

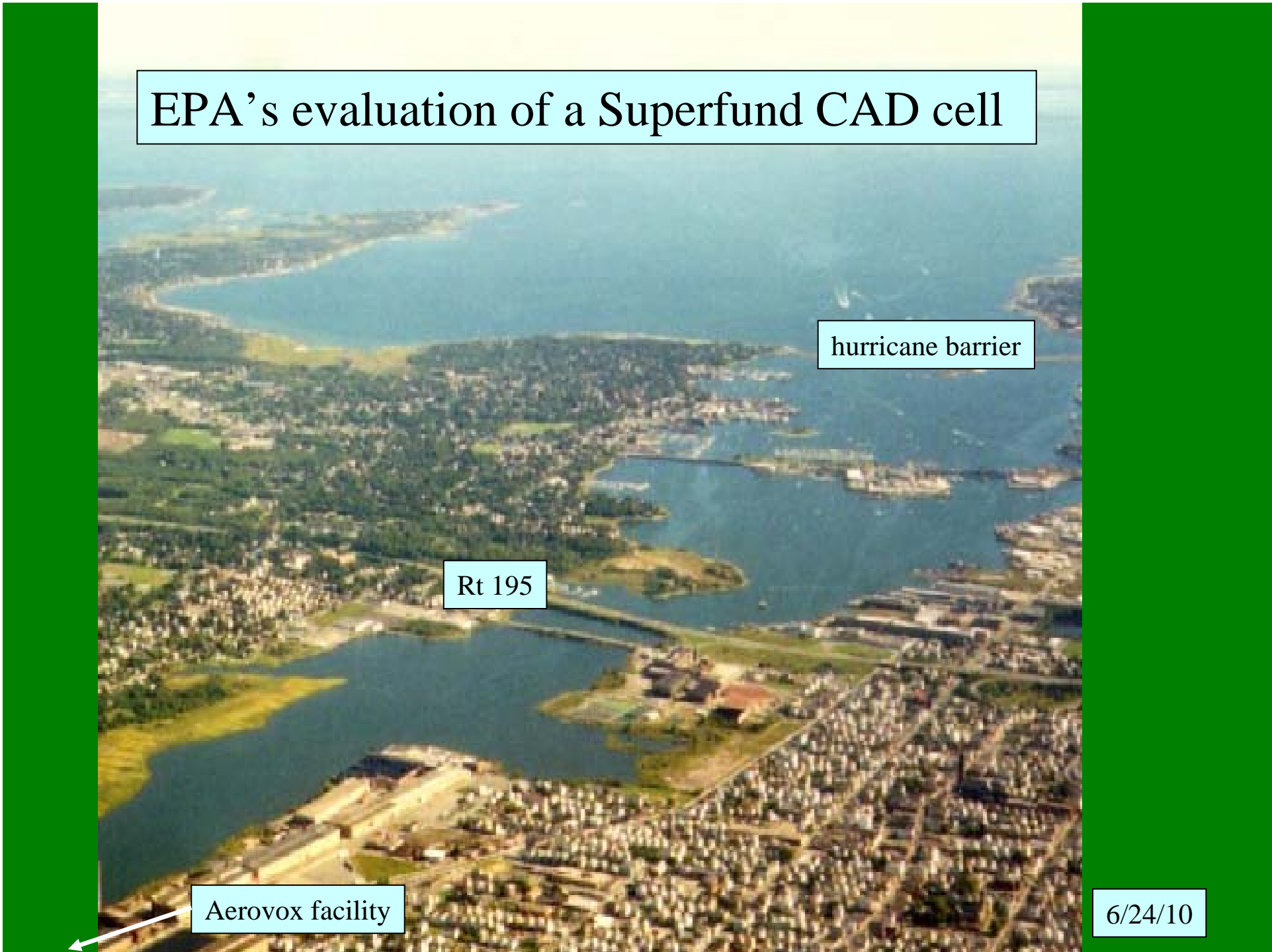
EPA's evaluation of a Superfund CAD cell

hurricane barrier

Rt 195

Aerovox facility

6/24/10



the upper harbor, looking north

Aerovox



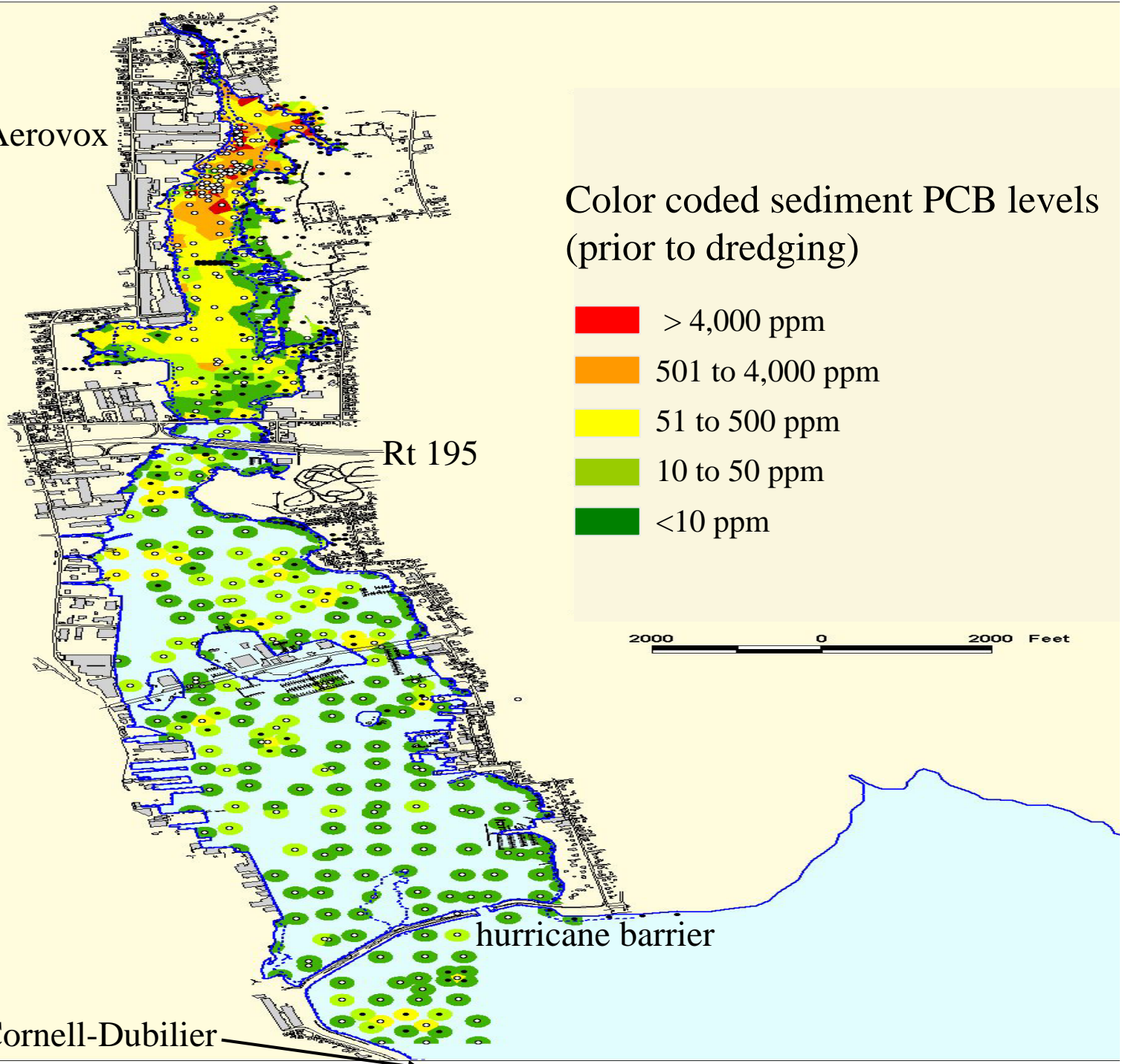
11/10/2003

The lower harbor and hurricane barrier

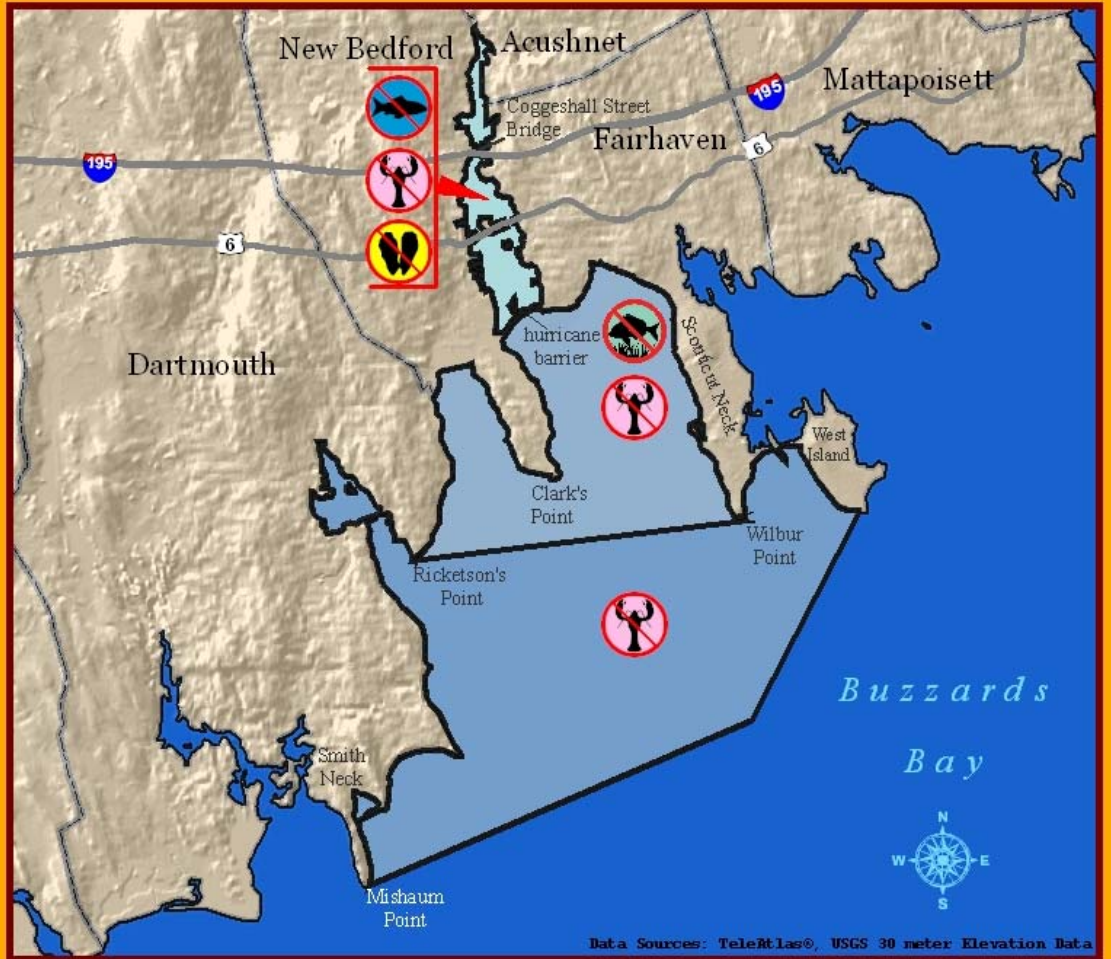




Aerovox



The 1979 state fishing ban - due to PCBs (covers 18,000 acres)



Do NOT eat any fish
 No coma pescado
 Não coma peixe



Do NOT eat any lobster
 No coma langosta
 Não coma lagosta



Do NOT eat bottom feeding fish
 No coma pescado de fundo:
 Não coma peixe de fundo:

- flounder
- linguado
- solha
- scup
- sargo
- sargo
- tautog
- tautoga
- bodião da ostra
- eel
- anguila
- anguila



Do NOT eat any shellfish
 No coma mariscos
 Não coma mariscos

1998 Superfund Cleanup Plan:

Sediments in red require
cleanup

app. 900,000 cubic yards

app. 270 acres

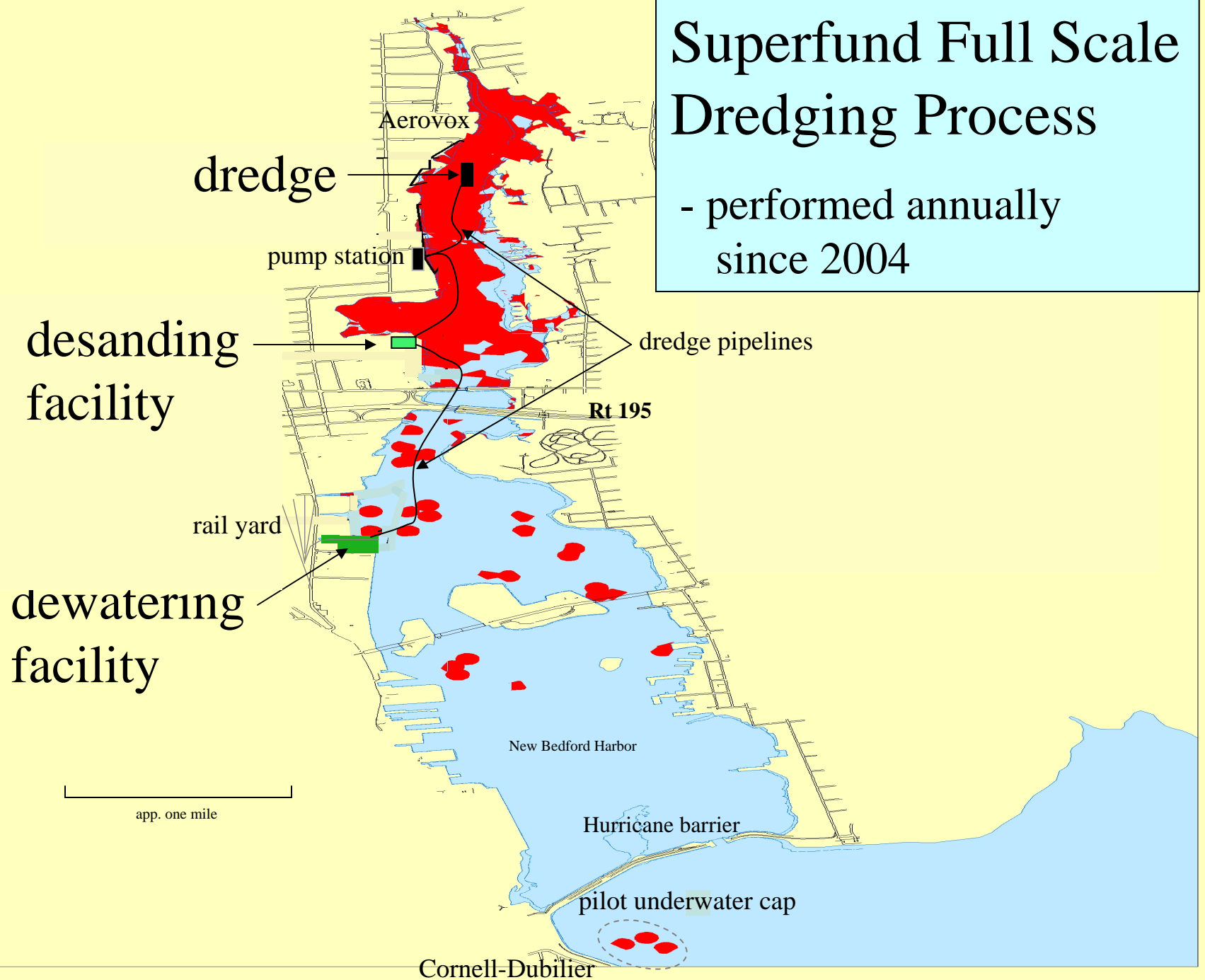


River banks also need cleanup and restoration in addition to sediments

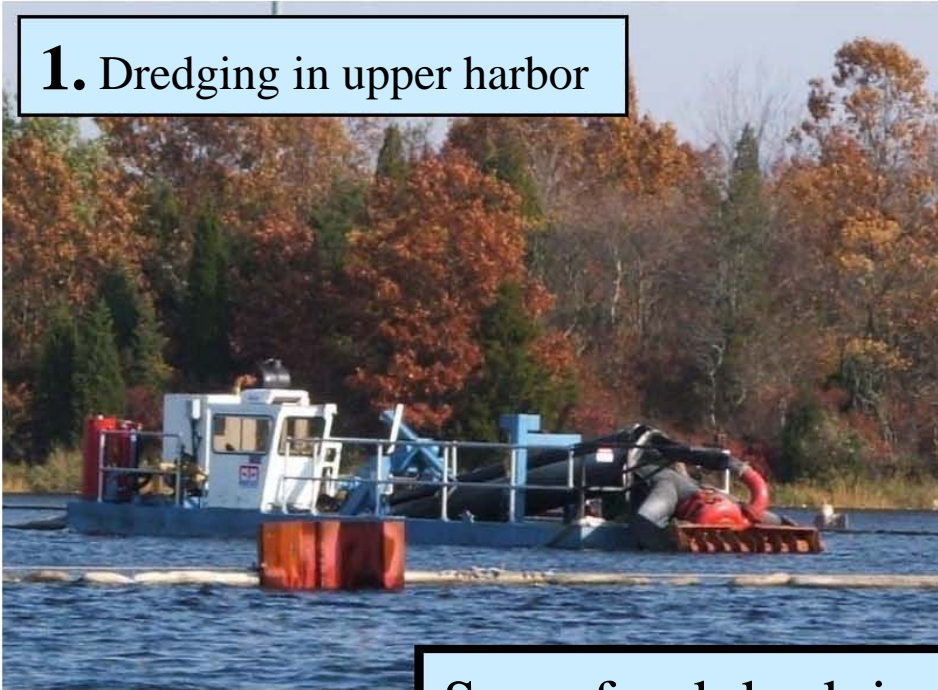


Superfund Full Scale Dredging Process

- performed annually
since 2004



1. Dredging in upper harbor



2. Desanding



Superfund dredging and disposal operations

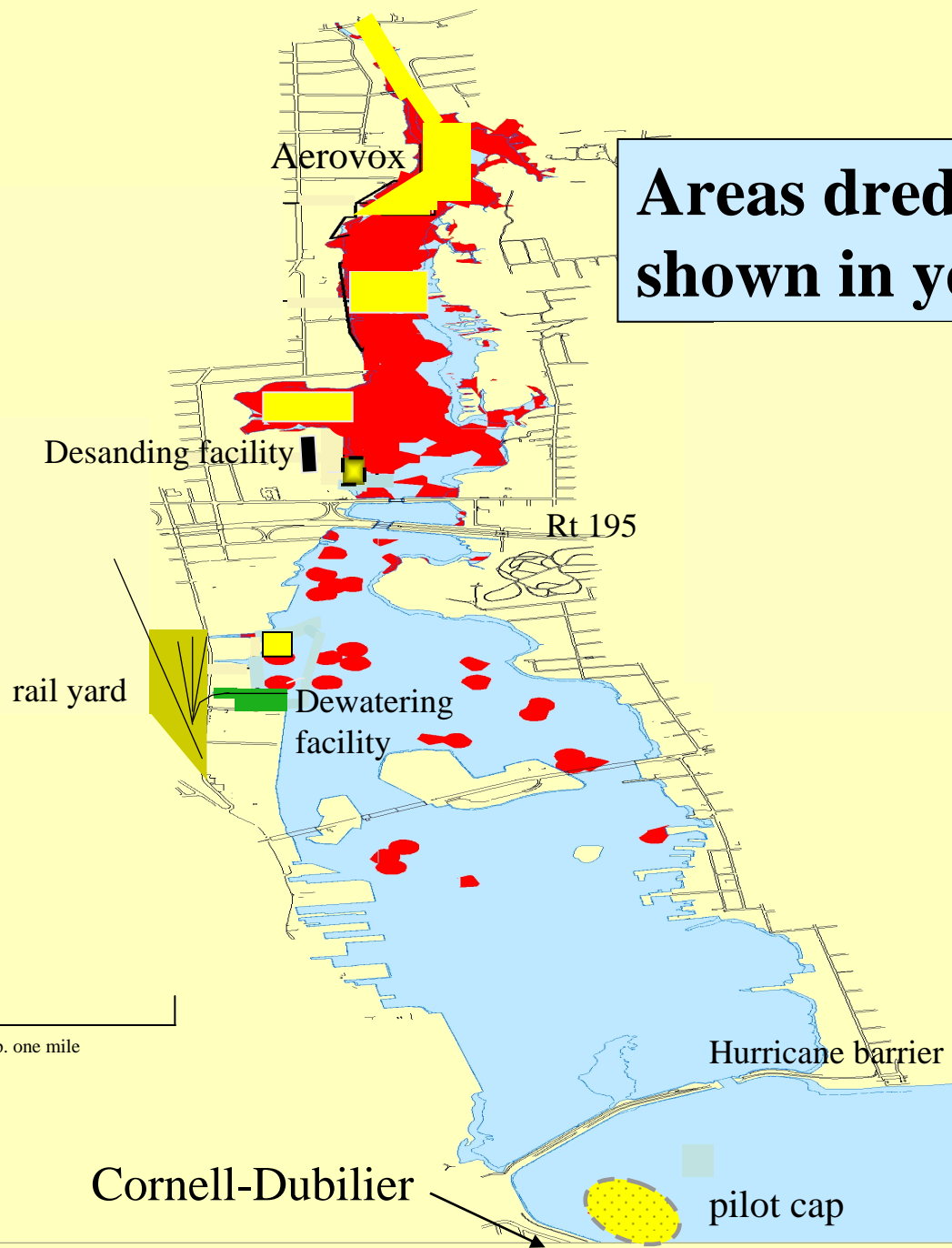
3. Dewatering



4. Loading to rail for offsite disposal



**Areas dredged to date
shown in yellow**



app. one mile

Cornell-Dubilier

Hurricane barrier

pilot cap

Aerovox

Desanding facility

Rt 195

rail yard

Dewatering facility

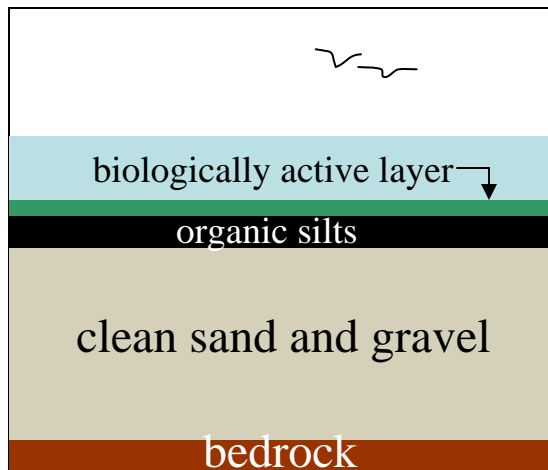
Estimates of Time and Cost to Complete Current Remedy

<u>Annual funding level</u>	<u>Years to complete</u>	<u>Cost to complete</u>
→ \$15 million	46	\$1.7 Billion
\$30 million	40	\$1.2 Billion
\$80 million	7	\$536 million

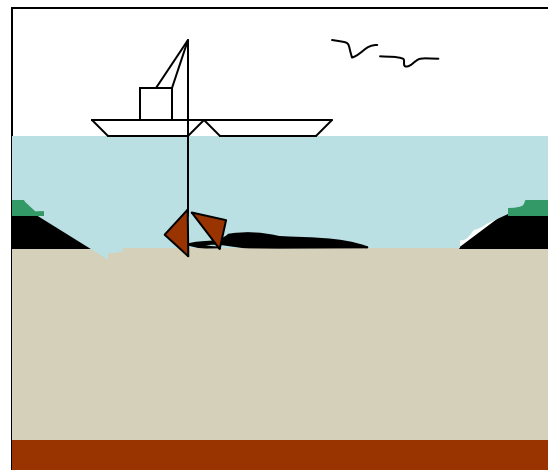
NOTE: 3.5% annual inflation assumed

One alternative to speed the harbor cleanup:
a lower harbor CAD cell for Superfund material

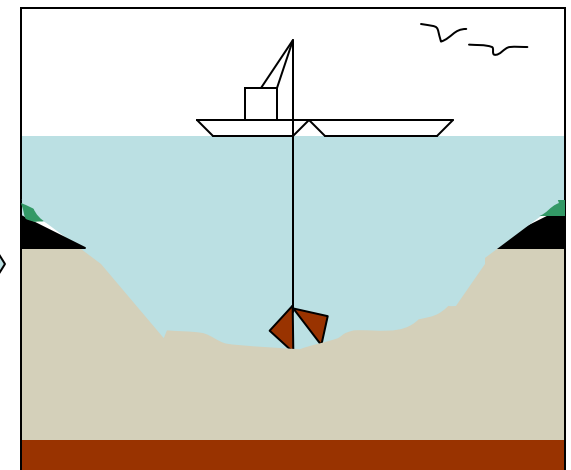




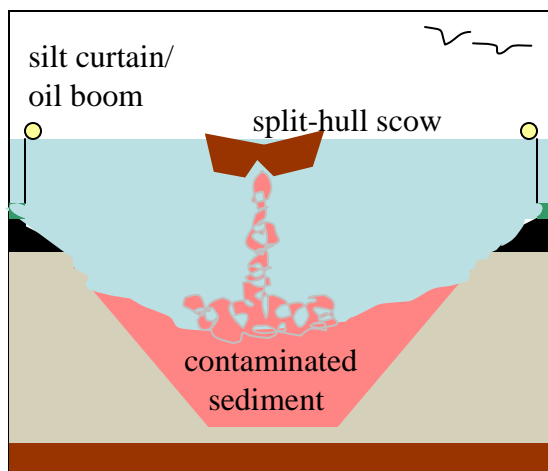
1. Harbor bottom as is



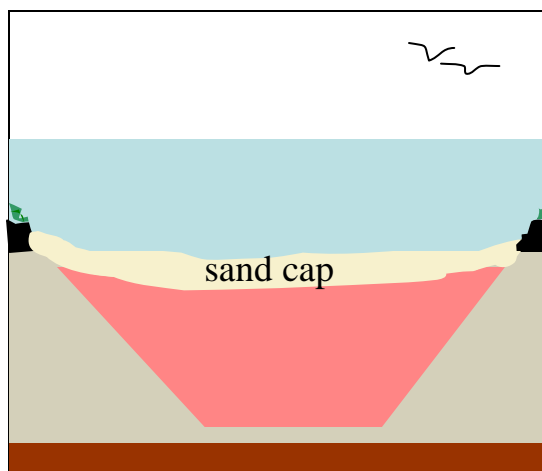
2. Excavation of top silts



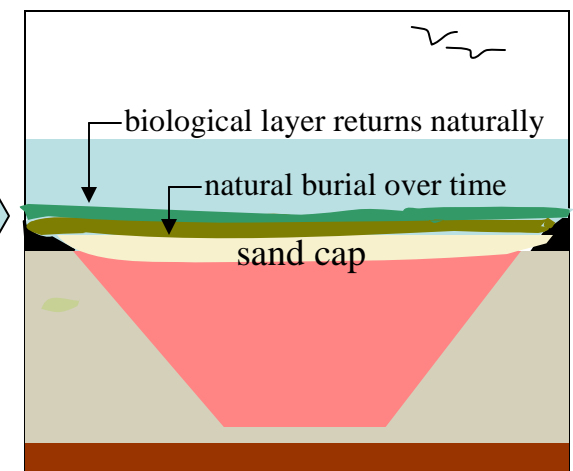
3. Excavation of clean sand



4. Placement of sediments



5. Placement of initial cap

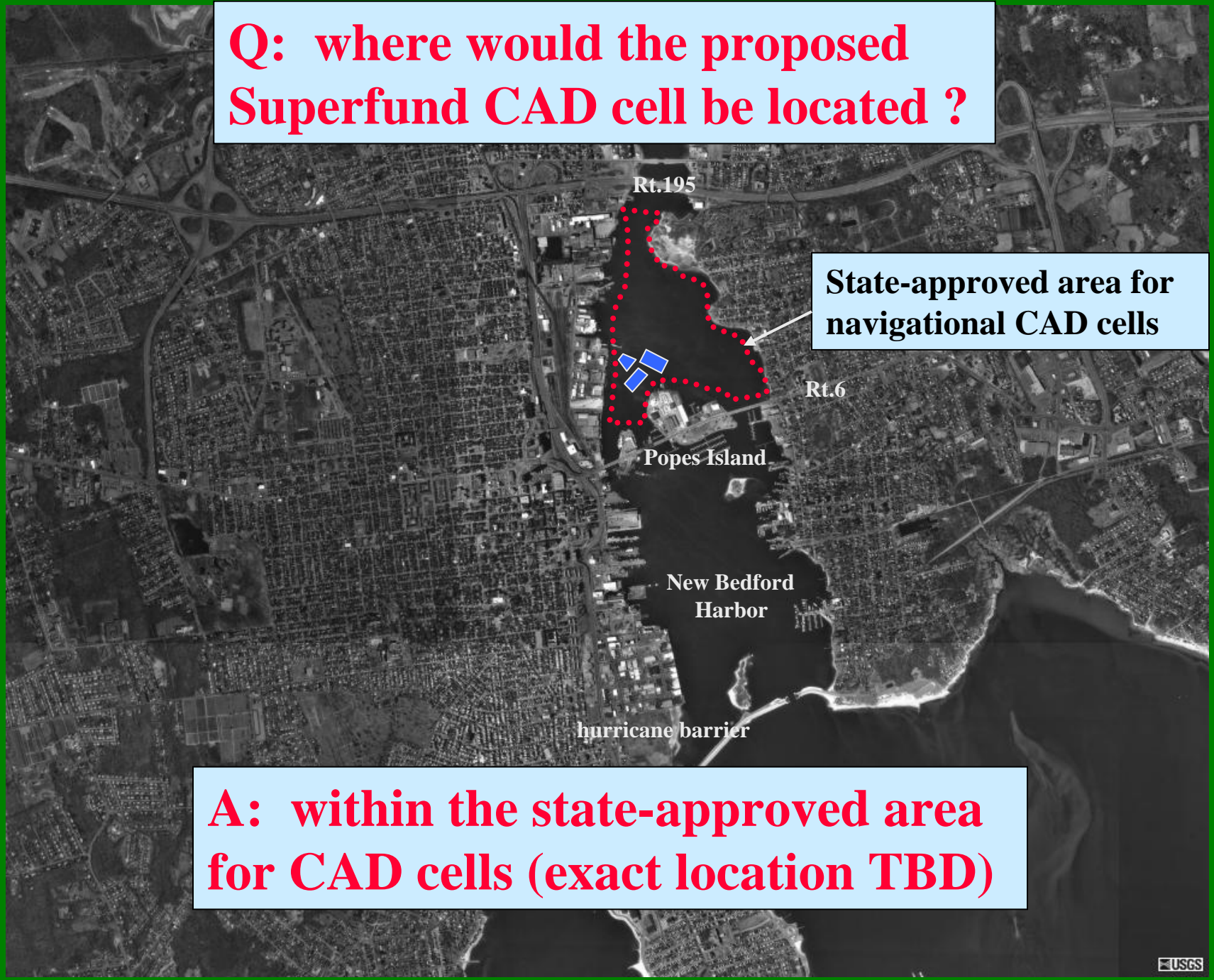


6. Surface fills in over time

What is a confined aquatic disposal cell?

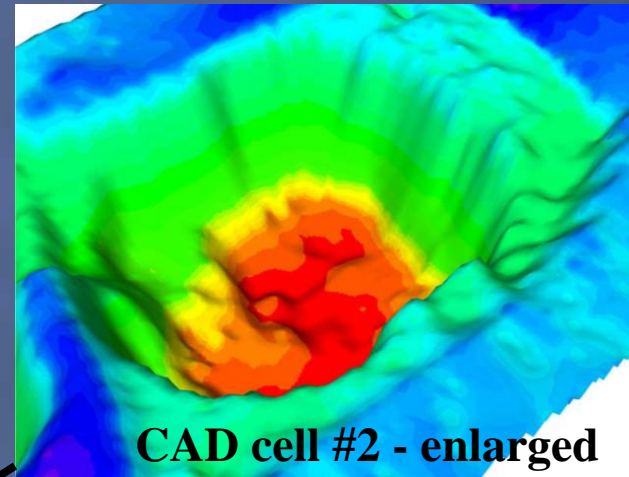
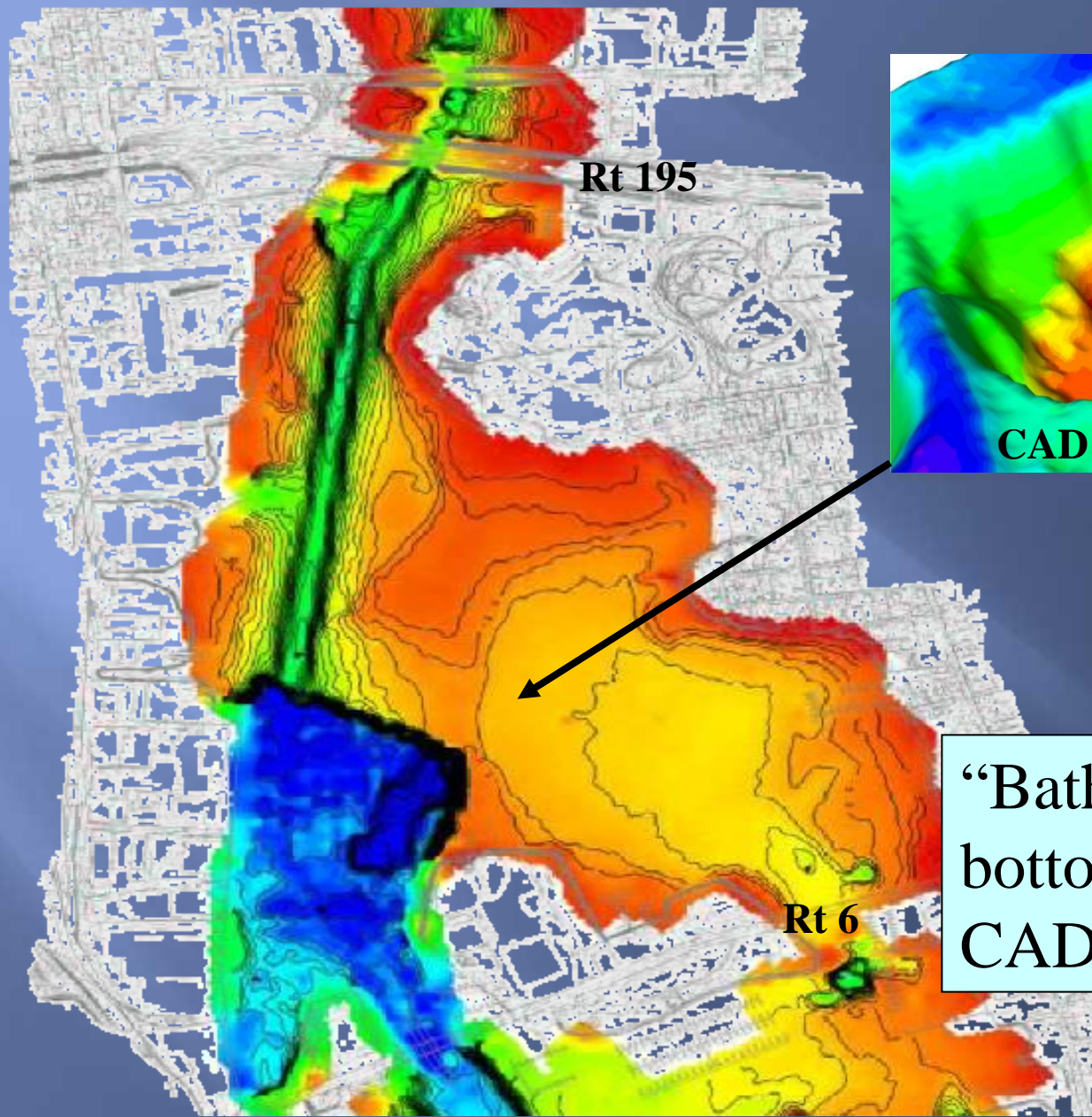
For illustrative purposes only – NOT TO SCALE

Q: where would the proposed Superfund CAD cell be located ?



State-approved area for navigational CAD cells

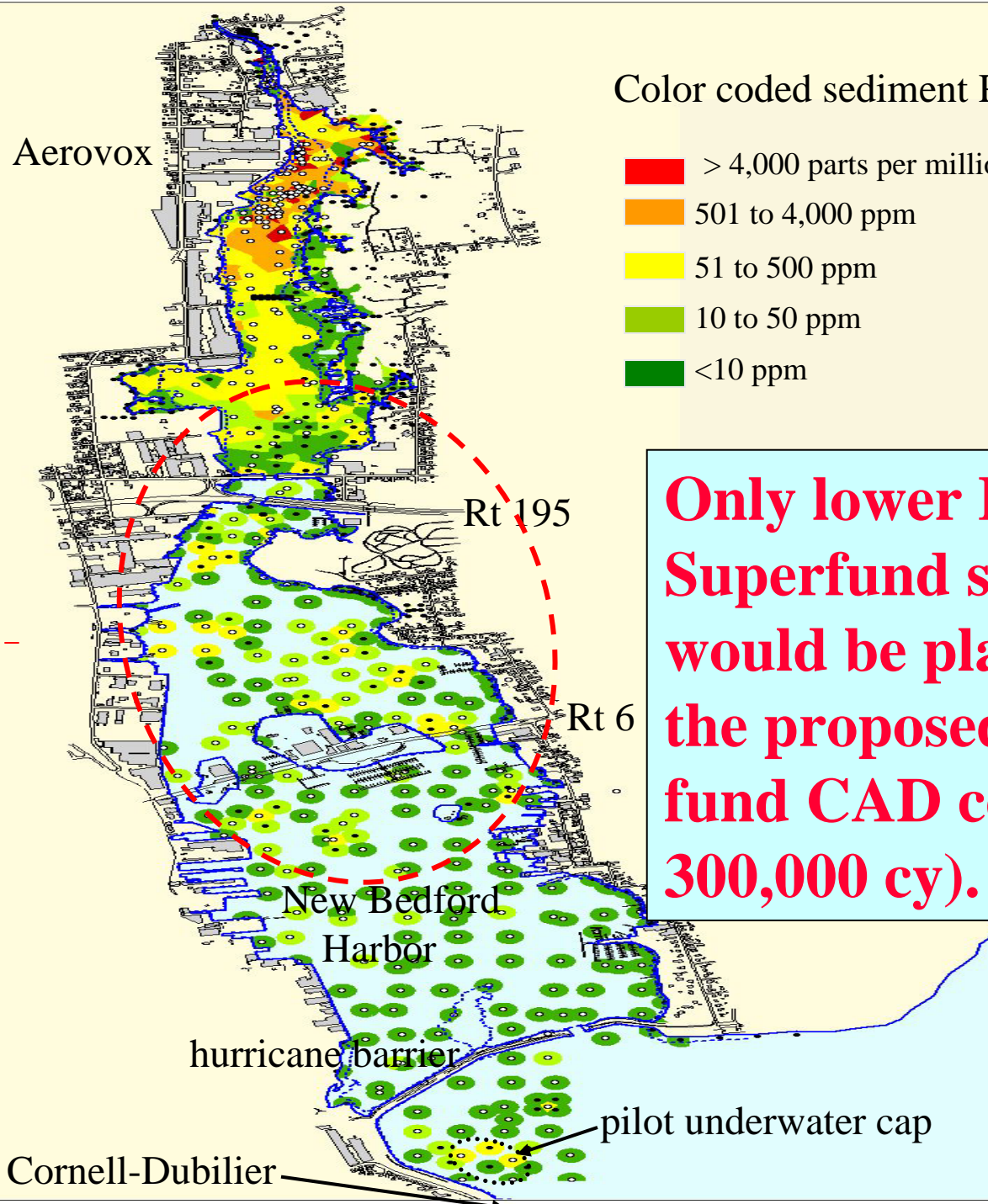
A: within the state-approved area for CAD cells (exact location TBD)








“Bathymetry” of harbor bottom and navigational CAD cell #2



Aerovox



Color coded sediment PCB levels:

-  > 4,000 parts per million (ppm)
-  501 to 4,000 ppm
-  51 to 500 ppm
-  10 to 50 ppm
-  < 10 ppm

Only lower PCB level Superfund sediment would be placed in the proposed Superfund CAD cell (app. 300,000 cy).

Rt 195

Rt 6

New Bedford Harbor

hurricane barrier

pilot underwater cap

Cornell-Dubilier

Q: why do we believe that a CAD cell will safely contain the sediment placed into it?

A1: Water quality monitoring of navigational CAD Cell #2 in 2009 found no plume outside of the CAD cell

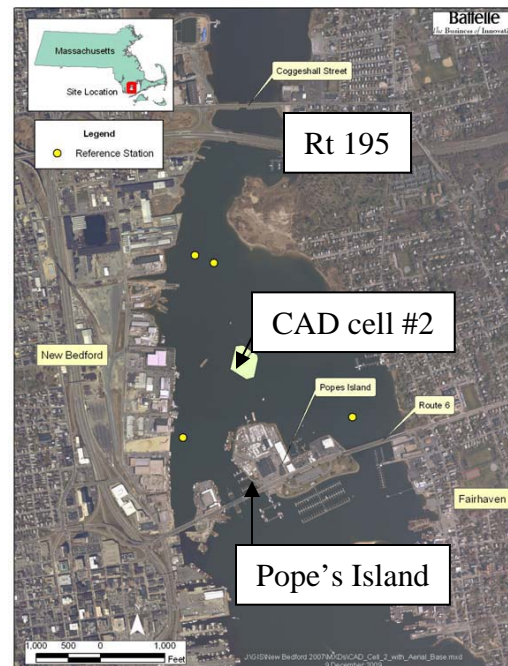
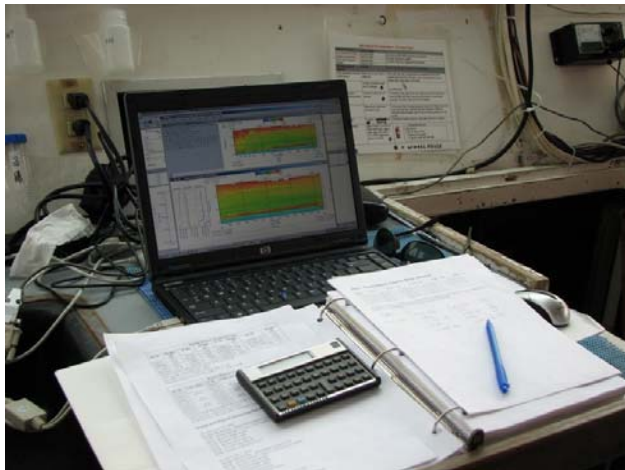
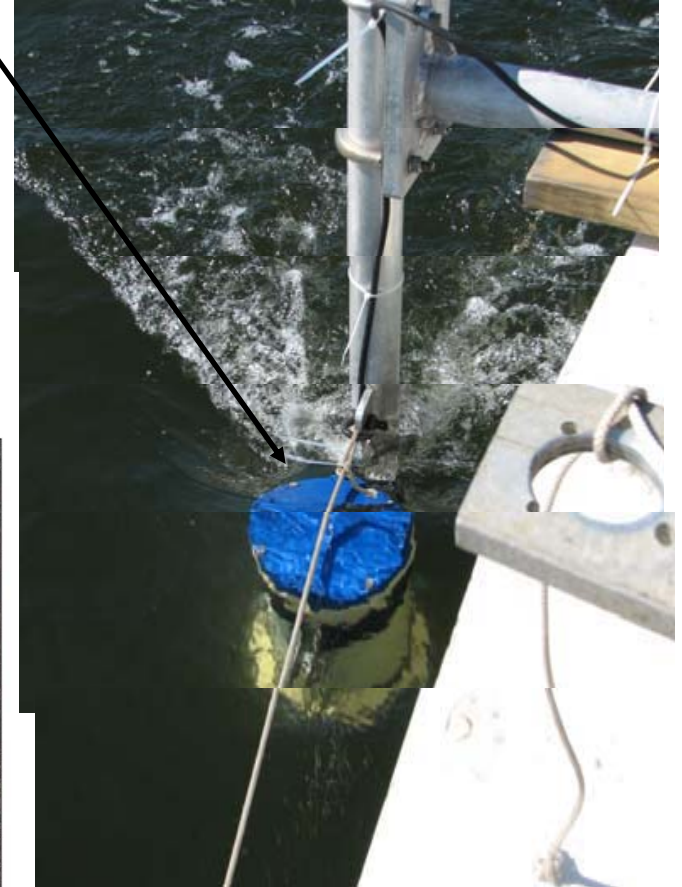
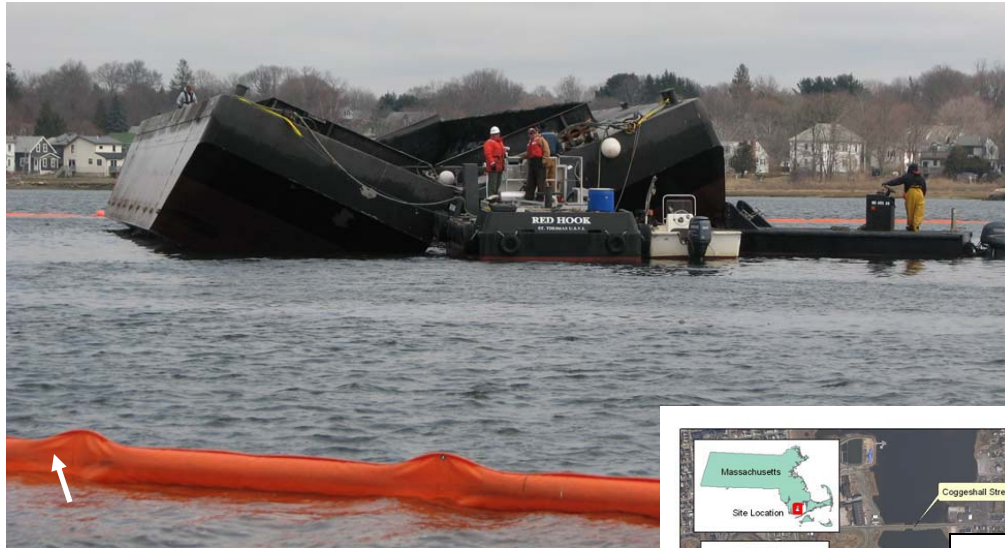
A2: the same monitoring found NO toxicity

A3: short and long term computer modeling

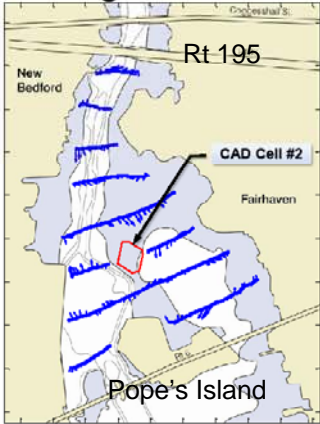
A4: performance standards would be used

Water Quality Monitoring of Navigational CAD Cell #2

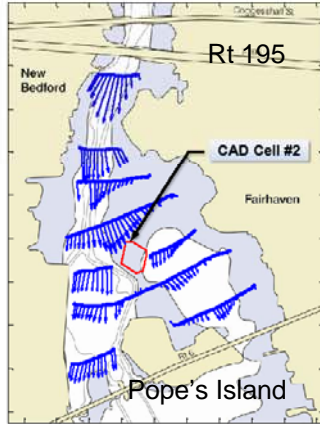
Acoustic Doppler Current Profiler



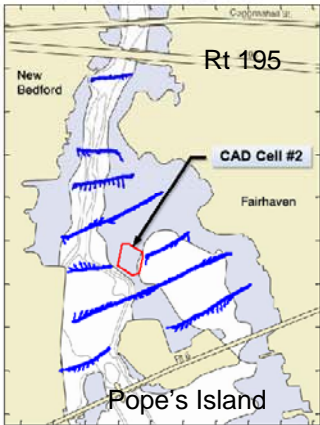
High Slack



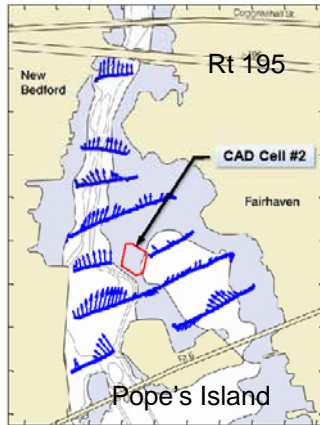
Max Ebb



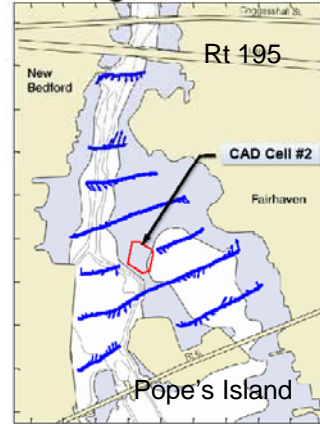
Low Slack



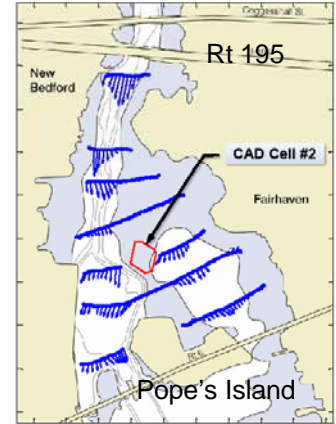
Max Flood



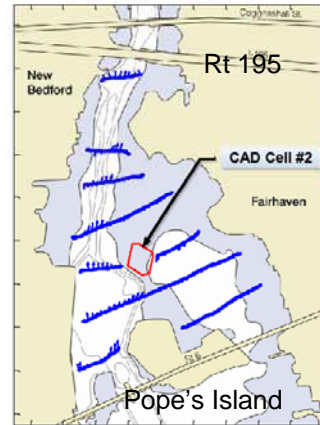
High Slack



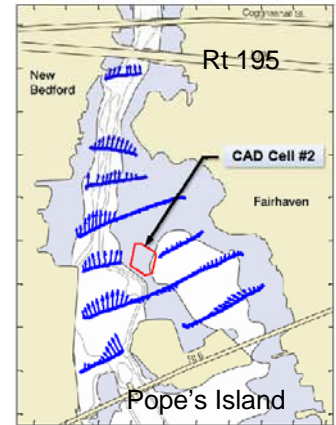
Max Ebb



Low Slack



Max Flood

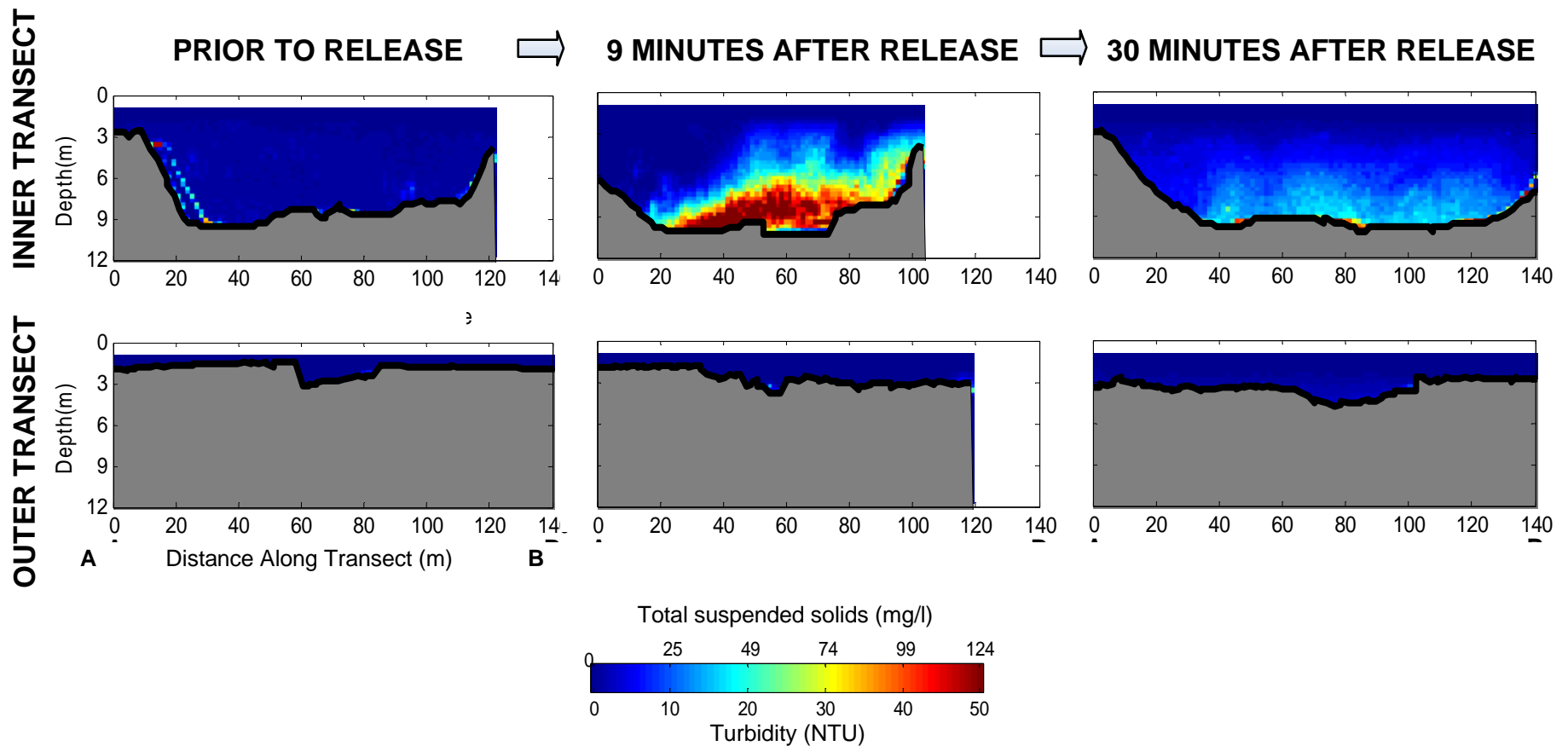
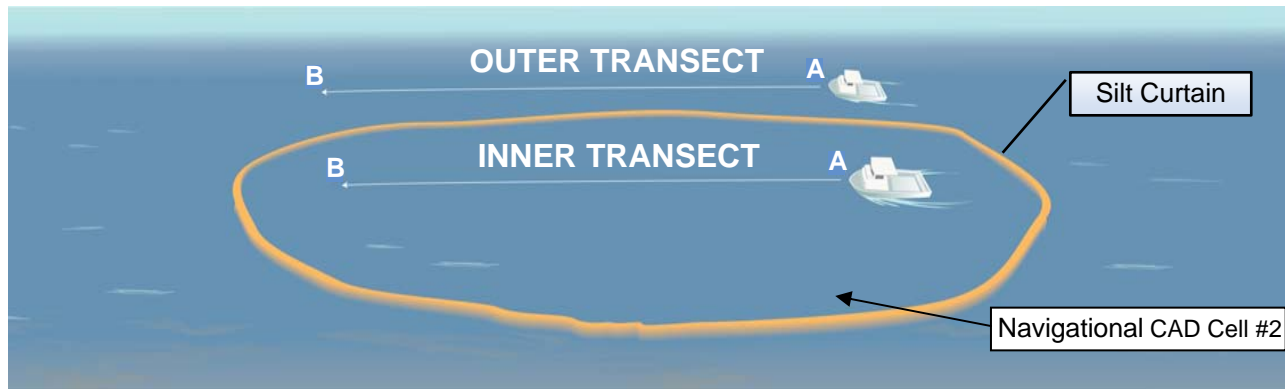


Surface Currents

Bottom Currents

Note: Arrows show current directions with arrow length proportional to speed.

Tidal Currents Were Measured to Predict Location of any Turbidity Plume



Turbidity Measured Inside and Outside of CAD Cell #2 - 2009

Laboratory Sampling Showed NO Aquatic Toxicity Inside or Outside of CAD Cell #2 - 2009

Sample	Time After Release (min)	Turbidity from ADCP (NTU)	Toxicity Results					
			Sea Urchin (<i>A. punctulata</i>)	Mysid Shrimp (<i>A. bahia</i>)			Red alga (<i>C. parvula</i>)	
			mean fertilization (%)	48-hr mean survival (%)	7-day mean survival (%)	7-day mean biomass (mg/mysid)	48-hr mean survival (%)	7-day mean reproduction (cystocarp/plant)
Lab Control	na	na	97.1	100	84.4	0.431	100	34.0
Site Reference	na	< 2	93.5 ¹	100	82.5	0.462	100	34.0
Outside silt curtain	49	~12	95.0 ¹	100	97.5	0.519	100	34.1
Inside silt curtain	20	~70	94.1 ¹	97.5	87.5	0.435	100	34.7
Acceptance Criteria (for Lab Control)			> 70	≥ 90	≥ 80	>0.2	no necrosis	≥ 10

The estimated total PCB loss from the sediments into the overlying CAD cell water is about 11.4 pounds over the first 3 years (prior to capping).

Controls such as silt fences and activated carbon can be used to limit migration of this 9 pounds beyond the CAD cell footprint.

This 11.4 pounds is about 0.08% of the 15,000 pounds of PCBs that would be disposed in the Superfund CAD cell.

Once in place, a 3 foot thick cap would prevent PCBs from migrating out of the CAD cell.

Shortening from a 3 year to a 2 year placement schedule would reduce estimated losses.

Results of computer modeling of CAD cell

Rt.195

CAD

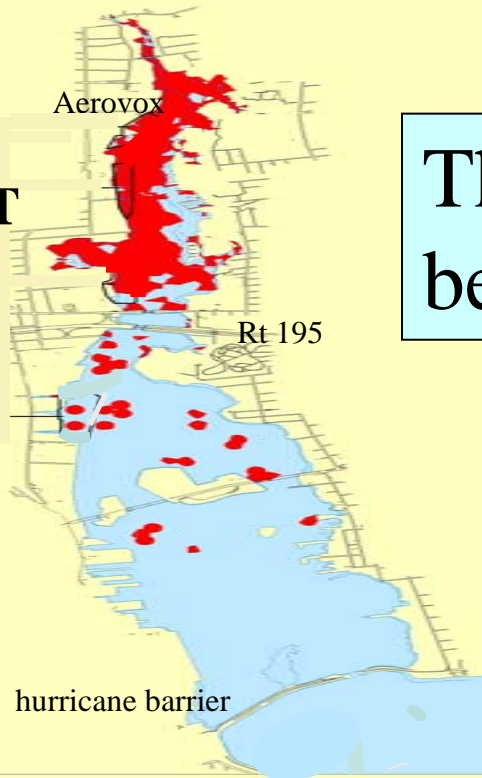
Rt.6

Popes Island

New Bedford Harbor

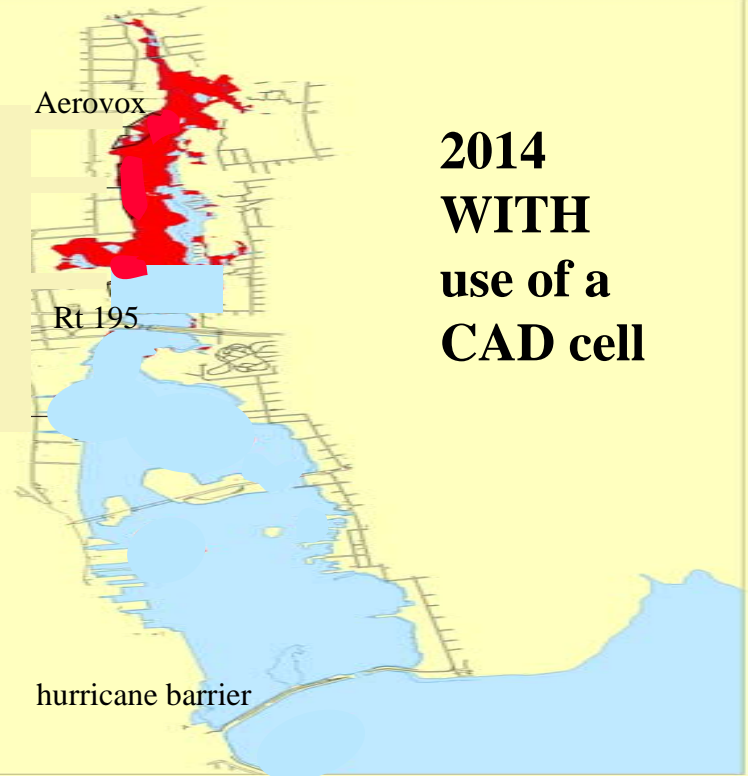
hurricane barrier

**2014
WITHOUT
use of a
CAD cell**



The lower harbor cleanup would be accelerated with a CAD cell

**2014
WITH
use of a
CAD cell**



Red areas are sediments requiring Superfund dredging. Assumes a typical \$15 million annual funding rate.

A CAD cell would be faster and less costly

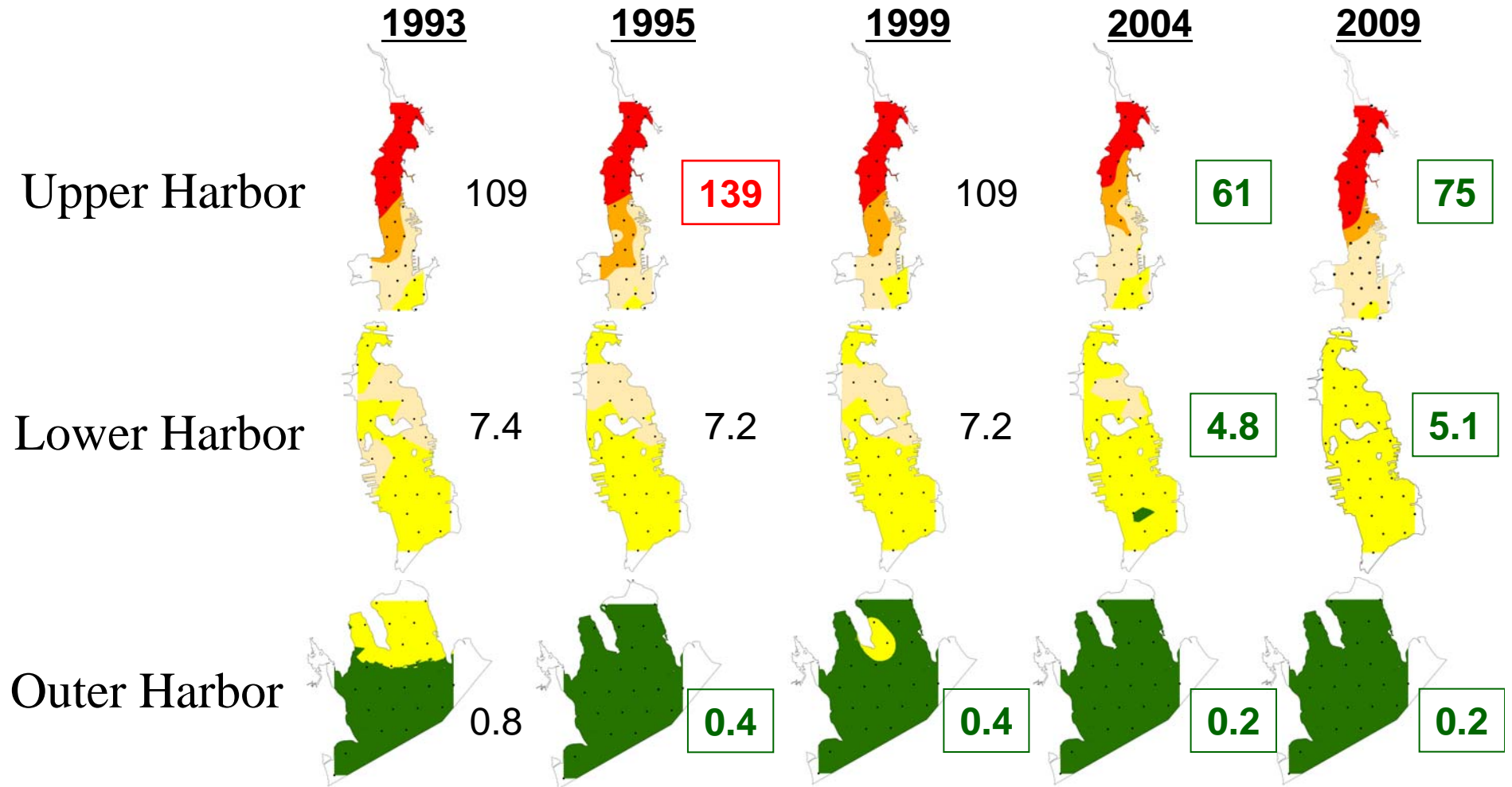
Funding Level	Time to Complete		Cost to Complete*	
	Current Remedy	ESD Remedy	Current Remedy	ESD Remedy
\$15 m/yr	46 yrs	40 yrs	\$1.7B	\$1.2B
\$30 m/yr	40 yrs	26 yrs	\$1.2B	\$767m
\$80 m/yr	7 yrs	6 yrs	\$536m	\$422m

*assuming 3.5% annual inflation

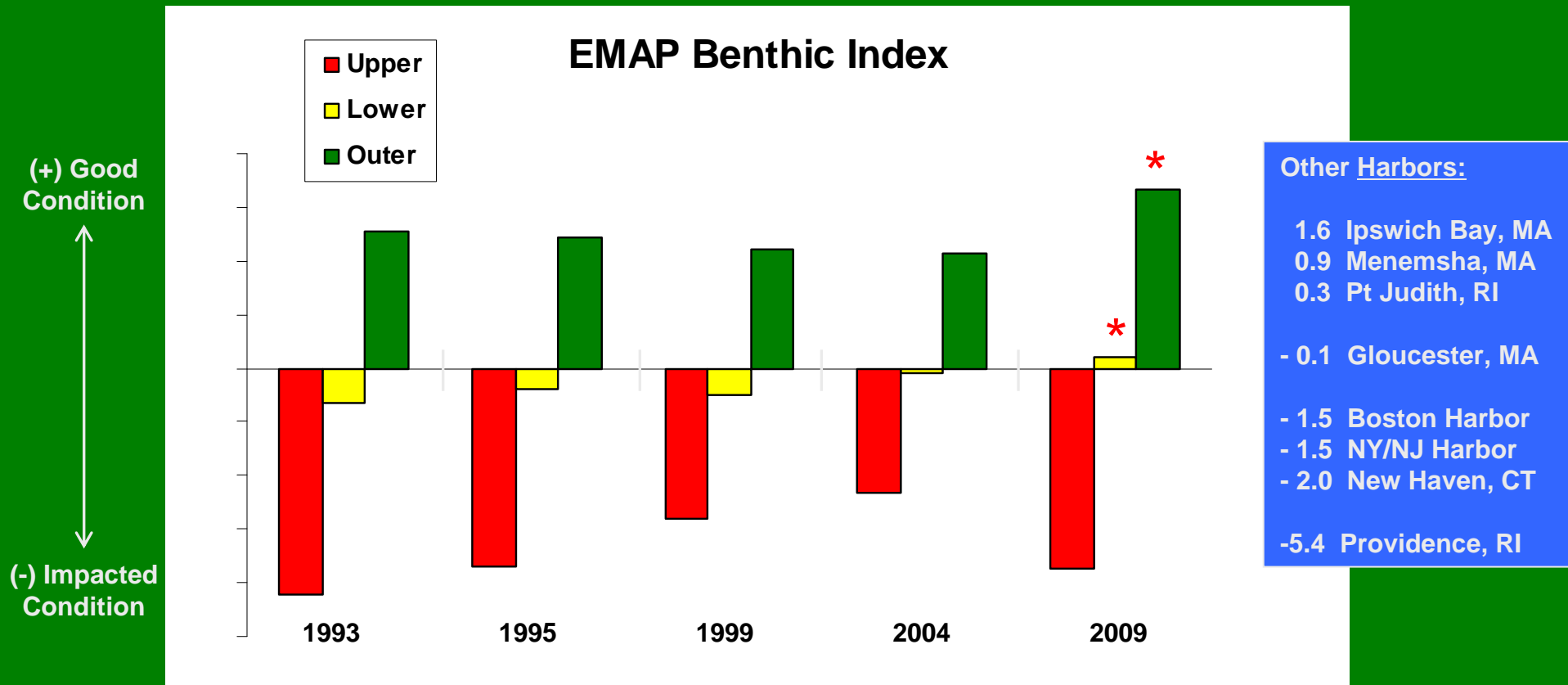
If the lower harbor is cleaned up before the upper harbor, won't it become recontaminated during upper harbor dredging?



Contamination of lower harbor from upper harbor dredging has NOT been observed to date



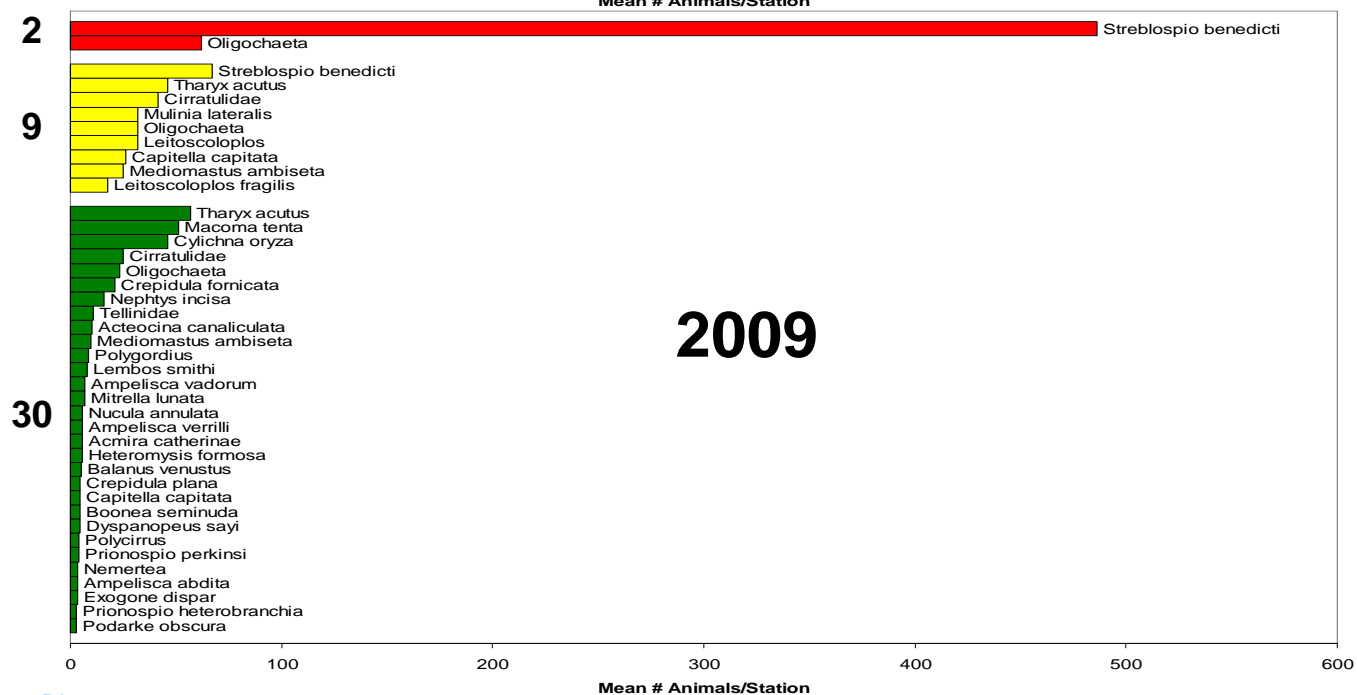
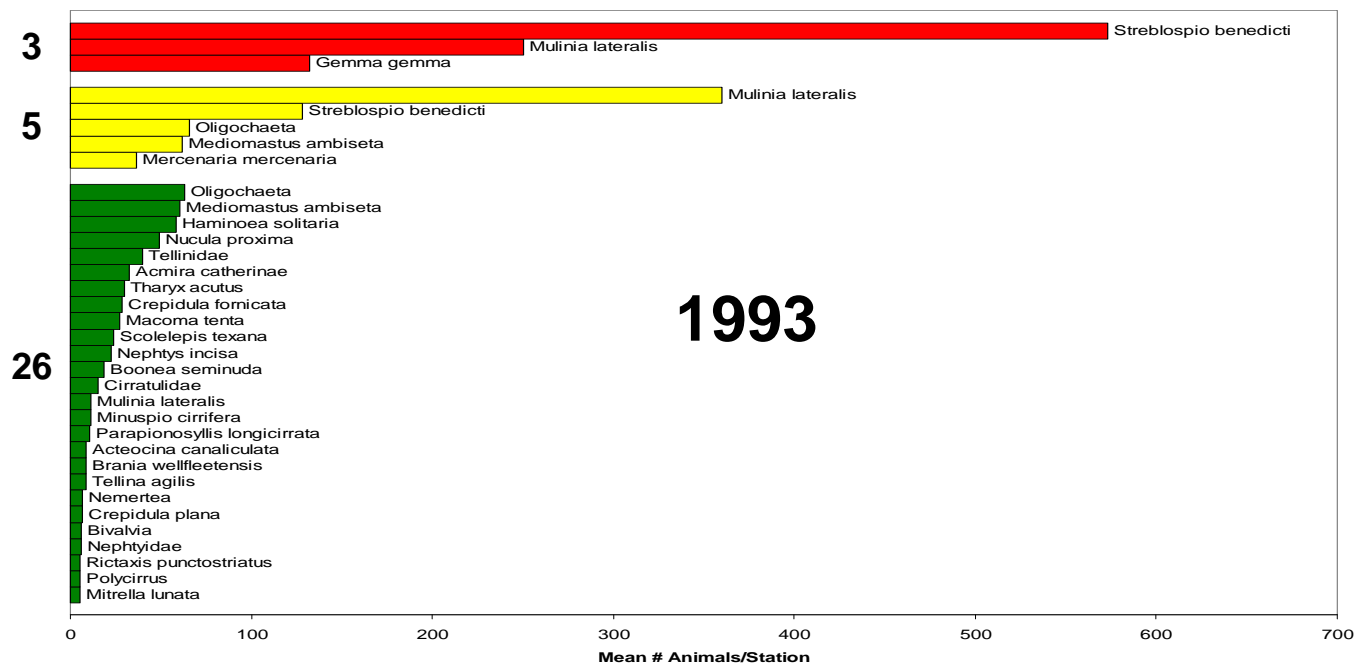
Benthic quality index: lower harbor quality improving since 1993





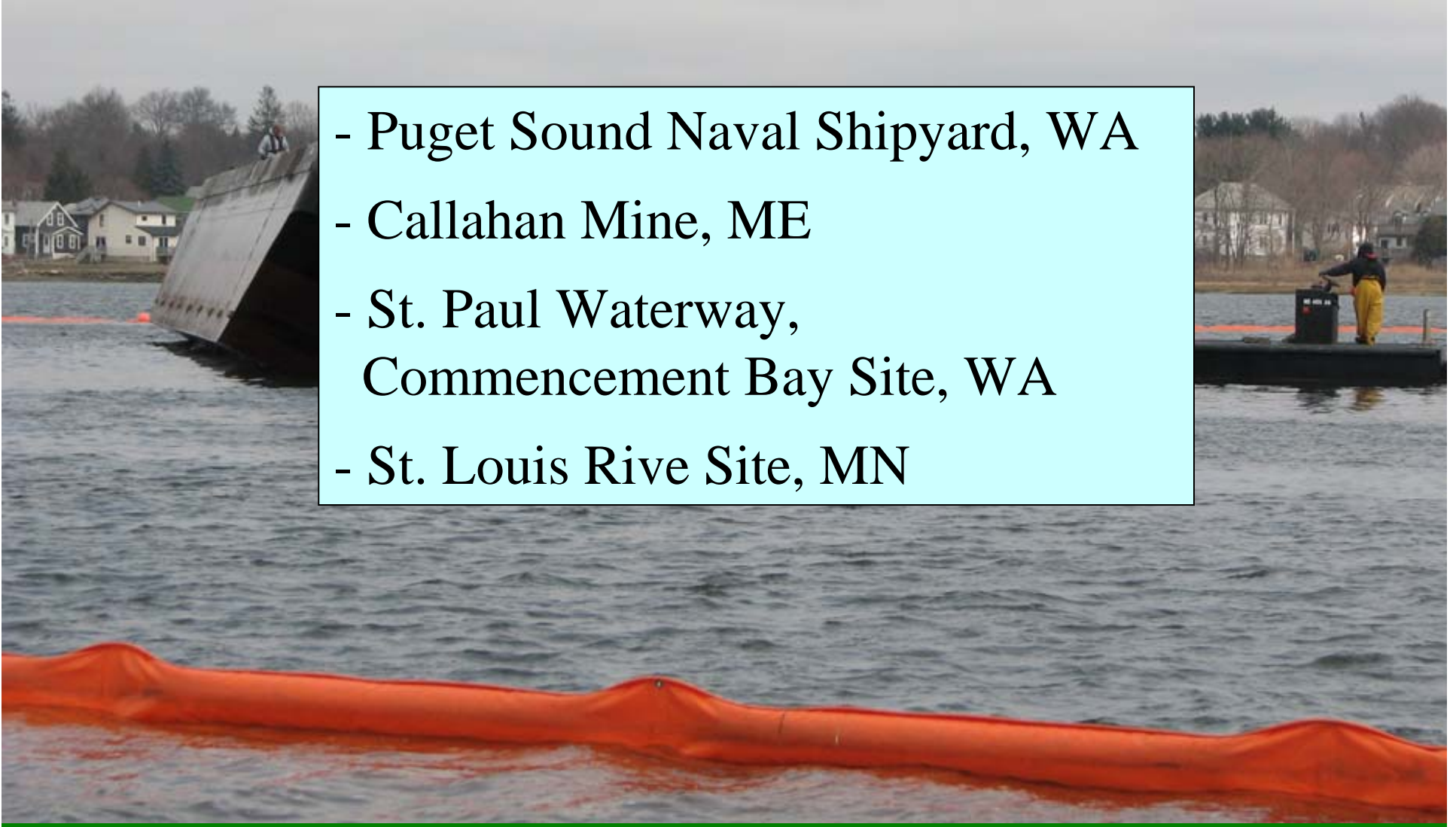
Benthic Community Comparison

Another indication that the lower harbor quality is improving even as the upper harbor is dredged

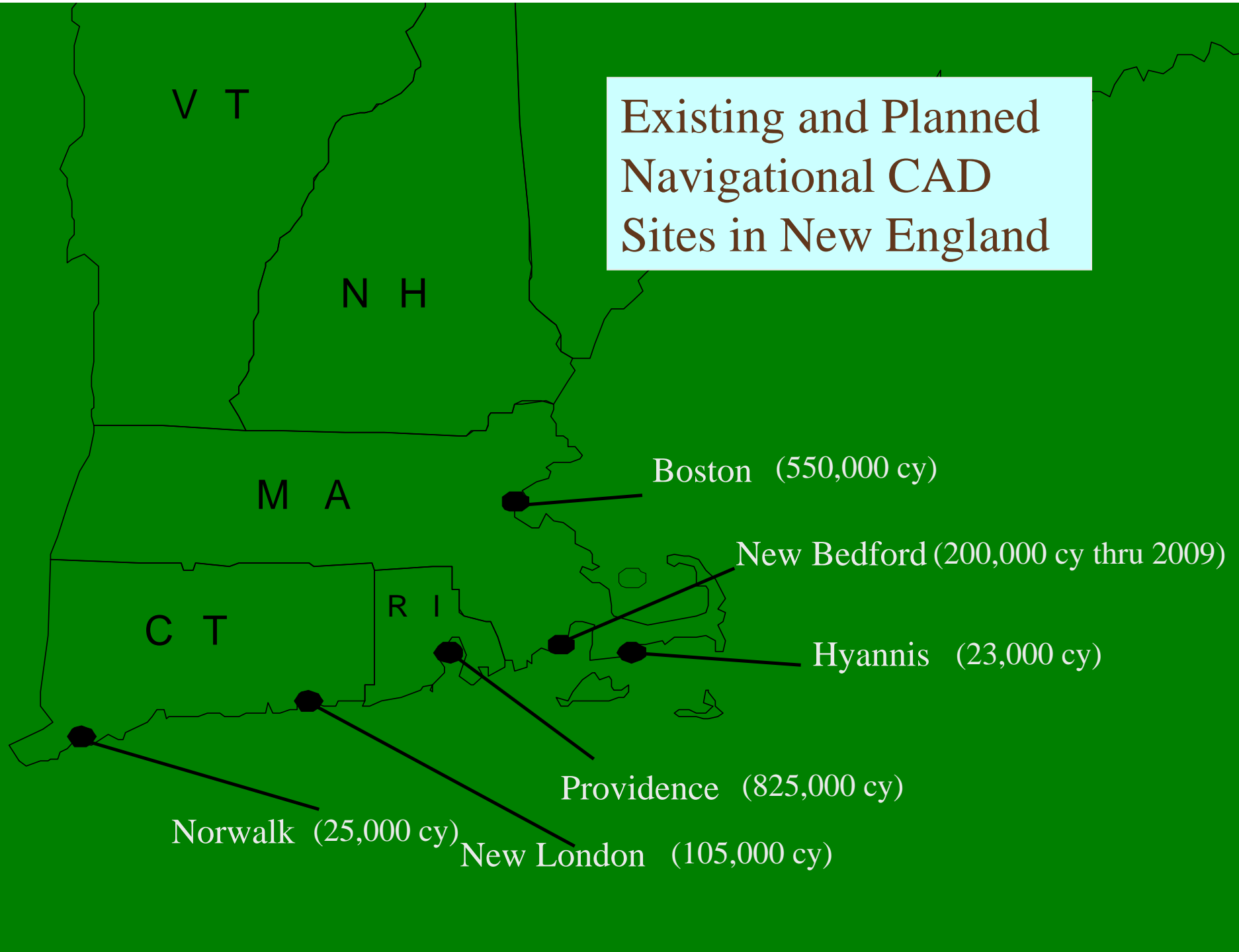


Other Superfund Sites that have selected CAD cells:

- Puget Sound Naval Shipyard, WA
- Callahan Mine, ME
- St. Paul Waterway,
Commencement Bay Site, WA
- St. Louis Rive Site, MN



Existing and Planned Navigational CAD Sites in New England



Potential Synergy With Other Harbor Dredging

850,000 cy non-federal navigational dredging
(wharf and pier areas, etc.)

450,000 cy federal navigational dredging
("unsuitable" material from main channels)

300,000 cy proposed Superfund CAD material

A few larger CAD cells would likely be less costly and have less environmental impact than many smaller CAD cells

07/10/2005 09:33:01

Questions?



REPOSITORY TARGET SHEET

US EPA New England
Superfund Document Management System /
RCRA Document Management System
Native Files Target Sheet

SDMS / RDMS Document ID #: 299754 _____

Site Name: **NEW BEDFORD**

File Break: 13.04 _____

File Type(s) Attached Specify below (Example: Excel file or .jpg):

Powerpoint file (.ppt) _____

Document Type this Target Sheet Represents:

- Map Photograph Graph/Chart
 Video Compact Disc Other (Specify below)

Public Meeting Presentation Slides _____

Description or Comments:

Native file format for June 2010 Public Meeting Presentation. File name: 2010.june.pub.mtg.ppt

To view the attached files, click on the “Attachment Panel”

**** Please note to view attachments the software corresponding with the specified file type is necessary. ****

For any additional assistance please contact the EPA New England Office of Site Remediation and Restoration Records and Information Center-
Telephone (617) 918 1440