



NEW BEDFORD FAIRHAVEN HARBOR



Three parts to tonight's presentation:

1. Navigational dredging update
2. Overview of CAD cells
3. EPA's evaluation of a Superfund CAD cell

hurricane barrier

Rt 195

Aerovox facility

An aerial photograph of a coastal region. In the foreground, there is a large, dark, irregularly shaped area labeled 'Aerovox facility'. A road, labeled 'Rt 195', runs through the middle ground. In the background, a long, narrow strip of land extends into the water, labeled 'hurricane barrier'. The surrounding area is a mix of residential and commercial buildings, green spaces, and water bodies.



Cornell-Dubilier

Second capacitor facility
in outer harbor

Aerovox

Electronic
capacitor facility
released an estimated 275
tons of PCBs from the
1940s to the 1970s

Part 3 - evaluation of a Superfund CAD cell

the upper harbor, looking north

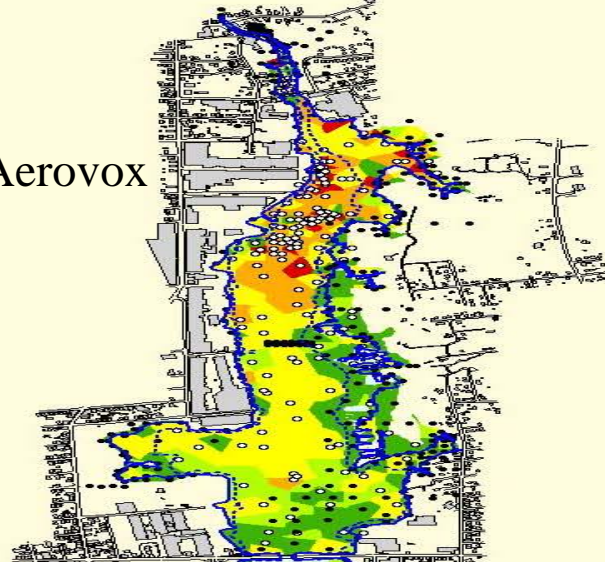
Aerovox



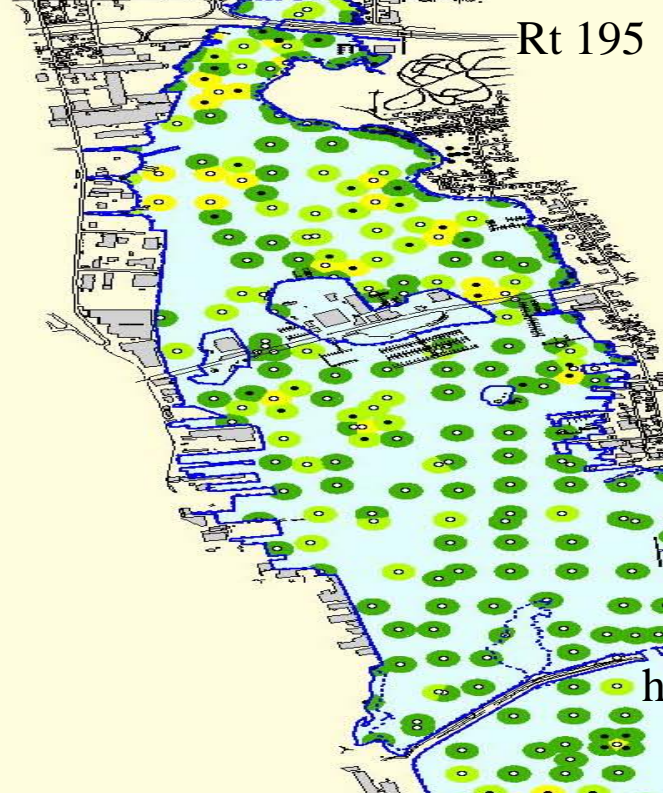
11/10/2003



Aerovox








Rt 195



hurricane barrier

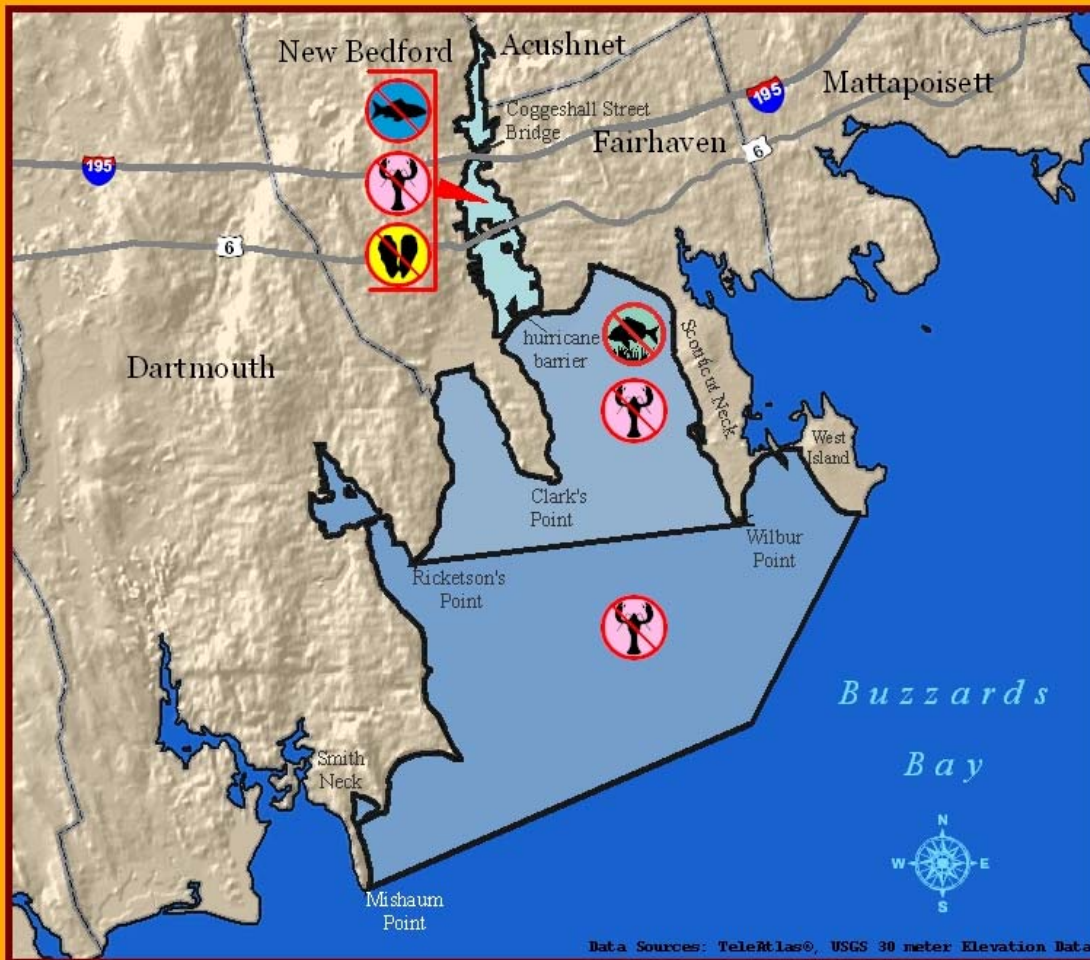
Cornell-Dubilier

Color coded sediment PCB levels
(prior to dredging)

-  > 4,000 ppm
-  501 to 4,000 ppm
-  51 to 500 ppm
-  10 to 50 ppm
-  <10 ppm

2000 0 2000 Feet

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
- tautog
- tautoga
- bodião da ostra
- scup
- sargo
- sargo
- eel
- anguila
- anguila



Do NOT eat any shellfish

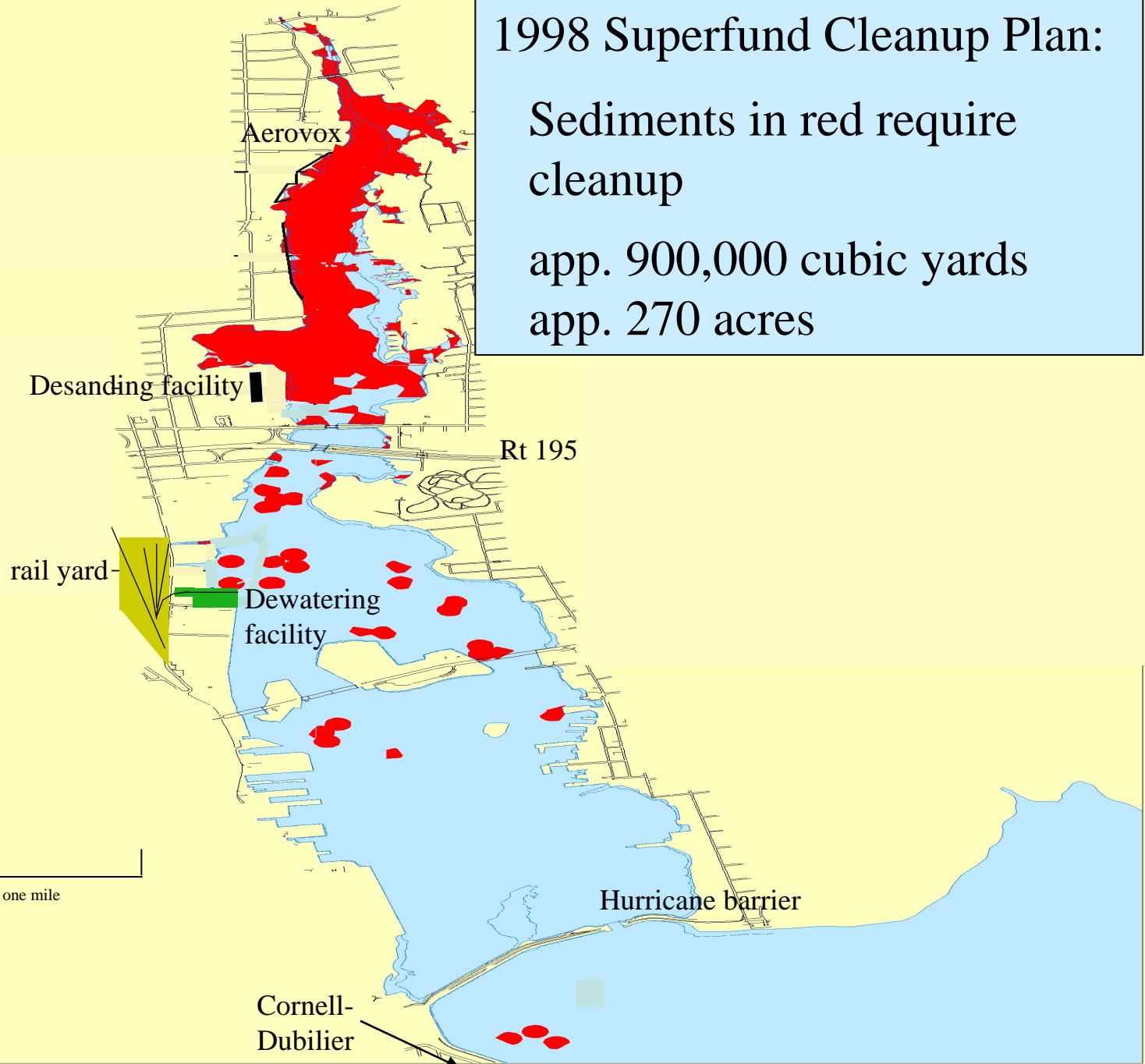
No coma mariscos
Não coma mariscos

1998 Superfund Cleanup Plan:

Sediments in red require
cleanup

app. 900,000 cubic yards

app. 270 acres

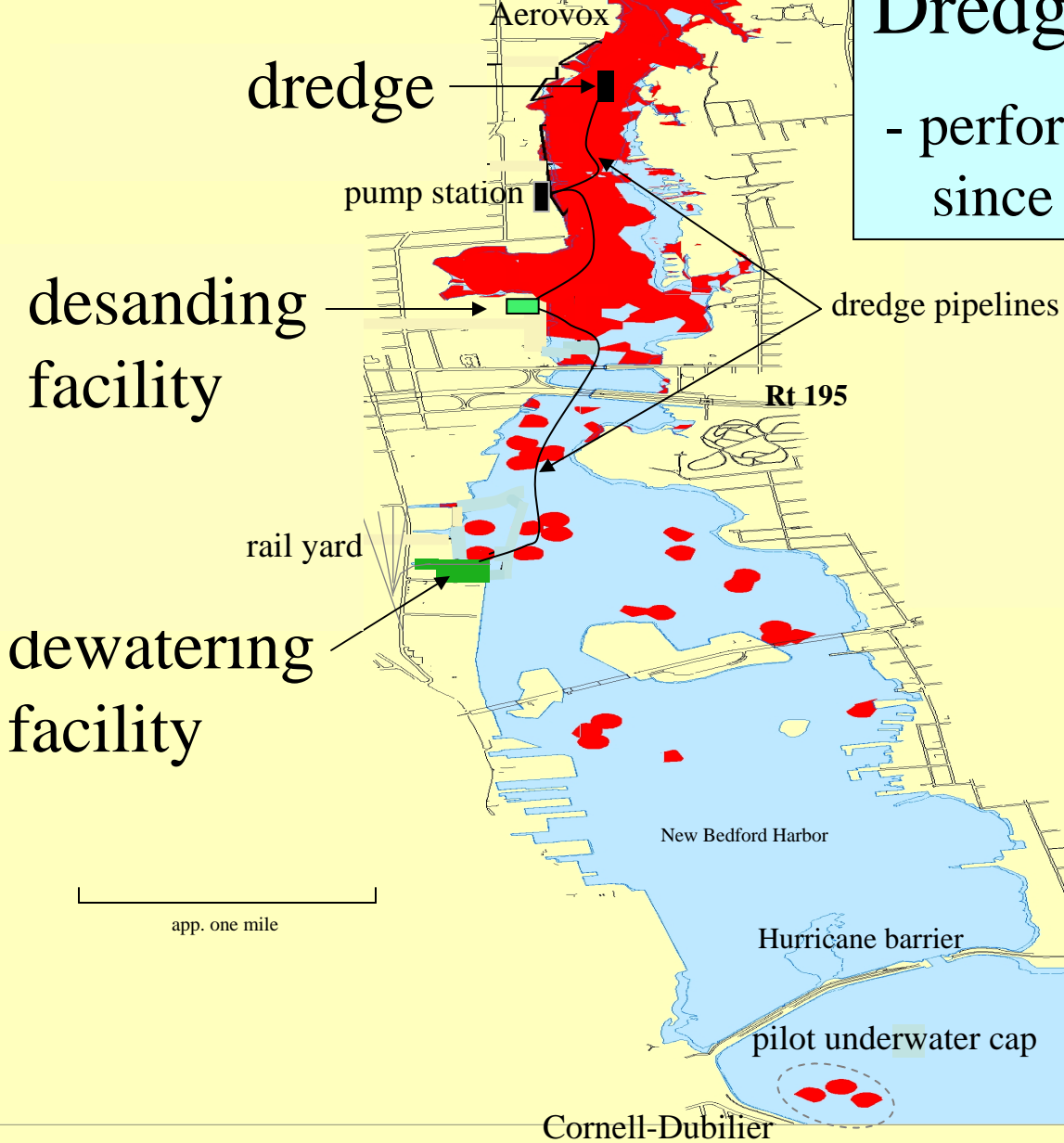


River banks also need cleanup and restoration in addition to sediments



Superfund Full Scale Dredging Process

- performed annually
since 2004



1. Dredging in upper harbor



2. Desanding



Superfund dredging and disposal operations

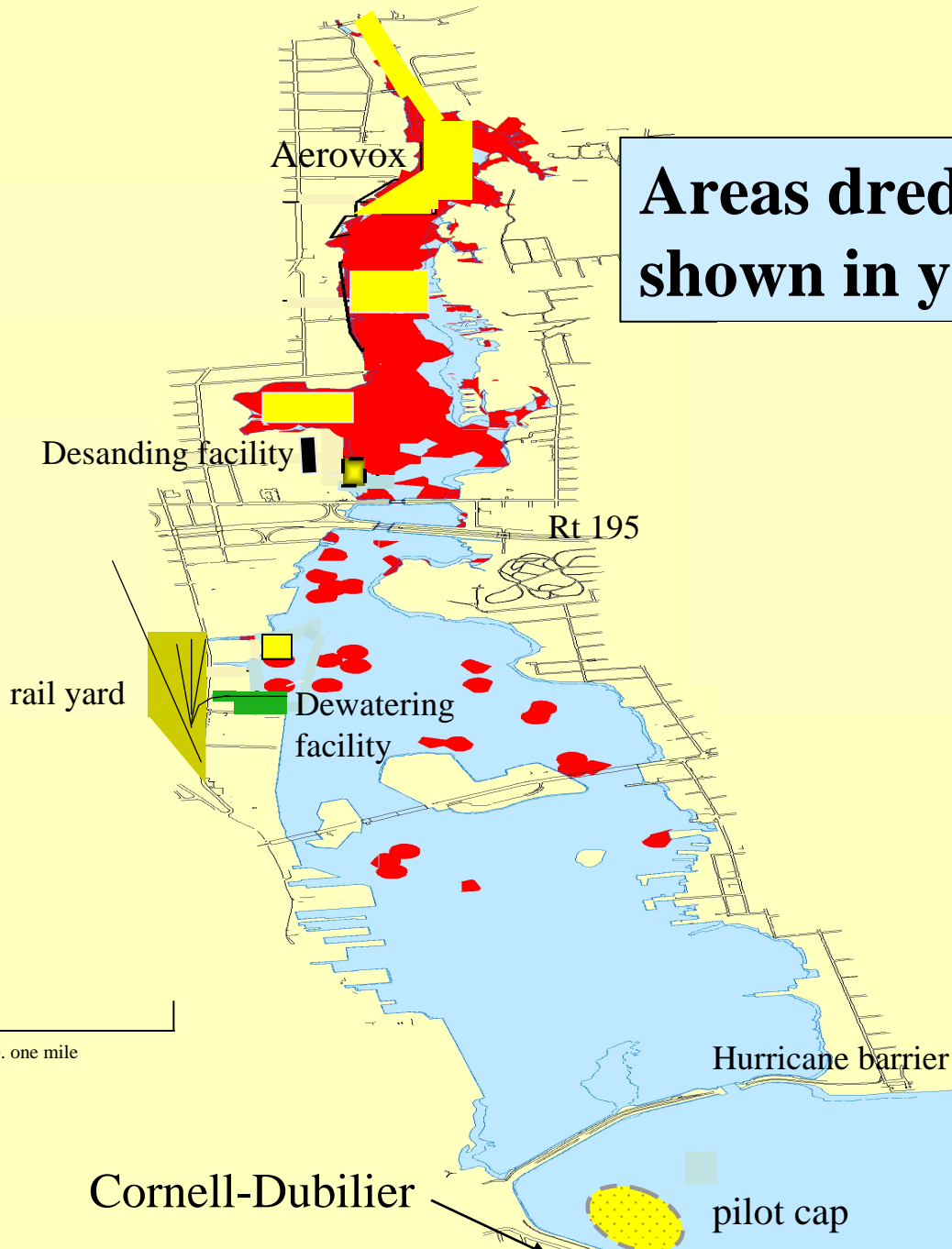
3. Dewatering



4. Loading to rail for offsite disposal



**Areas dredged to date
shown in yellow**



app. one mile

Cornell-Dubilier

Hurricane barrier

pilot cap

rail yard

Dewatering
facility

Desanding facility

Rt 195

Aerovox

Latest DRAFT Estimates of Time and Cost to Complete* (100% Offsite Disposal)

<u>Annual funding level</u>	<u>Years to complete</u>	<u>Cost to complete</u>
→ \$15 million	42	\$1,389 million
\$30 million	27	\$827 million
\$80 million	6	\$417 million

*3.5% annual inflation assumed

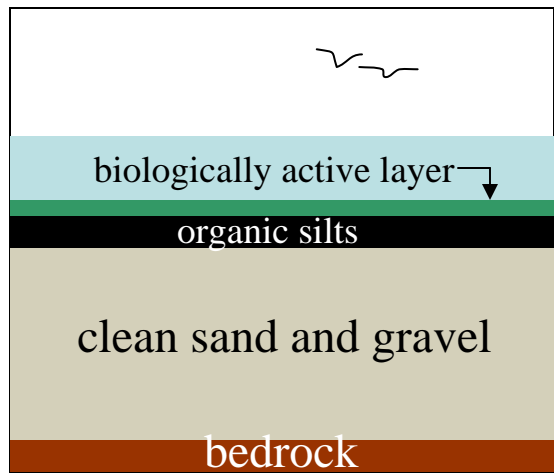
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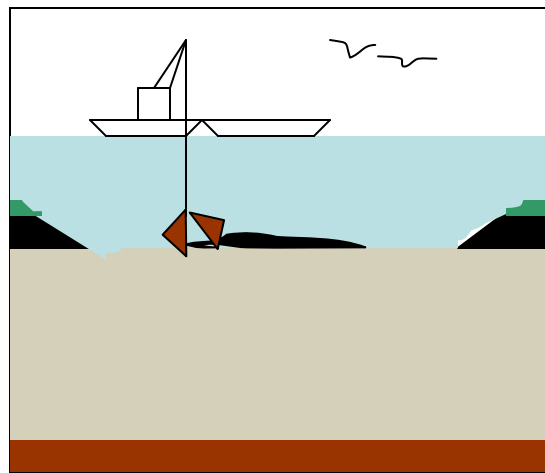
DRAFT

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

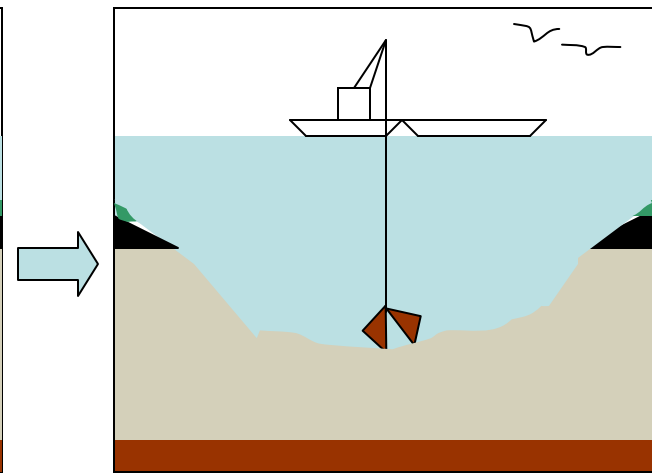




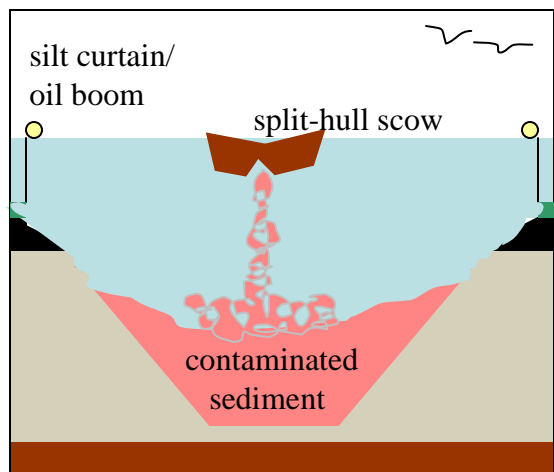
1. Harbor bottom as is



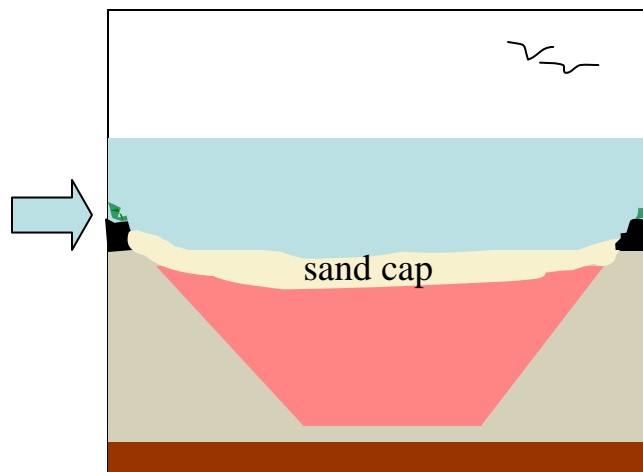
2. Excavation of top silts



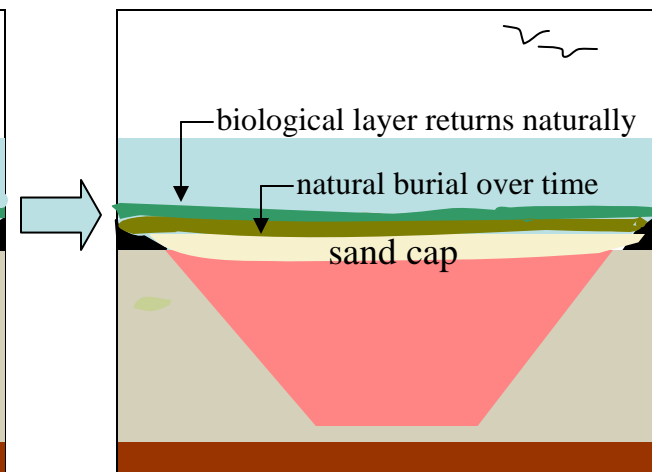
3. Excavation of clean sand



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 ?

Rt.195

State-approved area for navigational CAD cells

Rt.6

Popes Island

New Bedford Harbor






hurricane barrier

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



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

Rt 195

Rt 6

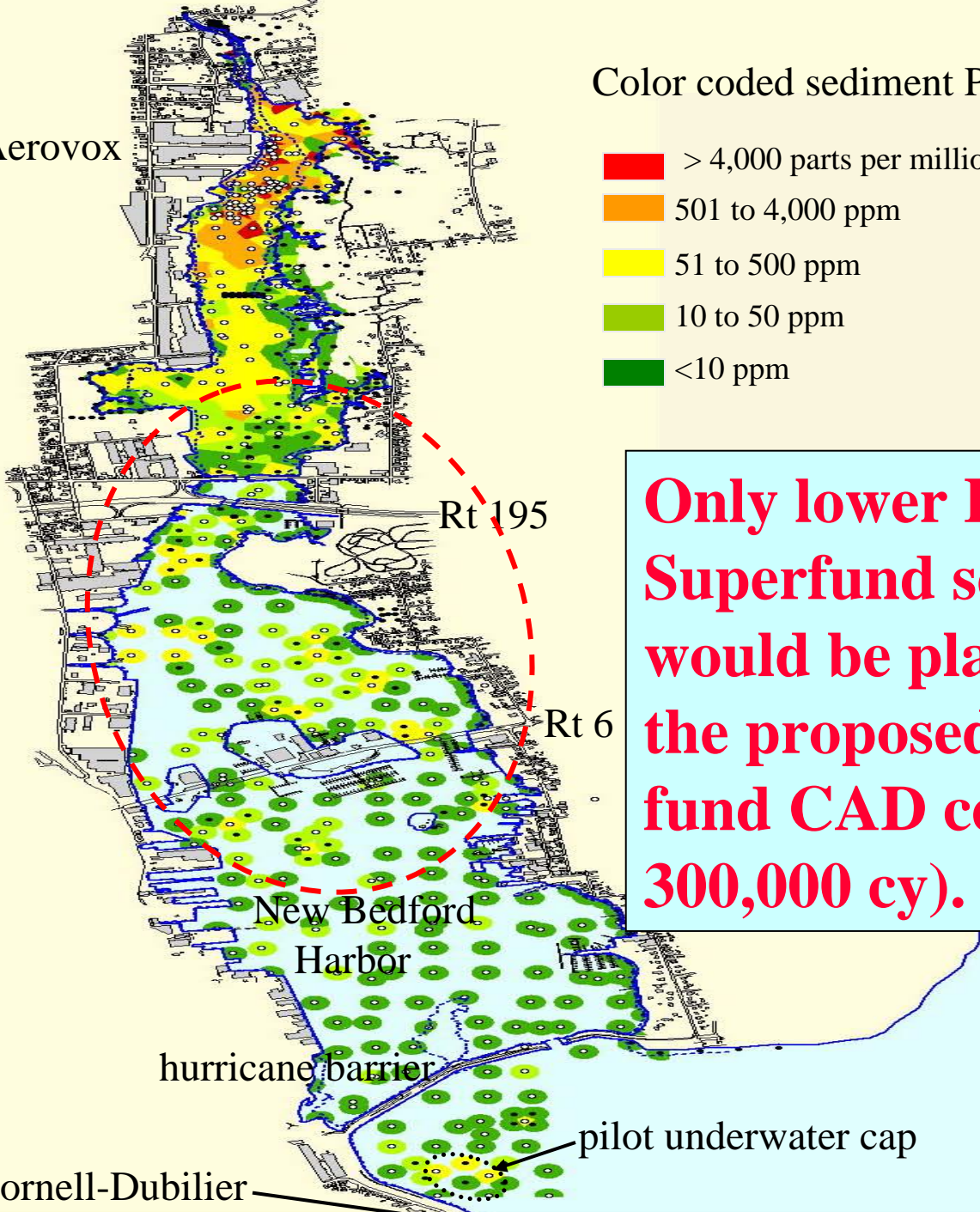
Only lower PCB level Superfund sediment would be placed in the proposed Superfund CAD cell (app. 300,000 cy).

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

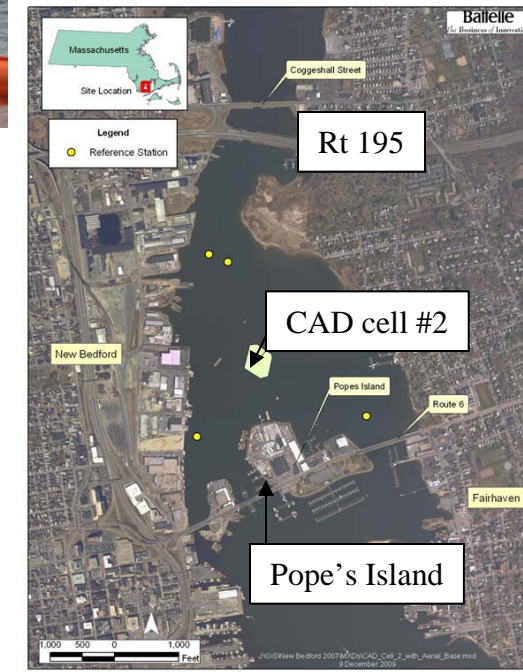
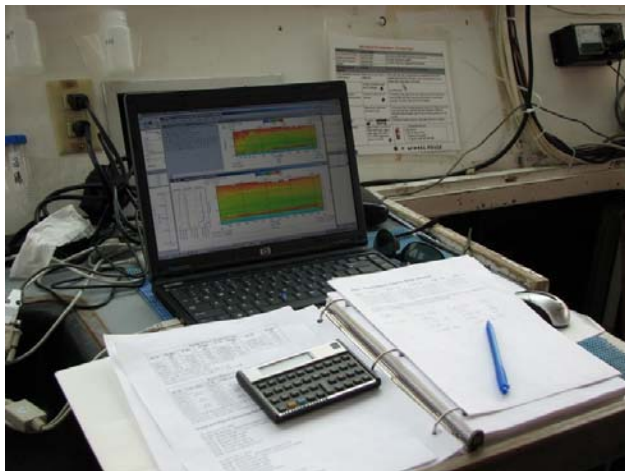
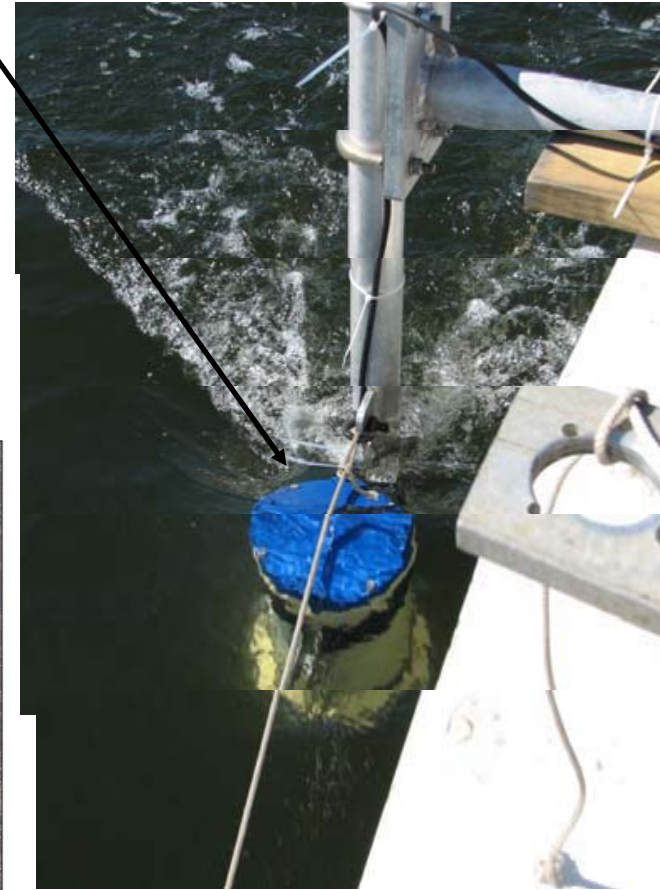
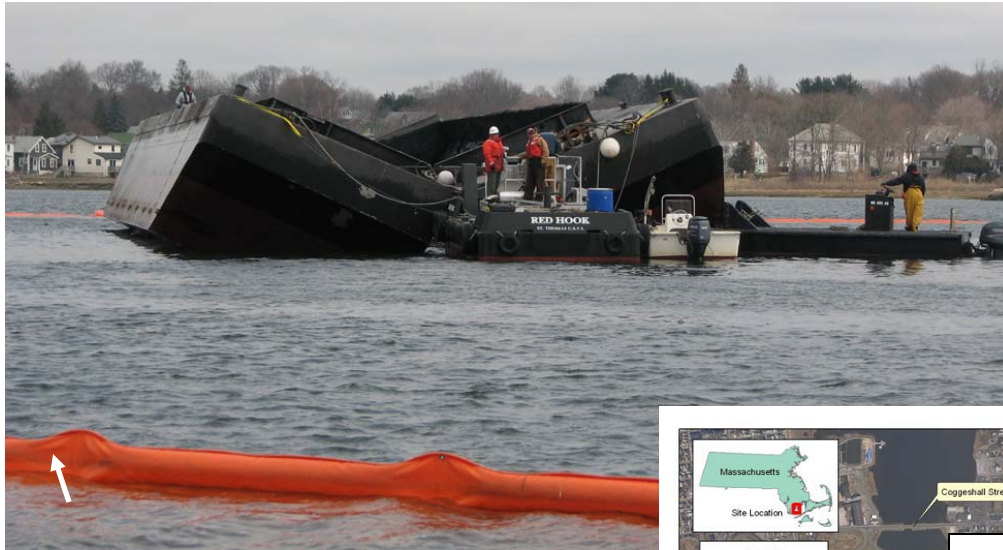
A2: the same monitoring found NO toxicity

A3: short and long term computer modeling

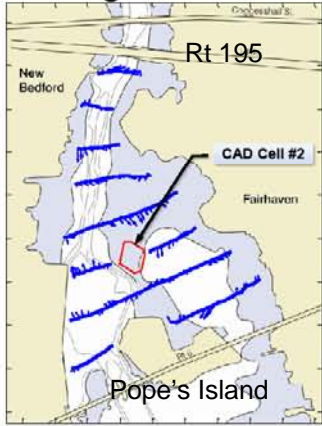
A4: performance standards would be used

Water Quality Monitoring of Navigational CAD Cell #2

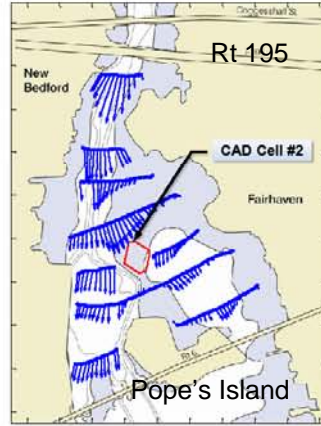
Acoustic Doppler Current Profiler



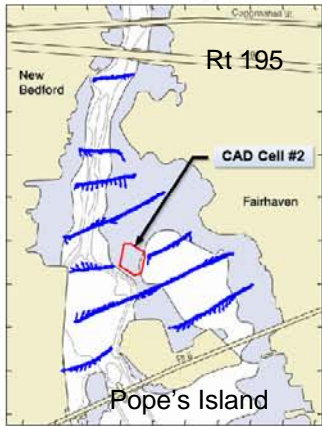
High Slack



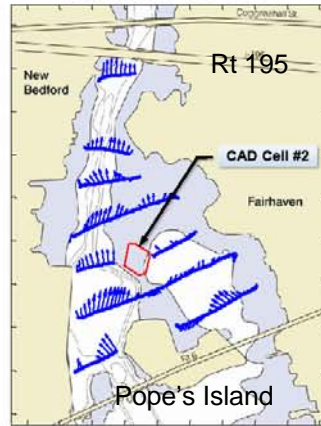
Max Ebb



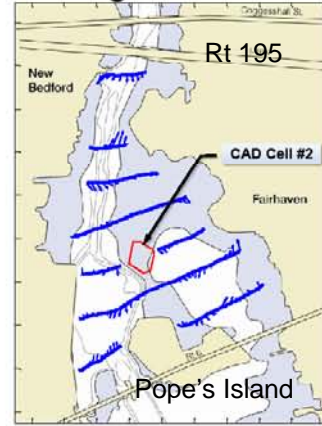
Low Slack



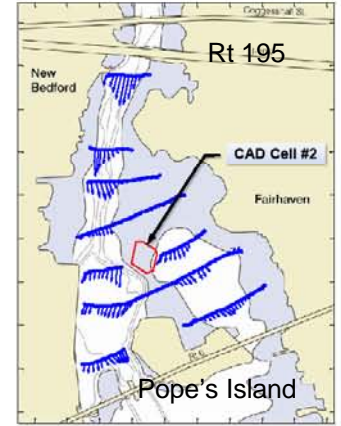
Max Flood



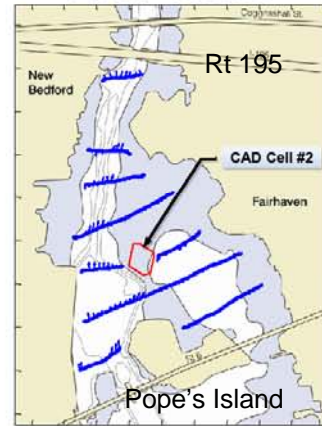
High Slack



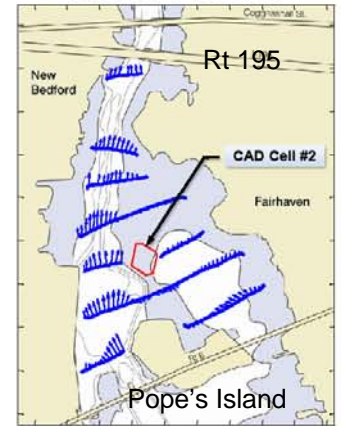
Max Ebb



Low Slack



Max Flood

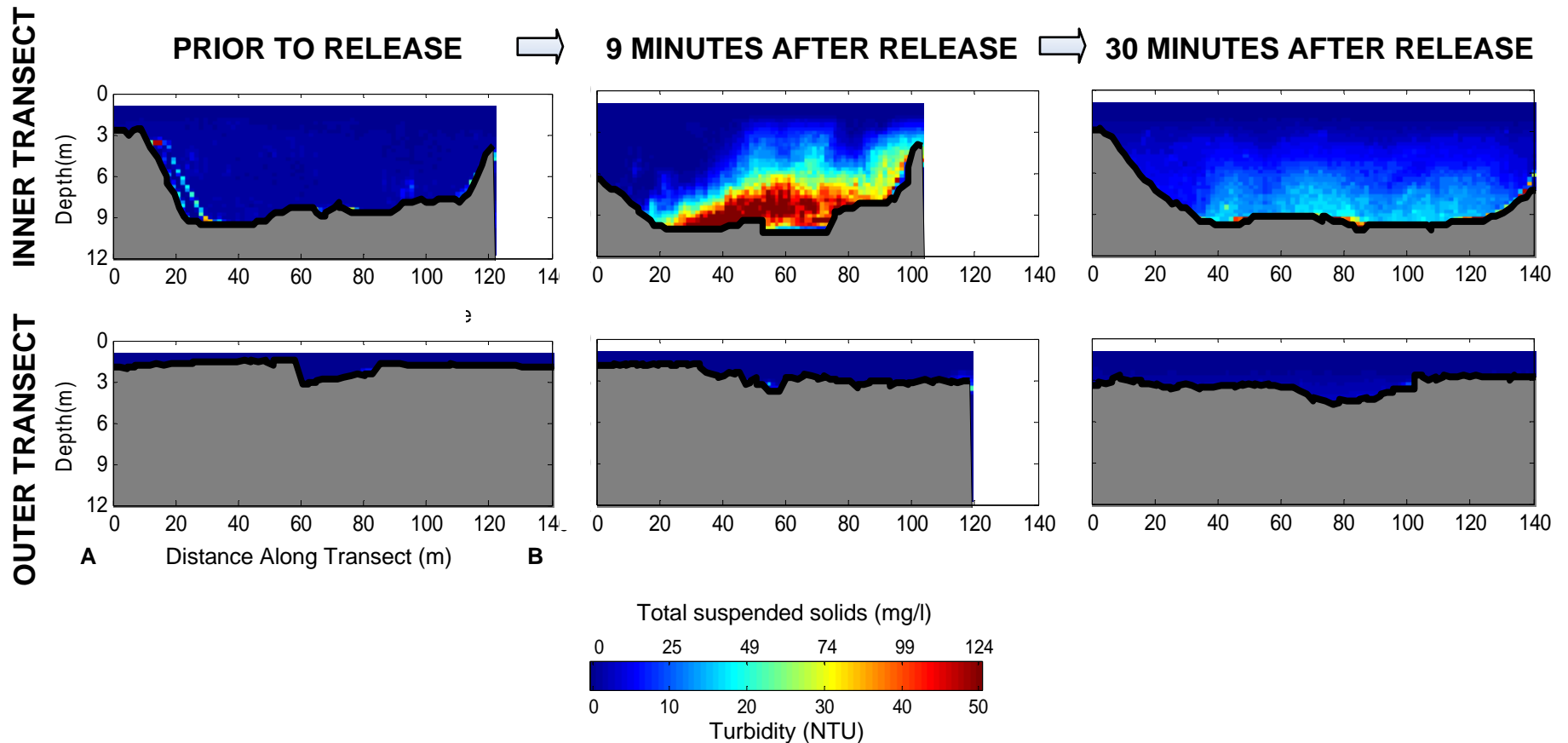
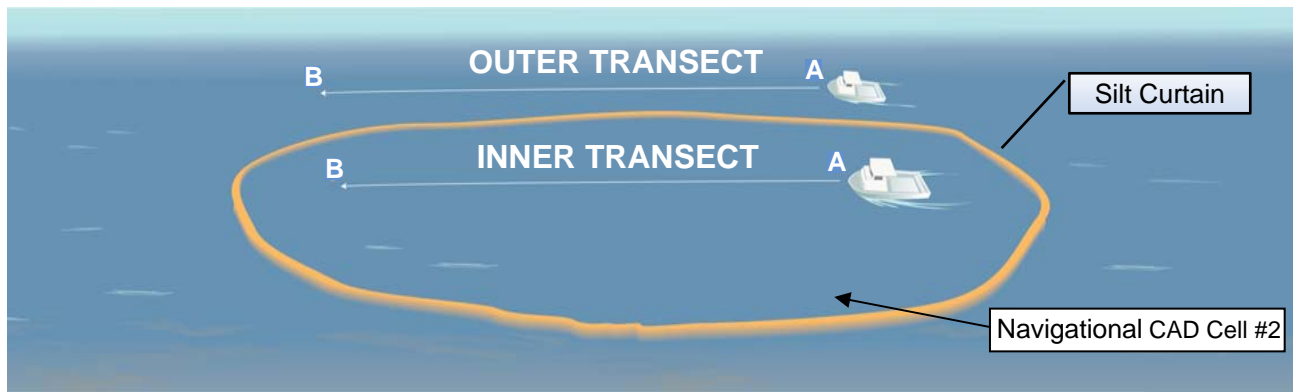


Surface Currents

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 9 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 9 pounds is about 0.06% 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.

By comparison, current day-to-day migration of PCBs from the upper to the lower harbor is about **9 pounds every ten days**.



Results of computer modeling of CAD cell

A CAD cell would be faster and less costly

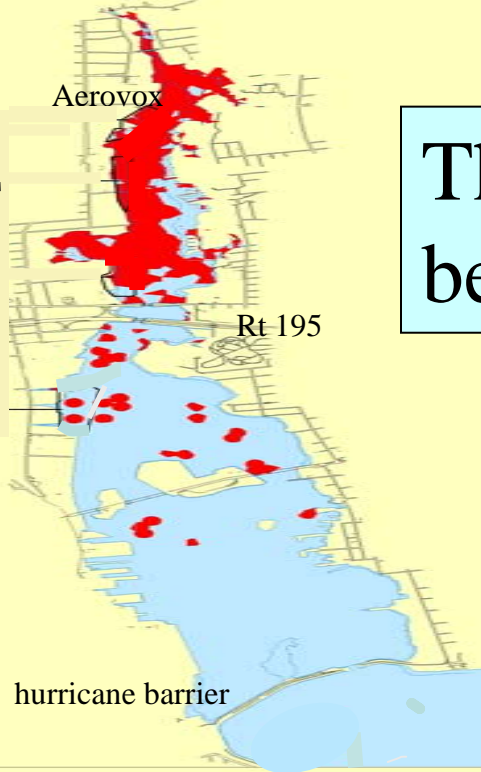
Time to Complete

Cost to Complete*

Funding Level	Time to Complete		Cost to Complete*	
	With CAD	100% Offsite	With CAD	100% Offsite
\$15 m/yr	35 yrs	42 yrs	\$983m	\$1,389m
\$30 m/yr	20 yrs	27 yrs	\$592m	\$827m
\$80 m/yr	5 yrs	6 yrs	\$369m	\$417m

*assuming 3.5% annual inflation

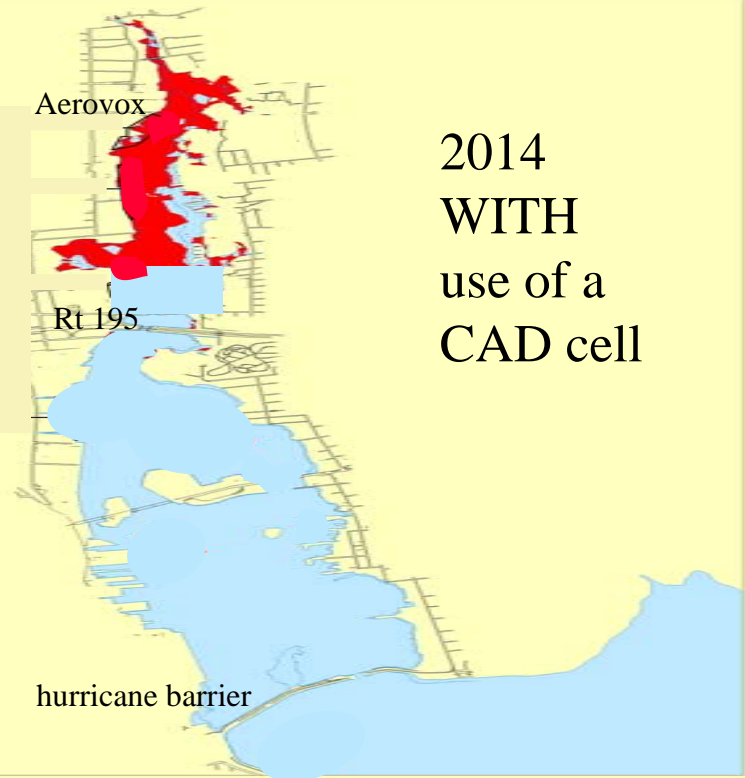
2014
WITHOUT
use of a
CAD cell



The lower harbor cleanup would be accelerated with a CAD cell

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

2014
WITH
use of a
CAD cell



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



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?

