

# Environmental Restoration of Historic Ellisville Marsh

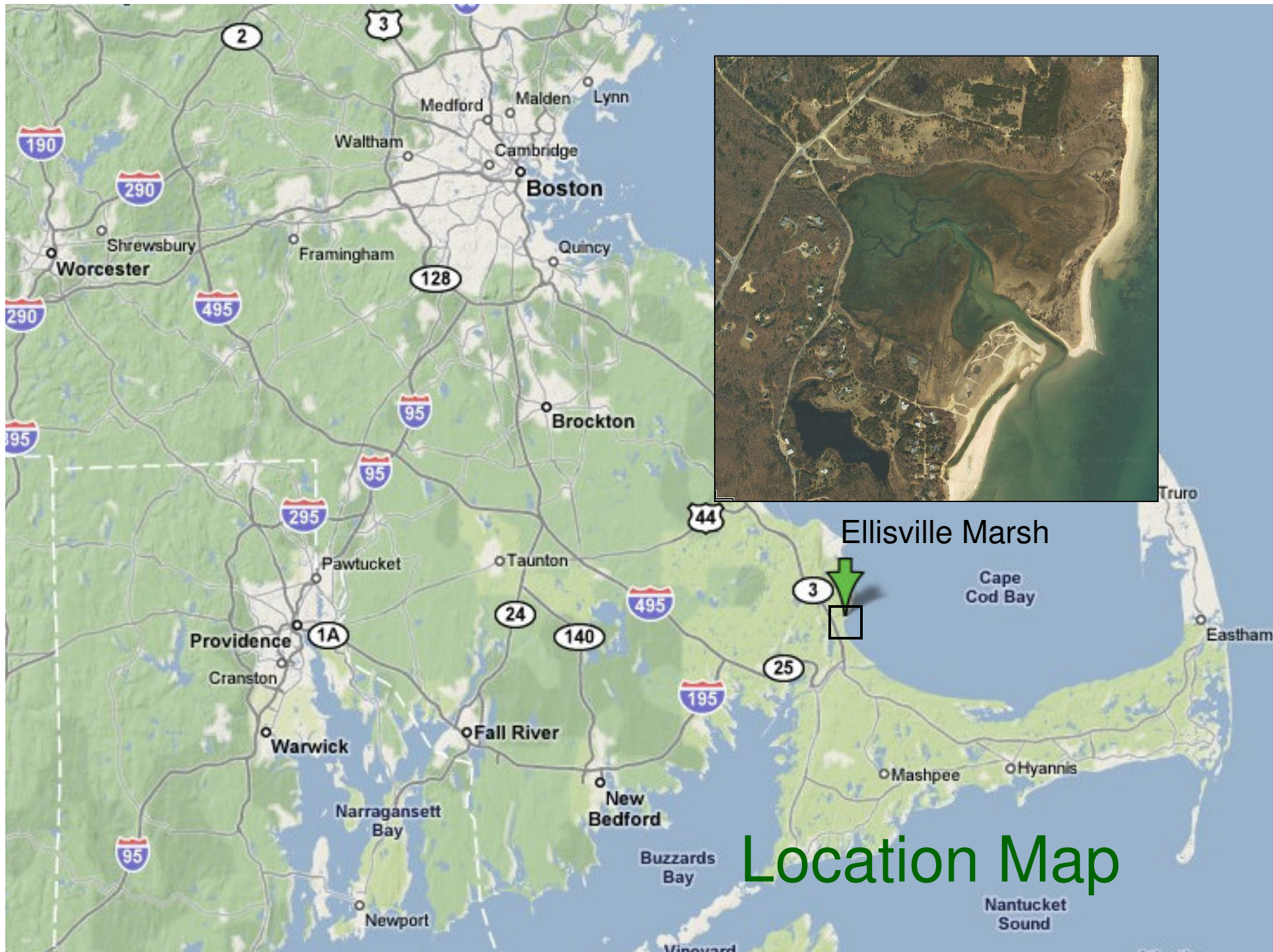
Prepared by Friends of Ellisville Marsh, Inc.



Aerial photo credit: Dave Keddell,  
U.S. Army Corps of Engineers

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Ellisville Marsh

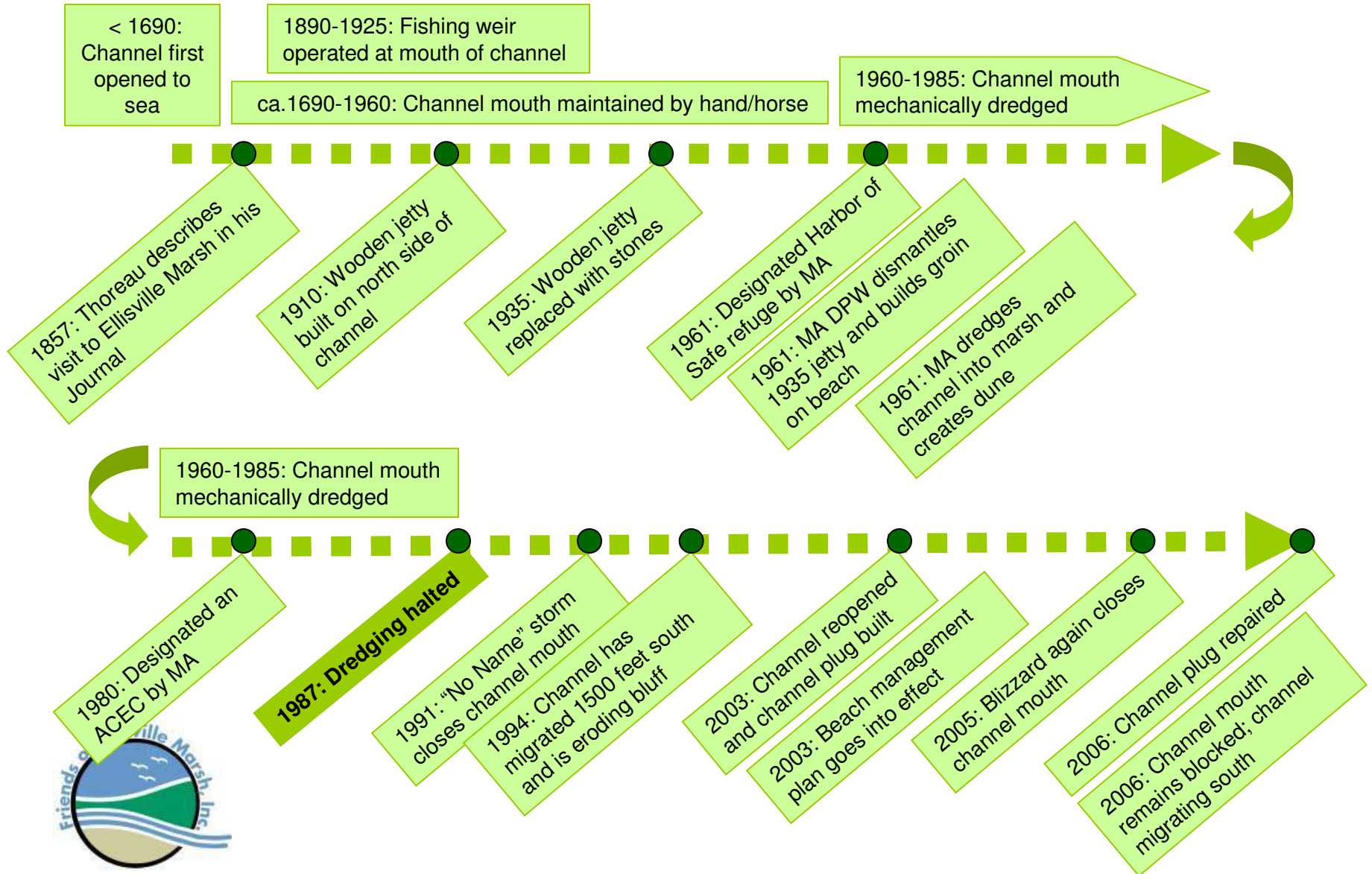
Location Map

# Short History

- The 55-acre Ellisville Marsh lies within Shifting Lots Preserve and the adjacent Ellisville Harbor State Park; it is both a fresh water estuary and salt marsh
- The channel from Cape Cod Bay into the marsh was blocked by the “No-Name” storm in 1991 and tidal flows became severely restricted
- The marsh ecosystem suffered deteriorating hydrology, water quality, and salinity leading to plant die-off
- The migrating channel caused irreparable damage to the bluff at the northern end of Lookout Point
- The channel was reopened in November 2003 at private expense under one-time permits issued by the Army Corps of Engineers and MA Department of Environmental Protection
- Significant environmental benefits were subsequently observed; no negative impacts have been observed to date
- Tidal flow restriction began again with the Blizzard of 2005



# Historical Timeline - Ellisville Marsh



# Conditions Prior to Channel Reopening in November 2003





# Good Intentions

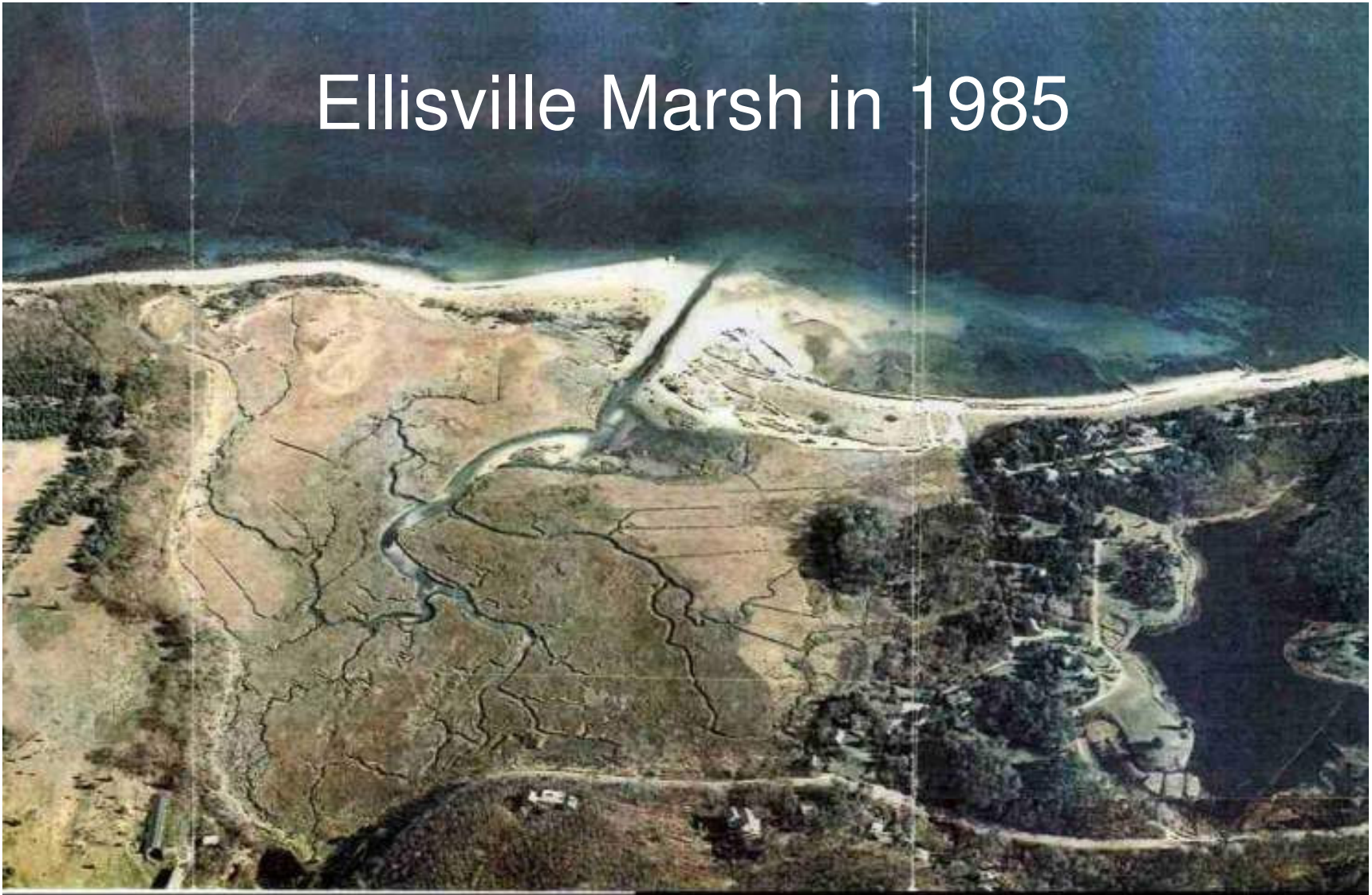
*“The ACEC designation will help support local efforts to protect this area. There is also a strong consensus among the area residents that Ellisville Harbor ought to be protected.”*

John A. Bewick  
Secretary of Environmental Affairs  
Commonwealth of Massachusetts

(From 1980 letter designating Ellisville Harbor as an Area of Critical Environmental Concern)



# Ellisville Marsh in 1985



Channel maintenance was performed periodically after major storms to keep the channel open; the marsh was fully vegetated. Two years later, dredging of the inlet channel was halted.



# Ellisville Marsh in 2000



The channel blockage that occurred in 1991 ultimately altered and elongated the channel path, restricting tidal flows into and out of the marsh.



# Aerial View Prior to 2003 Channel Reopening and Beach Management Plan



# Expert Opinions Prior to the 2003 Channel Reopening

- William Hubbard, Chief, Environmental Resources Branch, Army Corps of Engineers (August 29, 2001):

*“It seems from the site visit that your wetlands are drowning and are experiencing a drastic salinity change due to tidal restrictions.”*

- Ed Reiner, Senior Wetland Scientist, U.S. EPA (June 11, 2003), following his inspection of the salt marsh on October 2, 2002:

*“I believe that the die-off of salt marsh vegetation is attributable to changes in the tidal hydrology since the former channel closed off and the new channel formed.”*



# Die-off of Marsh Vegetation

- Direct observation of the marsh prior to 2003 channel reopening revealed—
  - Dead short stems of *Spartina alterniflora*/other salt marsh grasses
  - Large areas of mud containing no vegetation
  - Growth of algal flats
  - Greatest die-off effect in upper reaches of marsh





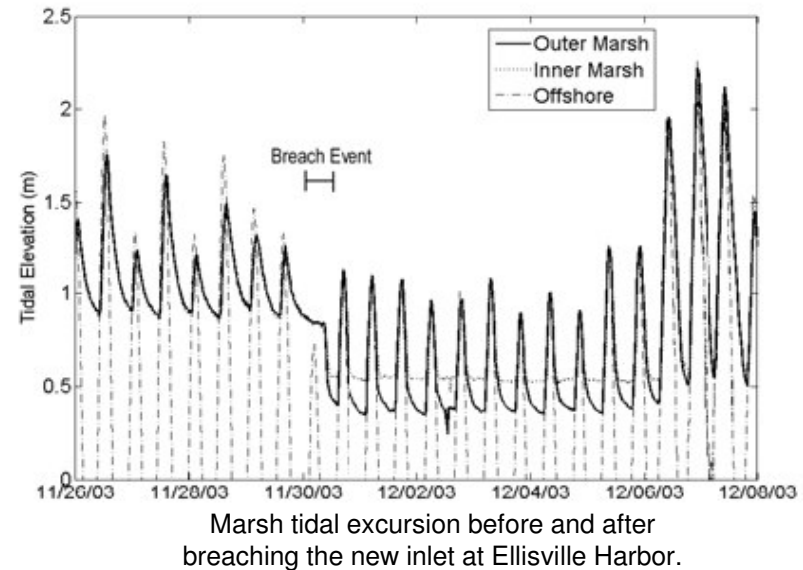
# Conditions Following Channel Reopening in November 2003



# Marsh Hydrology

- **Hydrology**— tidal flushing of the Ellisville marsh was significantly improved by the reopening of the channel mouth in 2003, as measured by water height in various locations. The marsh filled more completely during high tides and drained better during low tides after channel reopening.
- **Effect of Channel Reopening on Marsh System Health**— Following the inlet reopening, “marsh recovery has been documented within the historic [Ellisville] marsh area due to the larger tidal range (primarily a reduction in low tide elevations and a reduction in the hydroperiod across the marsh plain).” \*

\* Source: Ramsey, Kelley and Howes, “Quantifying the Influence of Inlet Migration on Tidal System Health” (2006).



# Wetland Response to Channel Restoration

*“The restoration of the historic channel had profound positive influences on the salt marsh system of Ellisville Harbor. Prior to opening the restriction of the tidal flows had resulted in the death of much of the salt marsh grasses in the upper third of this wetland. With the restoration of tidal flows, the wetland grasses showed an immediate regrowth and rapid recolonization.”*

—Dr. Brian Howes and Roland Samimy, UMass Dartmouth School for Marine Science and Technology, Summary of Water Quality Monitoring Program (Draft Final report), South Coastal Basin Estuaries Monitoring 604(b) Grant, DEP #2003-04/604, July 20, 2005, p. 19.





# Water Quality

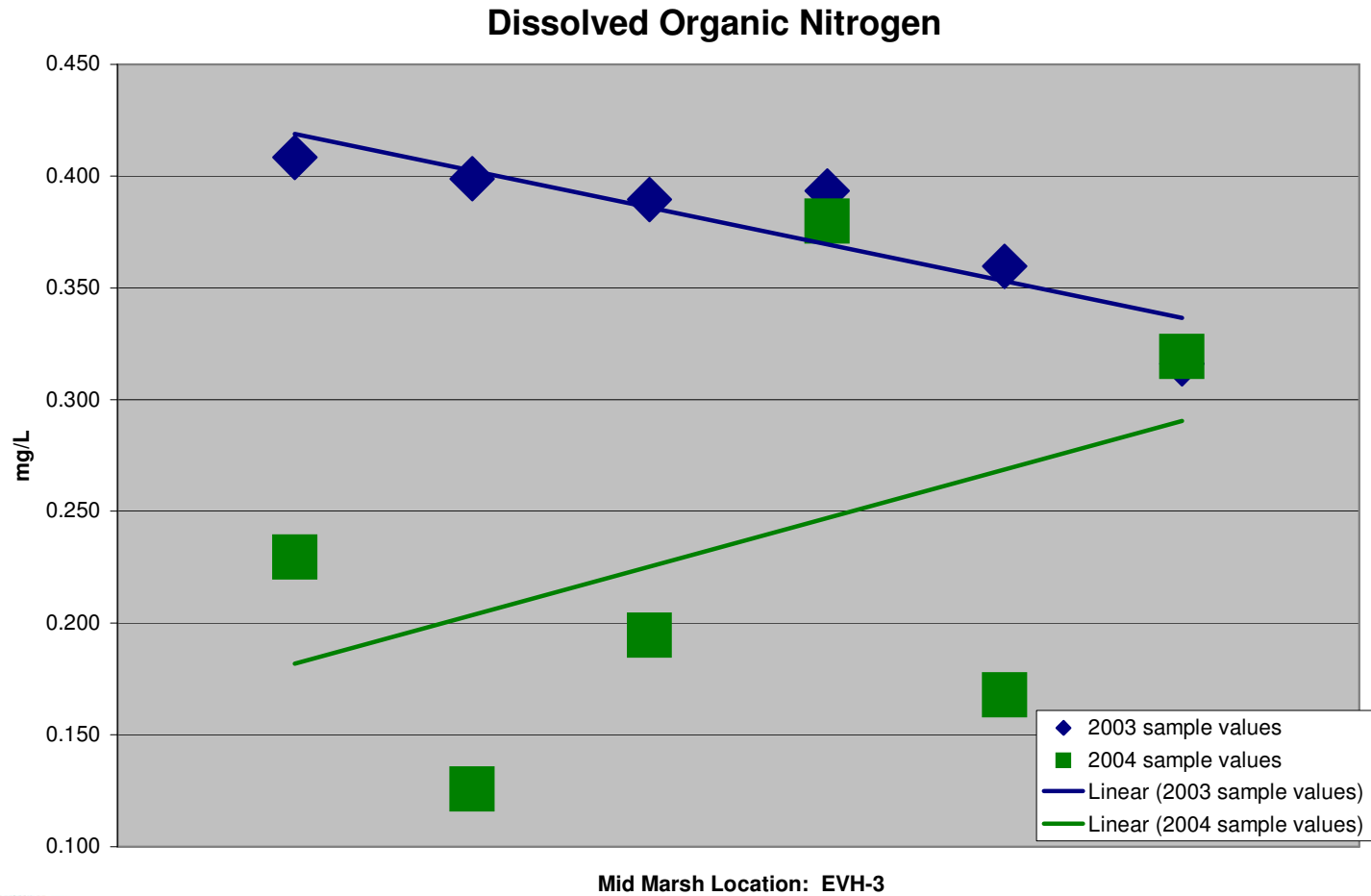
## **Water Quality “indications” in SMAST\* project sampling data (pre- and post-dredging)—**

- Dissolved organic nitrogen (DON) decreased from 2003 to 2004
- Chlorophyll concentration declined, especially in the upper reaches of the marsh
- Coliform counts declined in the upper reaches of the marsh.
- Some indications by 2005 that reversal of the effects of channel mouth reopening may have begun due to increasing tidal flow restriction (as measured by DON and coliform concentrations).



\*School for Marine Science and  
Technology, UMASS Dartmouth

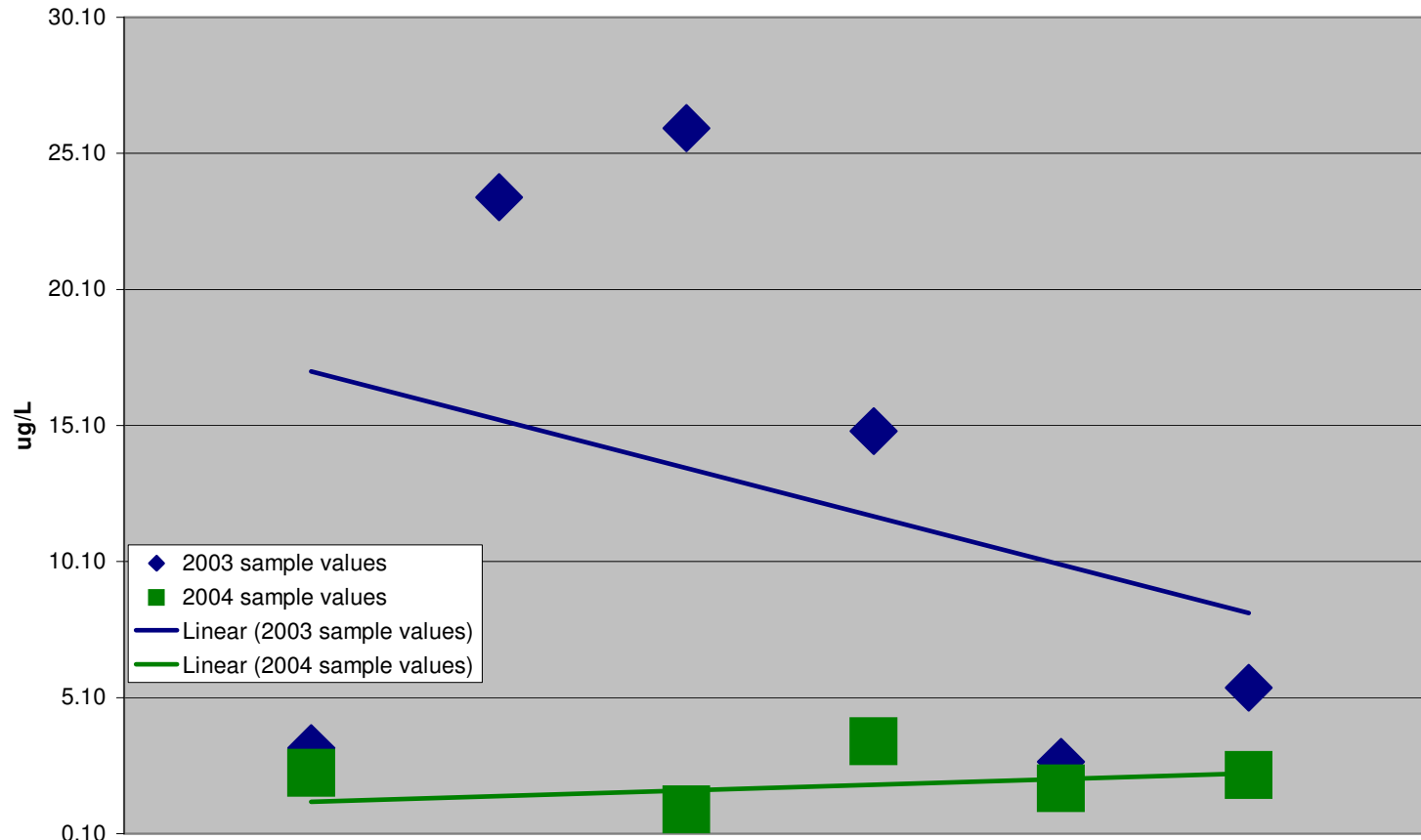
# Typical "Indications" from SMAST Raw Data\*



\*Indicative only; no firm conclusions may be drawn due to the study design and limited data availability.

# Typical "Indications" from SMAST Raw Data\*

## Chlorophyll



Mid Marsh Location: EVH-4

\*Indicative only; no firm conclusions may be drawn due to the study design and limited data availability.





# Participation in Estuaries Monitoring Project

- Members of the Friends are actively involved as volunteers in the SMAST South Coastal Basin Estuaries Monitoring project
- SMAST's project was only intended to show background nutrient water quality in estuaries, including Ellisville marsh
- Hence, applicability of the SMAST data is extremely limited for determining overall health of a salt marsh
- 2003 vs. 2004 (pre- vs. post-dredging) data comparisons are therefore "indicative," not "conclusive"
- A study designed around the specific needs of the salt marsh should be pursued; public grant programs exist



# Collaboration with MA Office of Coastal Zone Management

- The Friends have received technical assistance and equipment from the Massachusetts Office of Coastal Zone Management to establish a low-cost technique for monitoring changes along the Ellisville barrier beach.
- Friends volunteers will use the Emery Rod technique to measure barrier beach elevation changes after major storms.

Aerial view of Ellisville Beach and Ellisville Marsh tidal inlet channel showing locations of transects that have been set up to enable low cost monitoring of barrier beach elevations on an ongoing basis.

Friends director Ellen Russell has received generous assistance from Jason Burtner and Tim Smith of the Massachusetts Office of Coastal Zone Management in setting up this program.



# Collaboration with Mass Audubon for Shore Bird Protection

## **Federally Protected Shore Birds**

The Director of Mass Audubon's Coastal Waterbirds Program stated in 2007 *"...that the beach changes since the 2003 dredging have positively affected plover habitat. The physical changes to the beach, particularly increased sand deposition to the south, have enhanced and extended the potential nesting area. The beach has added 6-8 feet of height in some areas and the channel no longer bisects the potential nesting habitat."*



Photo courtesy of John Van de Graaff

Volunteers representing the Friends assisted Mass Audubon with monitoring and protection of piping plovers on Ellisville Beach during summer 2007.



# Fish Restoration

- Prior to the channel reopening in late 2003, large fish had not been reported in the marsh for several years.
- Local fishermen reported in summer of 2004 that striped bass as large as 40” in length were taken in the back marsh, as well as numerous fish in the 28-36” range.
- There is documented history of eels being present in the marsh; grant programs exist to fund restoration of American eel and anadromous fish species.





# Current Conditions (Aug 2007)



Channel blockage is again restricting tidal flows, with the result that flushing and draining of the marsh are inadequate to maintain healthy vegetation.

Die-off of marsh grasses has recurred in the back marsh.



# Our Goals

## Short Term:

Obtain regulatory permits that enable the reopening and ongoing maintenance of the Ellisville Marsh inlet channel.

## Long Term:

Conduct environmental monitoring and support scientific studies that create the basis for understanding factors and conditions that contribute to, or detract from, the health of Ellisville Marsh.



# For Further Information

Visit us at: [www.EllisvilleMarsh.org](http://www.EllisvilleMarsh.org)

To request information:  
[Info@EllisvilleMarsh.org](mailto:Info@EllisvilleMarsh.org)

**Please consider becoming a member of the  
Friends of Ellisville Marsh today!**

**All donations are fully tax deductible.**

