

**Inter-municipal Watershed Planning and TMDL Implementation to Restore Embayment Water Quality on Cape Cod:**  
Three Case Studies of Towns Sharing Coastal Watersheds



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Prepared for and submitted to:  
The United States Environmental Protection Agency



# THE MASSACHUSETTS ESTUARIES PROJECT

## Restoring Embayment Water Quality in Southeastern Massachusetts

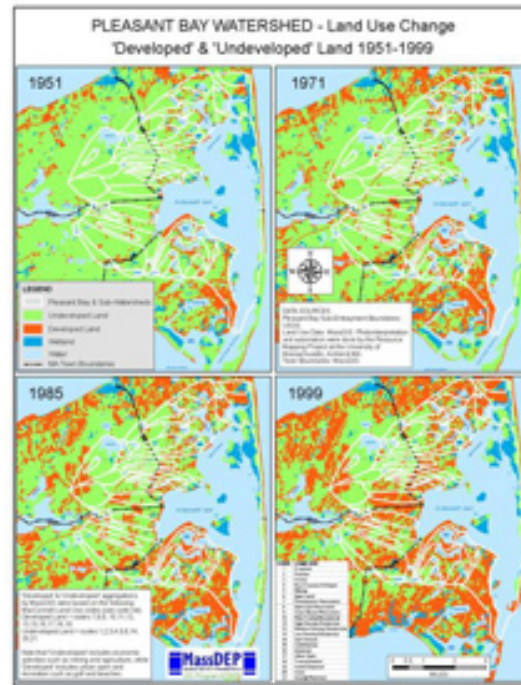
### MEP PILOT PROJECT: Three Case Studies of Towns Sharing Coastal Watersheds

**ISSUES:**

- \* Excessive nitrogen in estuaries
- \* Estuarine watersheds cover multiple towns
- \* Identify nitrogen sources by town
- \* Quantify nitrogen amounts by town
- \* Decrease nitrogen sources to restore water quality

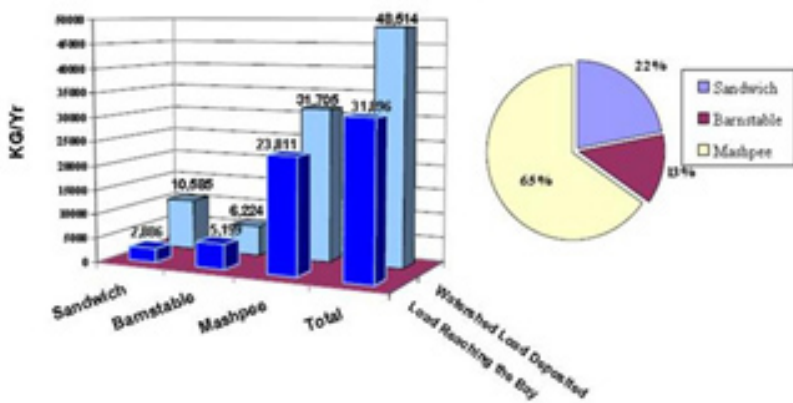


Evidence of excess nitrogen: decline in amount & distribution of eelgrass in estuaries

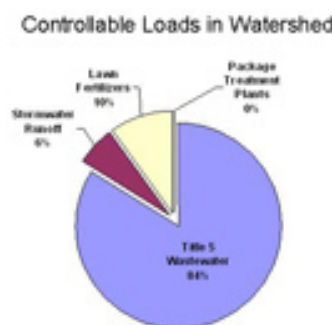


More developed land leads to increased wastewater loads

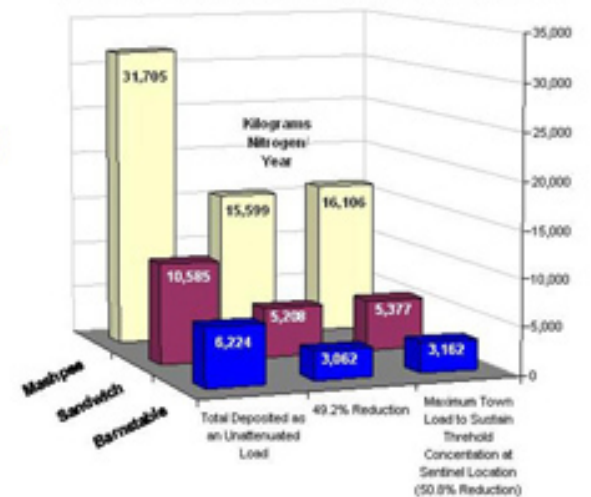
Unattenuated Nitrogen Load Deposited in the Watershed & Attenuated Nitrogen Load Reaching the Bay from Each Watershed Town



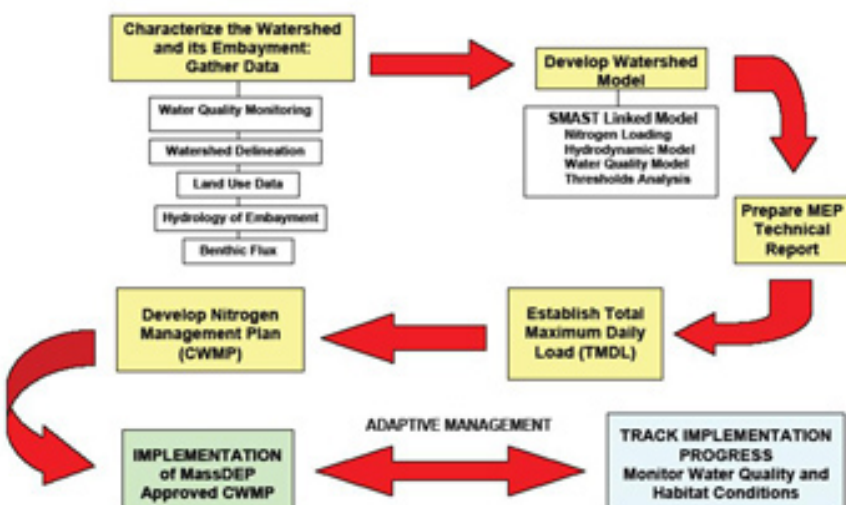
Nitrogen sources identified & quantified by town. Total Maximum Daily Loads (TMDL) established (Popponesset Bay Watershed)



Equal Percentage for Each Town of Nitrogen Reduction Deposited as an Unattenuated Load to the Watershed

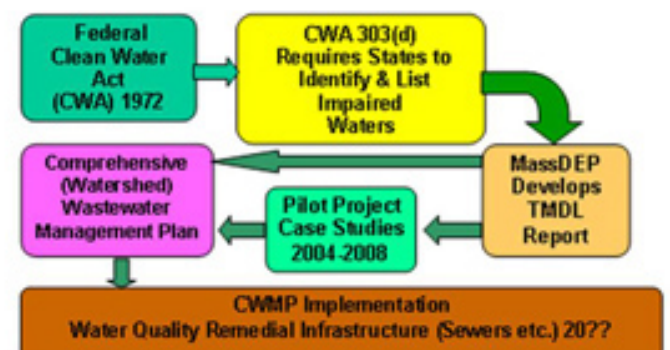


The Massachusetts Estuary Project Restoration Process



Towns use information gathered for wastewater management planning to achieve nitrogen load reductions necessary for restoring estuarine water quality

Diagram of Pilot Project Case Studies' Role in the Implementation of a TMDL



The Massachusetts Estuaries Project is being conducted jointly by the Massachusetts Department of Environmental Protection and the School for Marine Science & Technology at the University of Massachusetts Dartmouth, with assistance from the Cape Cod Commission and Applied Coastal Research & Engineering. The Pilot Project was funded by the U.S. Environmental Protection Agency.