

# Progress Report to the Board of Selectmen

Wastewater Management Validation &  
Design Committee

March 18, 2009

# BoS Charge to WMV&DC

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- Technical Review of Pleasant Bay Report
- Evaluate alternative technologies
- Act as “Building Committee”
- “to ensure..the wastewater project..is properly designed and constructed.
- Review Draft CWMP
- Assist Town Administrator

# Peer Review Status

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- Committee reviewed Pleasant Bay Report
- Determined four areas of uncertainty
  - Nitrogen input estimates
  - Benthic flux nitrogen [sediment generation]
  - “Linked-Model” hydrodynamics
  - Health of the benthic community in sediments
    - Eelgrass
    - Benthic animals

# Peer Review Team

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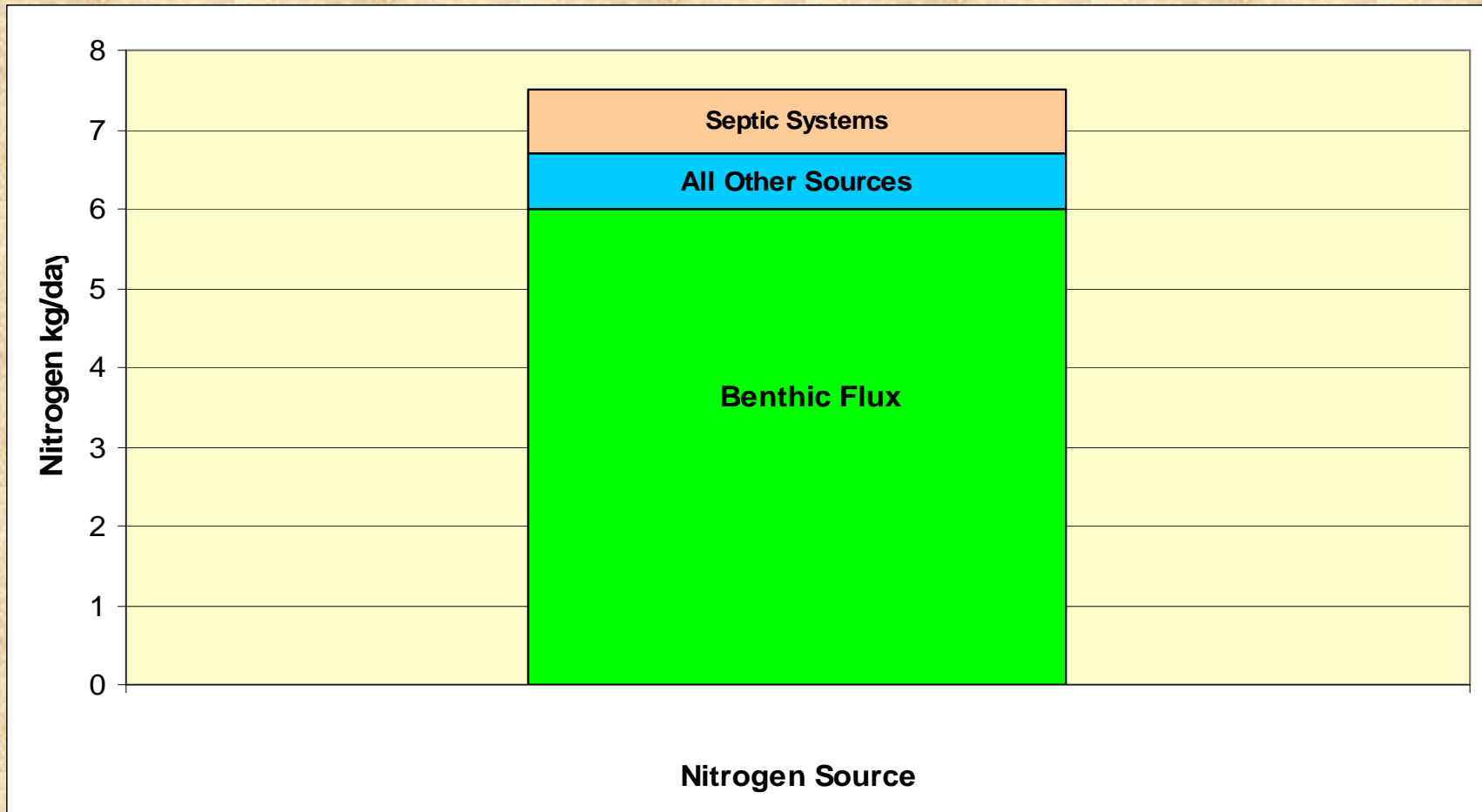
- Town received five excellent proposals
- Woods Hole Group (WHG) was selected
- WHG Team:
  - **Benthic Nitrogen** – Dr. Jeffrey Cornwell
  - **Hydrodynamic Model** - Kirk Bosma (WHG)
  - **Health of Benthic Community** – Dr. John Teal

# Four Areas of Uncertainty

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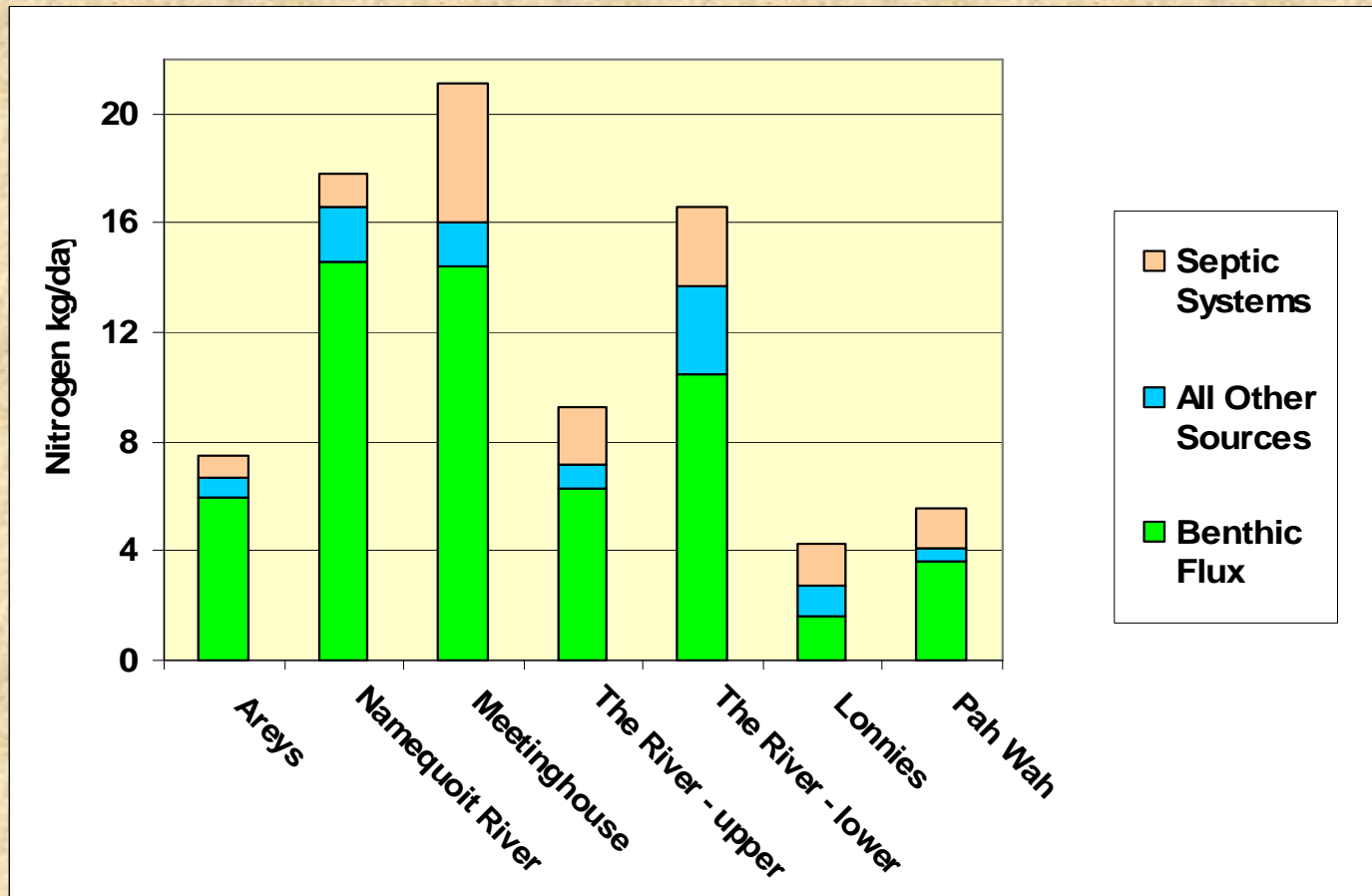
- **Nitrogen input estimates**
- **Benthic flux nitrogen [sediment generation]**
- **Linked-Model hydrodynamics**
- **Health of benthic communities in sediment**
  - Eelgrass
  - Benthic animals

# Areys Pond Nitrogen



[1] "Massachusetts Estuaries Project, Linked Watershed Model...Orleans, Chatham, Brewster and Harwich, Massachusetts", U. Mass. Dartmouth, SMAST, May 2006, Table ES-1a, page ES-11.

# Embayment Nitrogen Sources



[1] "Massachusetts Estuaries Project, Linked Watershed Model...Orleans, Chatham, Brewster and Harwich, Massachusetts", U. Mass. Dartmouth, SMAST, May 2006, Table ES-1a, page ES-11.

# Pleasant Bay System

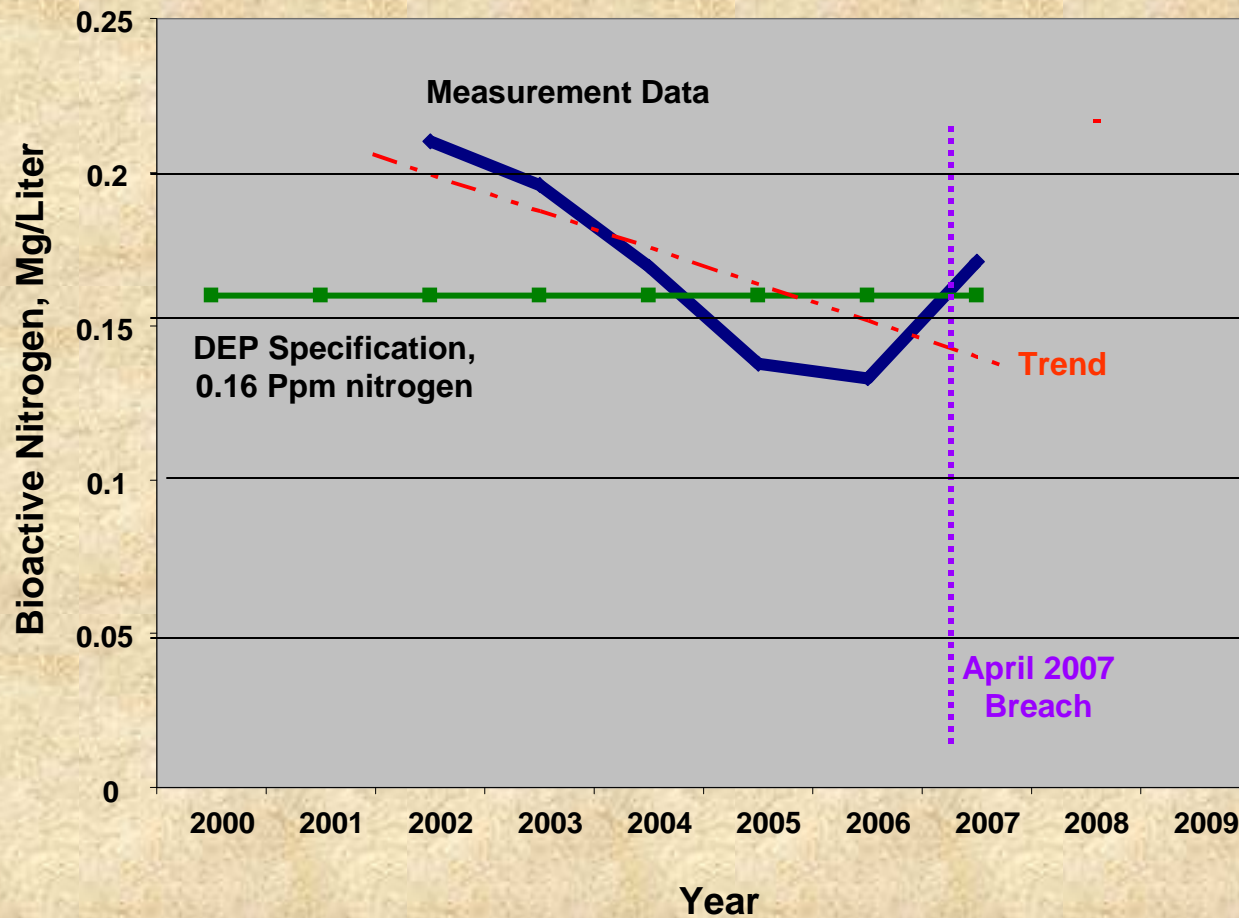
## Orleans



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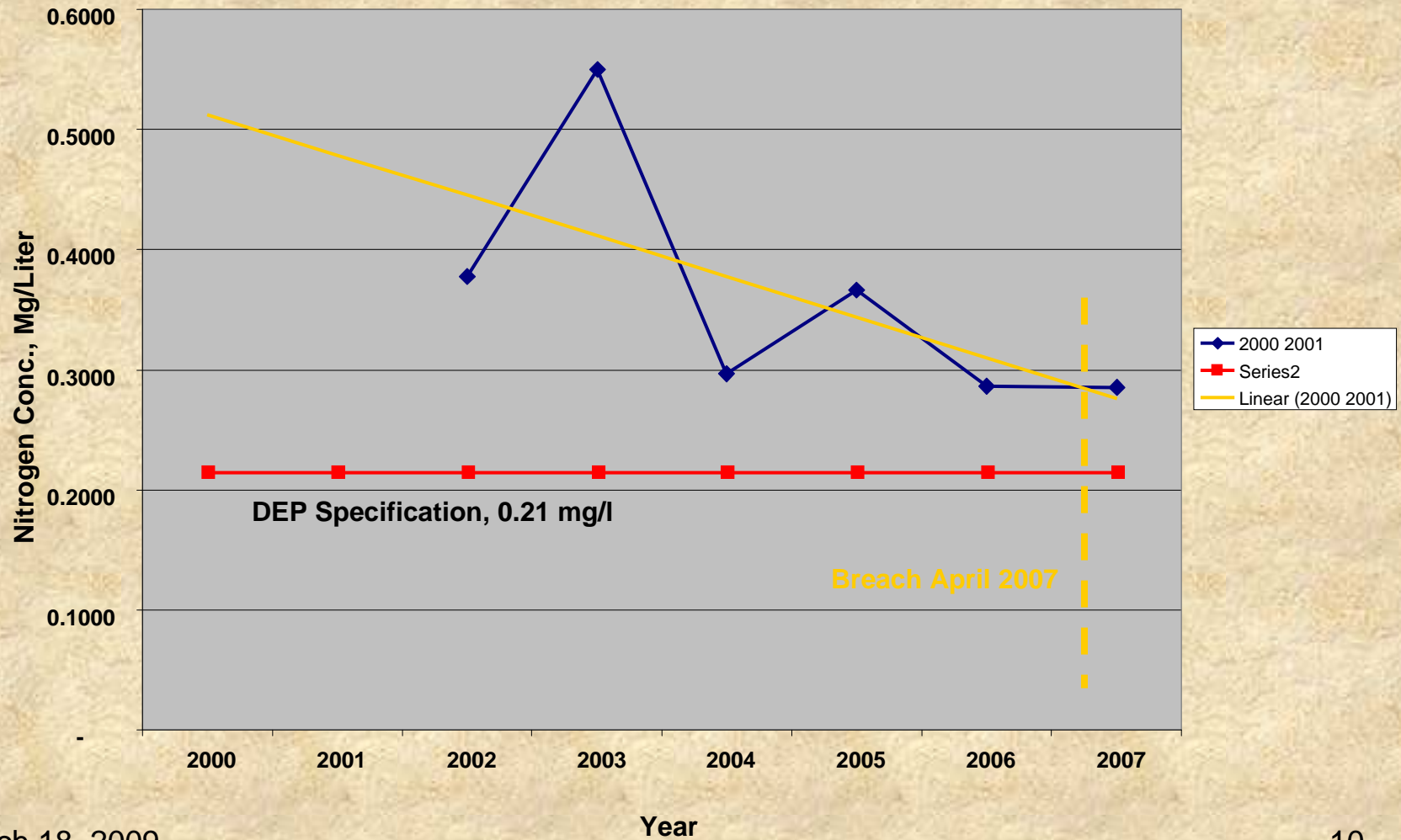
# PBA12 - Namequoit Point, Sentinel Station

## Bioactive Nitrogen Measurements



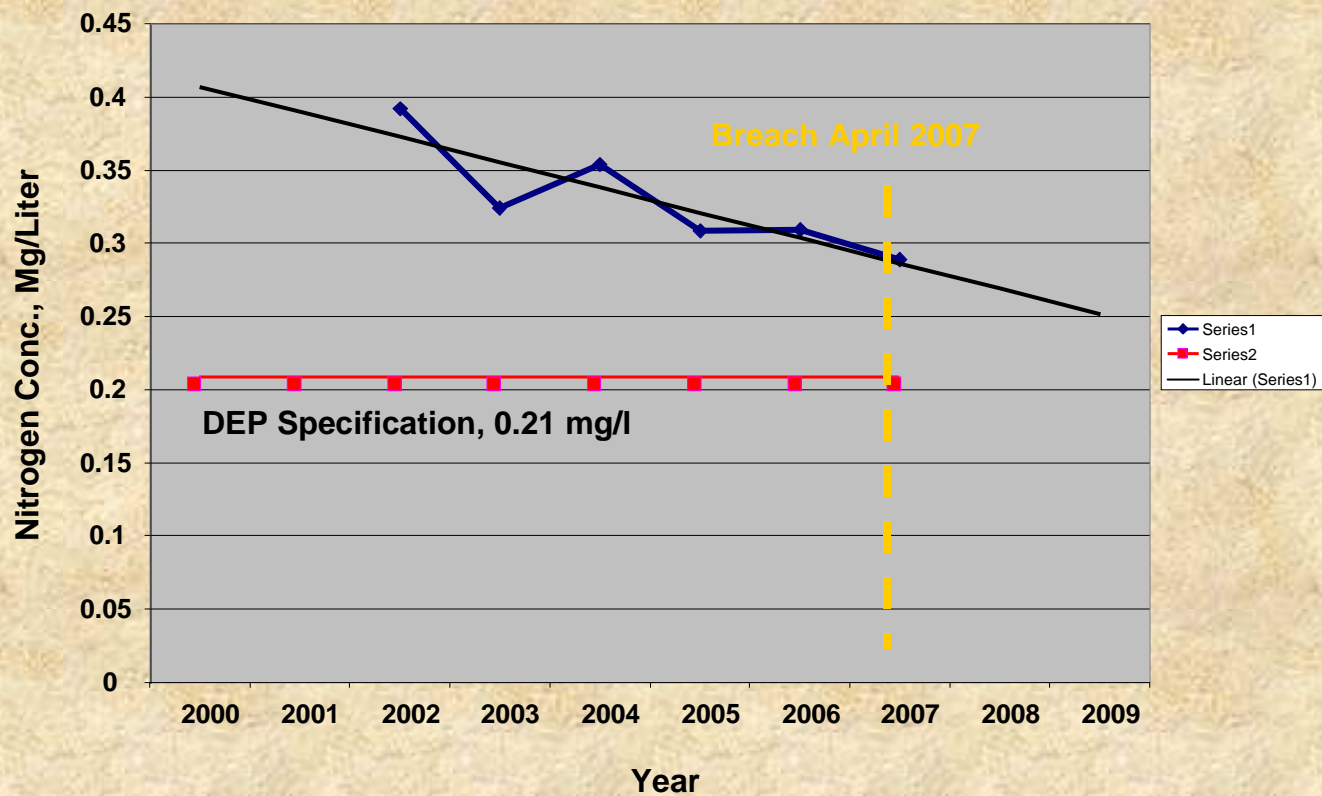
# Meetinghouse Pond

## Bioactive Nitrogen Measurements



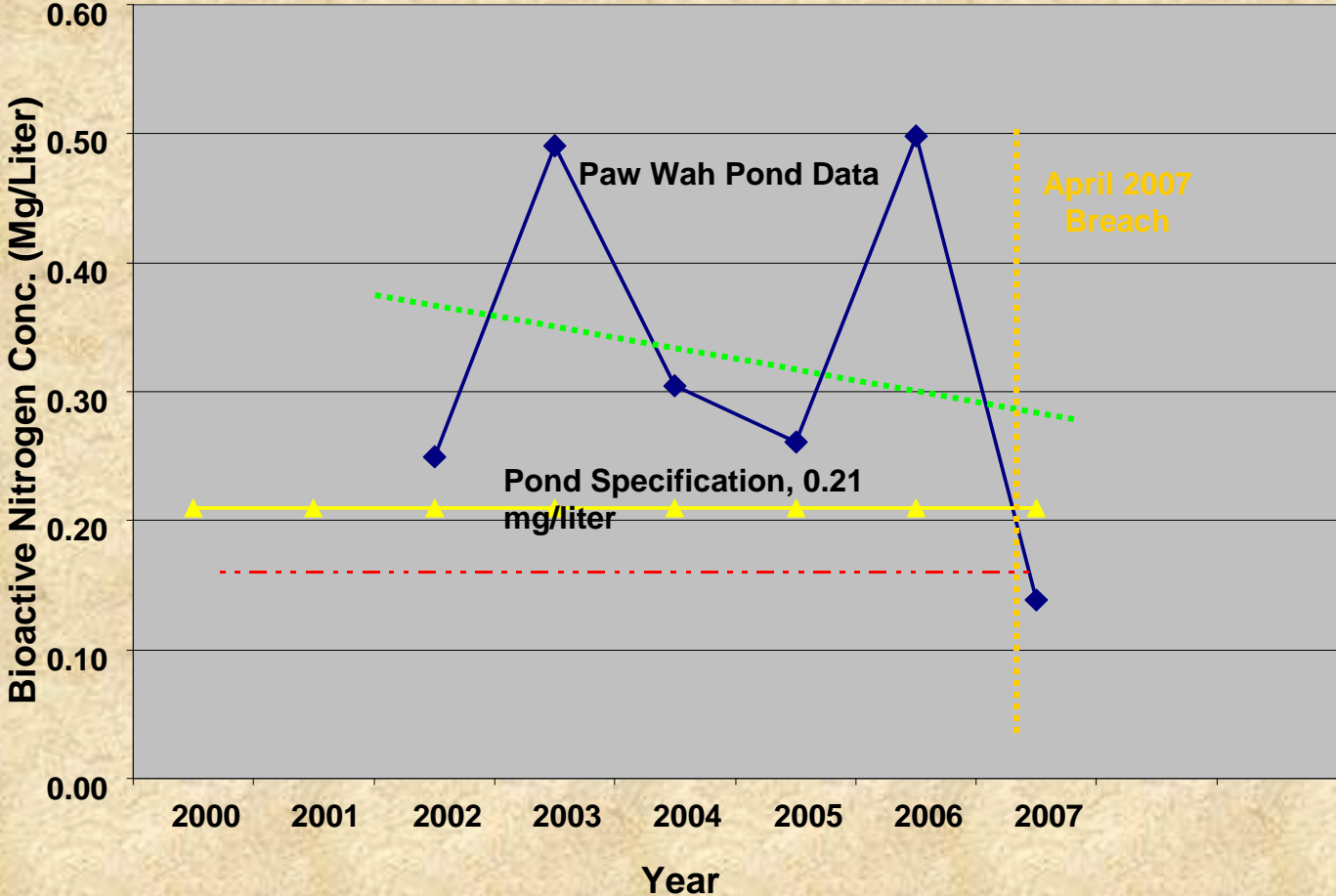
# "Lonnie's Pond"

## Bioactive Nitrogen Measurements



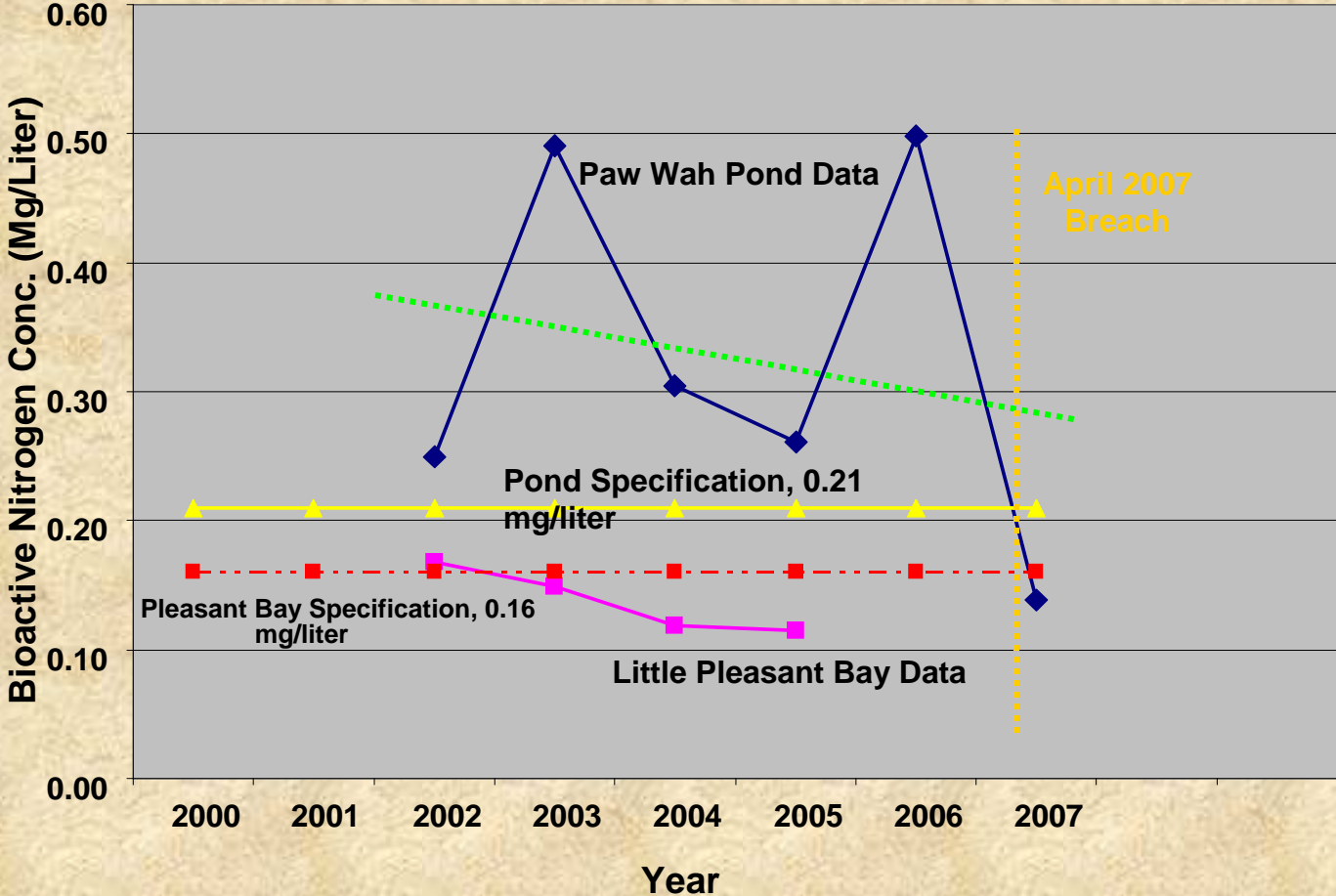
# Pah Wah Pond And Little Pleasant Bay

## Bioactive Nitrogen Measurements



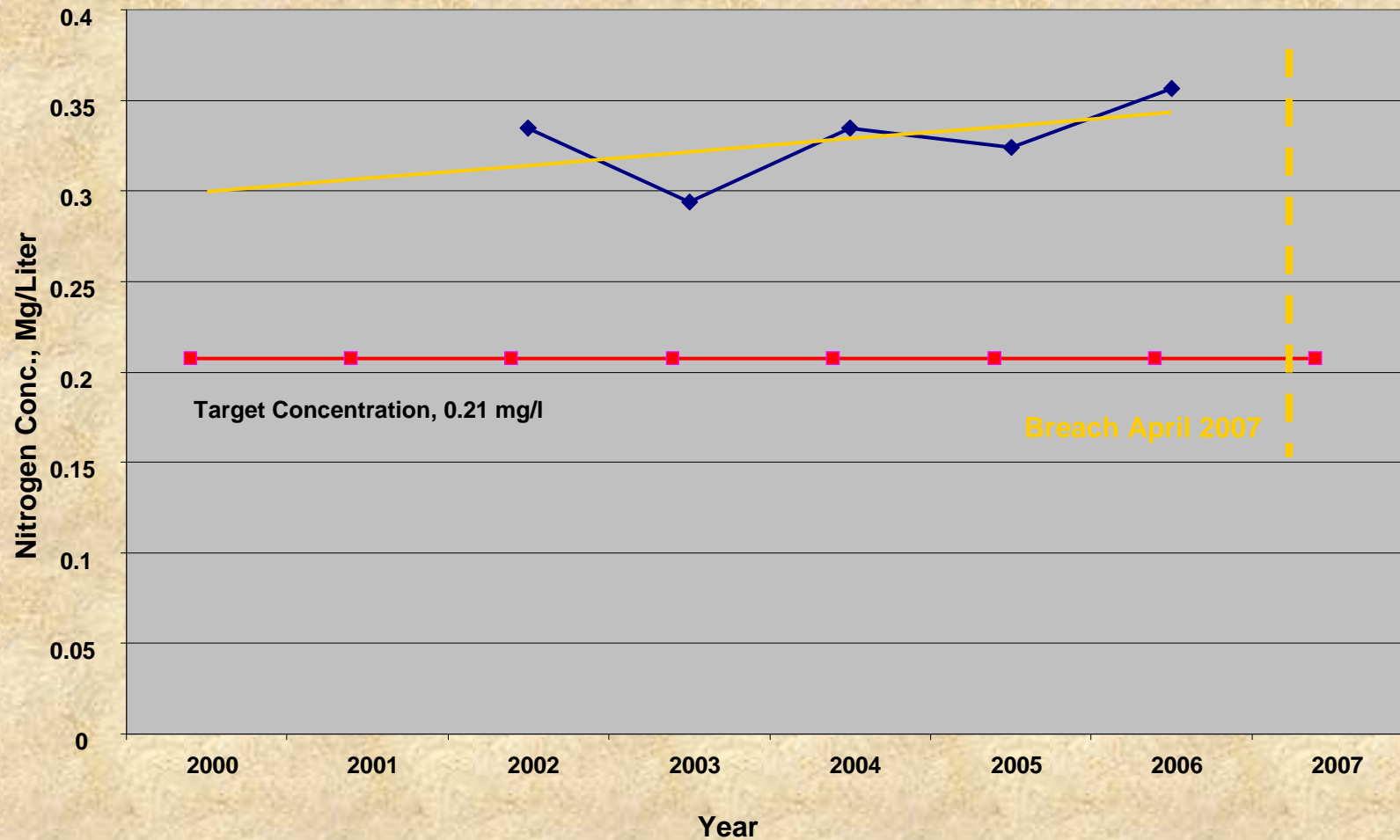
# Pah Wah Pond And Little Pleasant Bay

## Bioactive Nitrogen Measurements



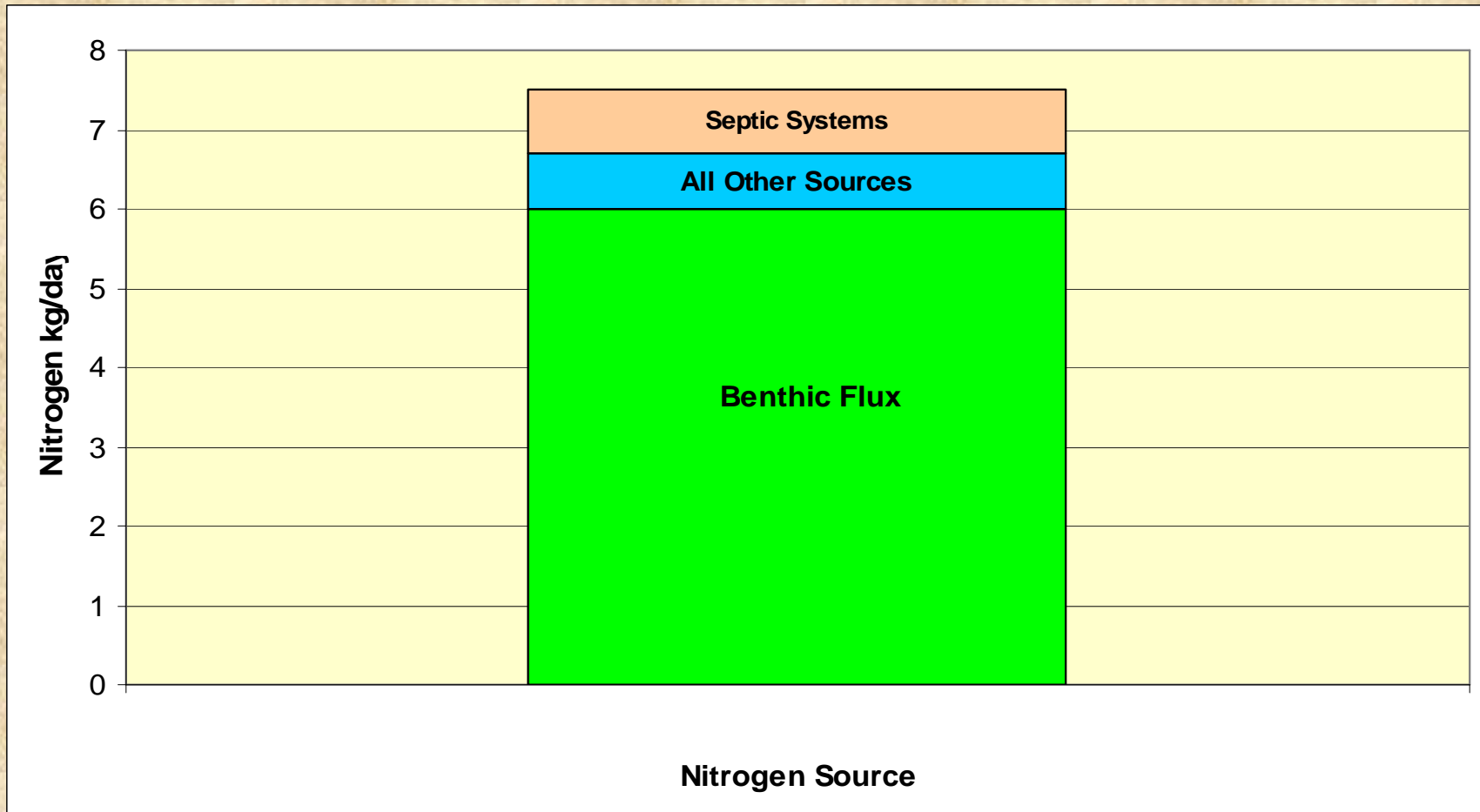
# Areys Pond

## Bioactive Nitrogen Measurements



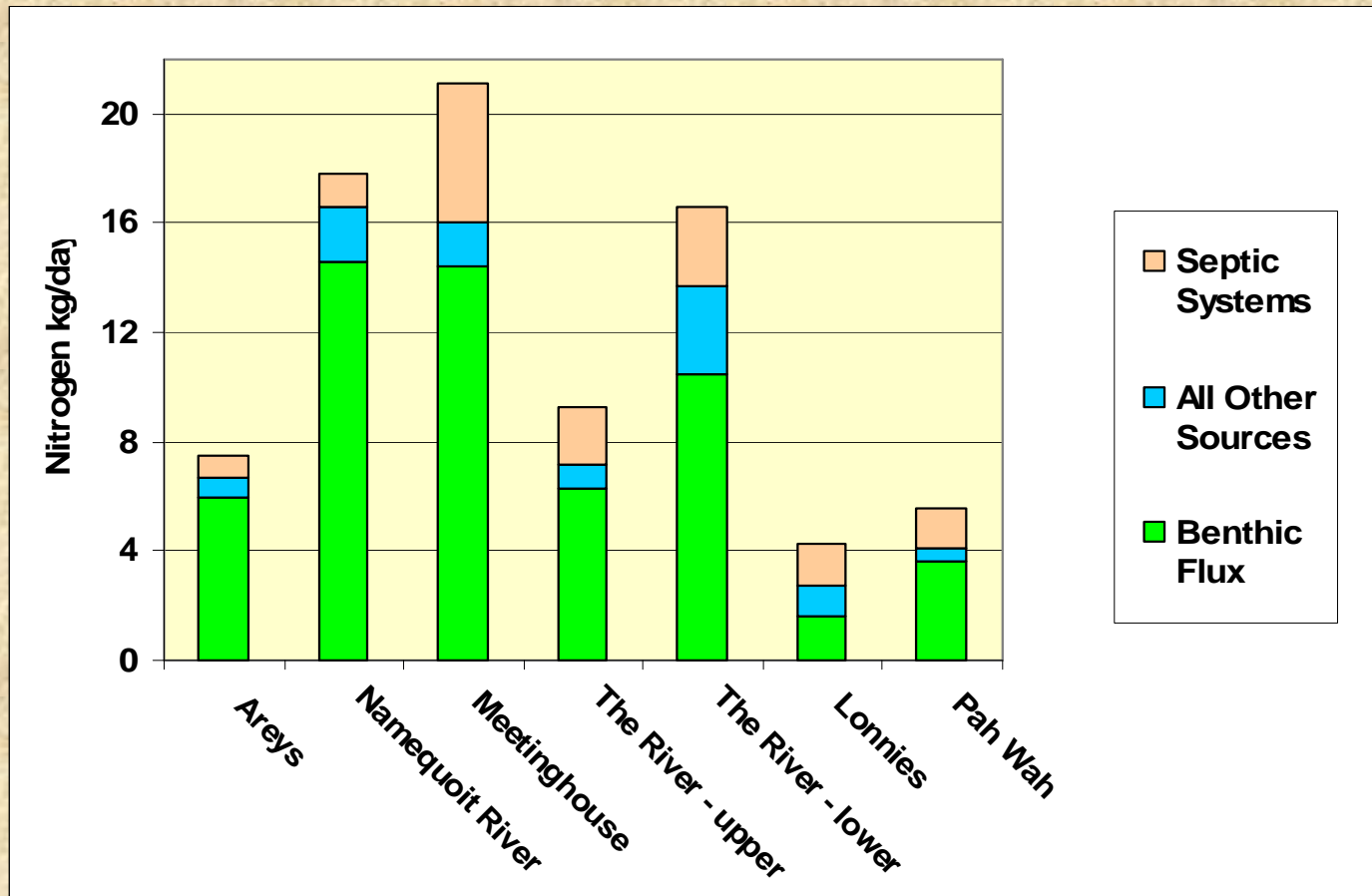
March 18, 2009

# Areys Pond Nitrogen



[1] "Massachusetts Estuaries Project, Linked Watershed Model...Orleans, Chatham, Brewster and Harwich, Massachusetts", U. Mass. Dartmouth, SMAST, May 2006, Table ES-1a, page ES-11.

# Embayment Nitrogen Sources



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# Summary of Findings to Date

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- Amount of septage nitrogen into Pleasant Bay may be overstated
- Nitrogen from Benthic Flux exceeds septage nitrogen
- Nitrogen levels in Pleasant Bay have been decreasing –not increasing in recent years
- The effect of the 2007 Breach not considered in DEP calculation of TMDL

# Making the Connection

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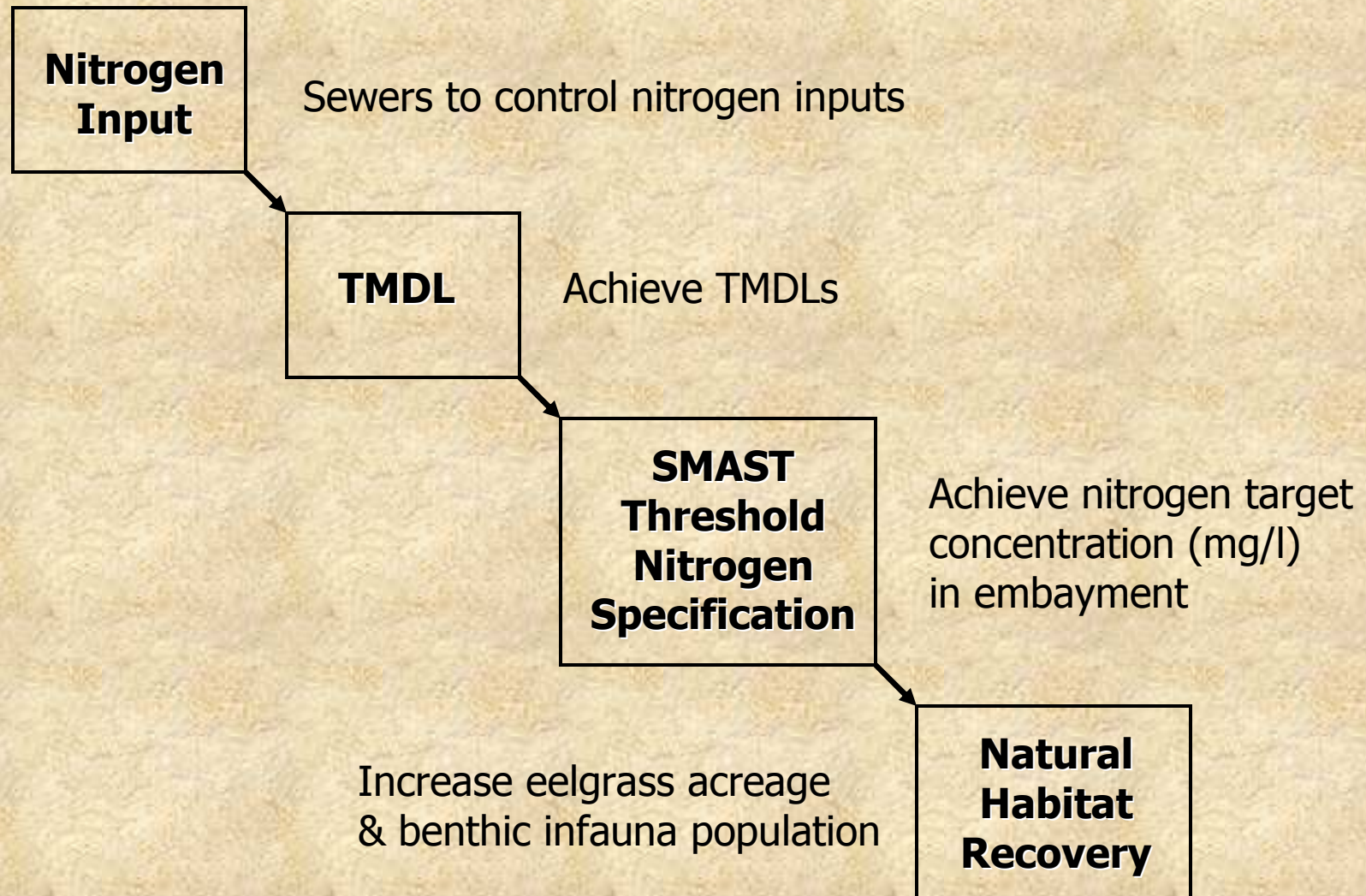
**Science**



**\$ Cost \$**

# Impact of Nitrogen Source Control?

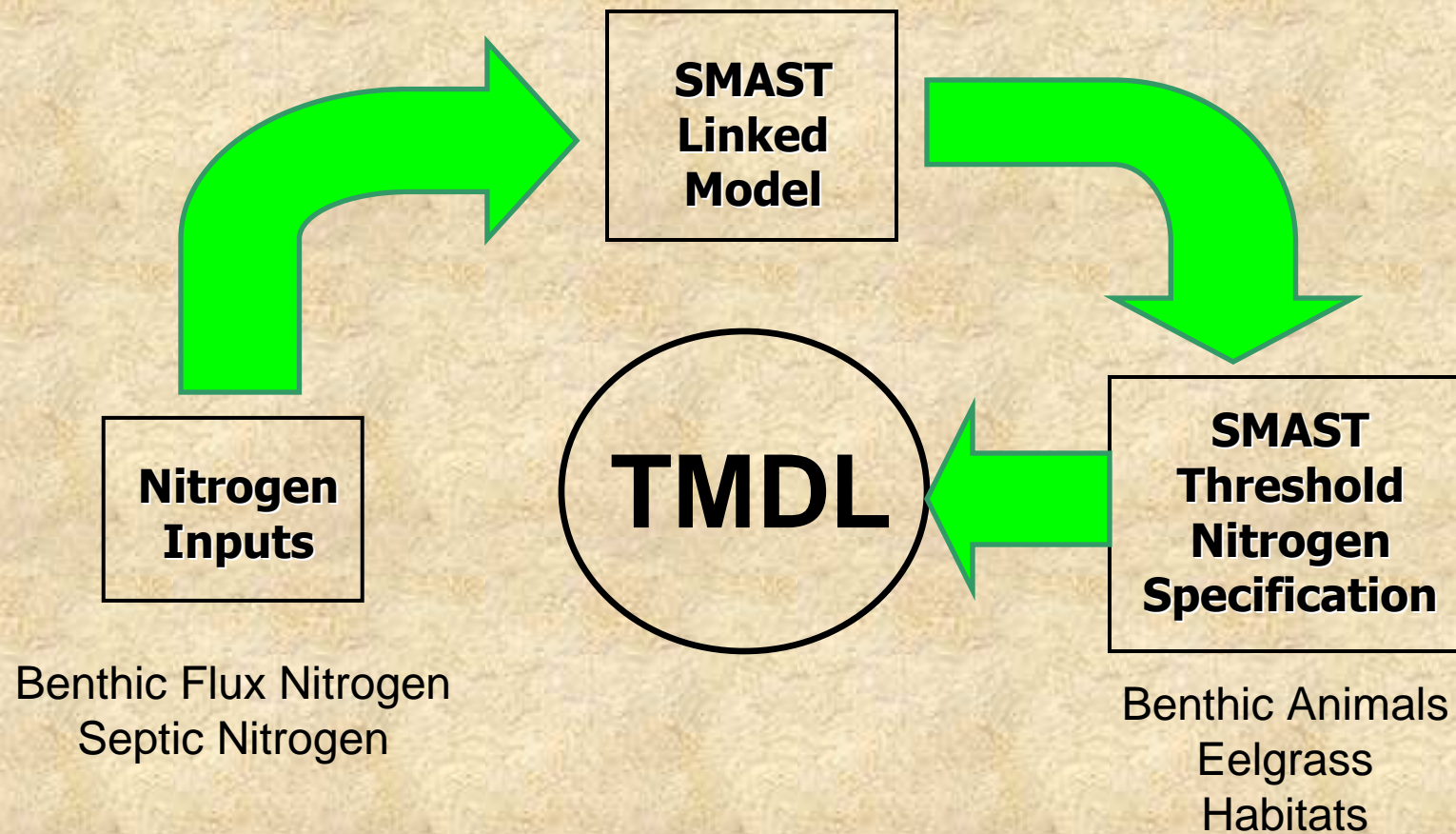
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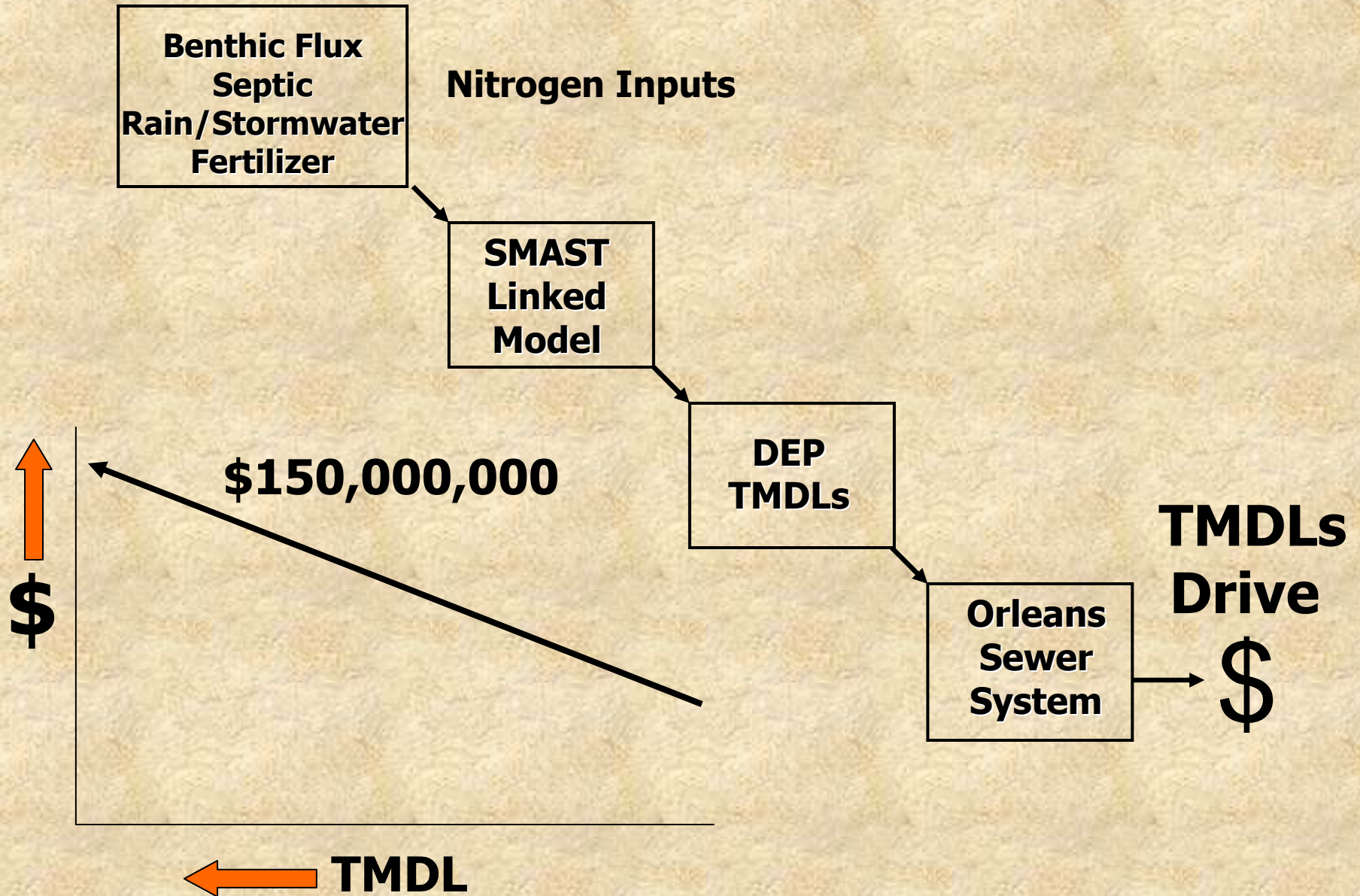
# TMDLs

## Right at the Center of It All

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# TMDL Values Drive Sewer System Cost



# Proceeding to Phase 1 Design

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- **Completing the Validation Work**
- **Phase 1 Actions**

# Completing the Validation

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- **Include peer review of Rock Harbor and Nauset–Town Cove Reports in the charge**
- **Provision for 3 Tasks in FY10**
  - **Investigation of Rock Harbor and Nauset – Town Cove Reports**
  - **Groundwater data as a check on SMAST assumptions**
  - **Model runs confirming Phase 1 scope and results of peer review work**

# Action Plan

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- **Complete peer review of Pleasant Bay Report [May 2009]**
- **Work with Wright-Pierce on the conceptual design of cluster systems**
- **Manage preliminary design work**
- **Prepare for Phase 1 design work**

# **Key Aspects of Phase 1**

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- **Schedule**
- **Project Decision Making**
- **Scope and Cost Estimates**
- **Assist Town Administrator in Preparation for Design Work**

# Summary

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## Issues for the Board of Selectmen

- **Extension of charge to Rock Harbor and Nauset Reports**
- **Inclusion of FY10 tasks to complete validation work**
- **Clarification of responsibility for all design work**

**Thank You**

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