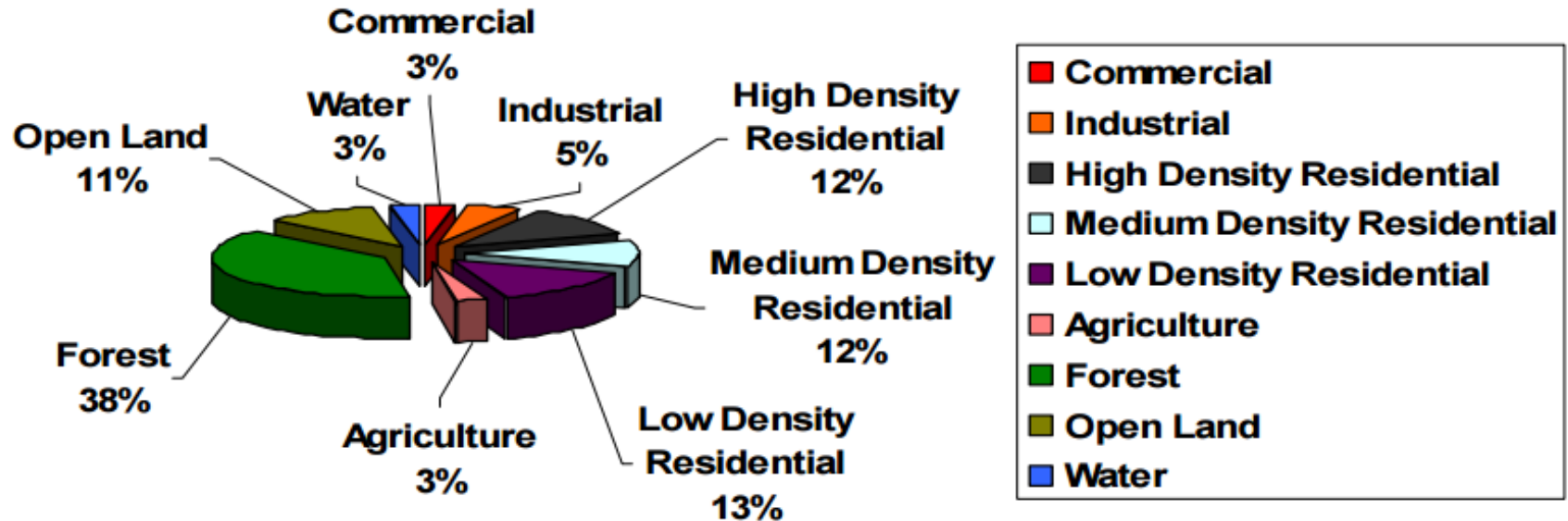




# Distribution of Annual Phosphorus Load to the Charles River by Source Category (1998-2002)



# Land Cover Distribution - Charles River Watershed



## Charles River Watershed - Allocation of allowable phosphorus load by source category based on TMDL for nutrients in the Lower Charles River (June, 2007)

Charles River Watershed	Commercial	Industrial	High Density Residential	Medium Density Residential	Low Density Residential	Agriculture	Forest	Open Land	WWTF	CSO	Total
Drainage Area (Acres)	5355	9612	22804	23050	27361	5095	76190	20818	N/A	N/A	190286
1998-2002 Conditions (kg/yr)	3676	5718	10437	5278	503	1042	4018	289	6825	2263	40050
TMDL Loading Scenario (kg/yr)	1268	1972	3600	1820	276	672	4018	187	4663	90	18565
Percent (%) Reduction in Phosphorus Loading	65%	65%	65%	65%	45%	35%	0%	35%	32%	96%	

Source: Final Total Maximum Daily Load for Nutrients in the Lower Charles River Basin, Massachusetts, CN 301.0, June, 2007



# Today's Agenda

- 8:30 - 9:00 Coffee and registration
- 9:00 - 9:15 Charles River TMDLs, *Julie Wood, CRWA*
- 9:15 - 10:00 Phosphorus control plans, *Nigel Pickering*
- 10:00 - 10:20 Green infrastructure implementation, *Pallavi Mande*
- 10:20 - 11:00 Municipal implementation, *Brutus Cantoreggi*
- 11:00 - 11:30 Municipal codes and low impact development, *Sam Cleaves, MAPC*
- 11:30 - 12:00 Stormwater coalitions, *Robin Craver, Town of Charlton* and *Aubrey Strause, Central Mass Stormwater Coalition*
- 12:00 - 1:00 Lunch and discussion (see questions on back of agenda)

Thank you all for coming!



# Discussion Questions

## **Phosphorus Reduction**

- *What has worked in your community? What has not worked?*
- *What are the major challenges you face in your community with respect to implementing phosphorus reduction measures (structural and non-structural controls)?*

## **Green Infrastructure (GI)**

- *What are the major challenges you face with respect to GI implementation?*
- *Are there challenges other than funding?*

## **Stormwater Coalitions**

- *Do you see this model having a role in the Charles River watershed? What is the right regional scale?*
- *Would your community be interested in taking part in a stormwater coalition?*

## **Public Education**

- *What role do you see this playing in your phosphorus reduction program? In overall compliance with the Charles River Nutrient TMDL?*
- *What successful examples have you either implemented in your community or heard about?*