

A satellite image of Earth showing a large river delta, likely the Amazon, with green and brown landmasses and a deep blue ocean. The text is overlaid on the image.

CERI - Terrestrial and Atmospheric Inputs

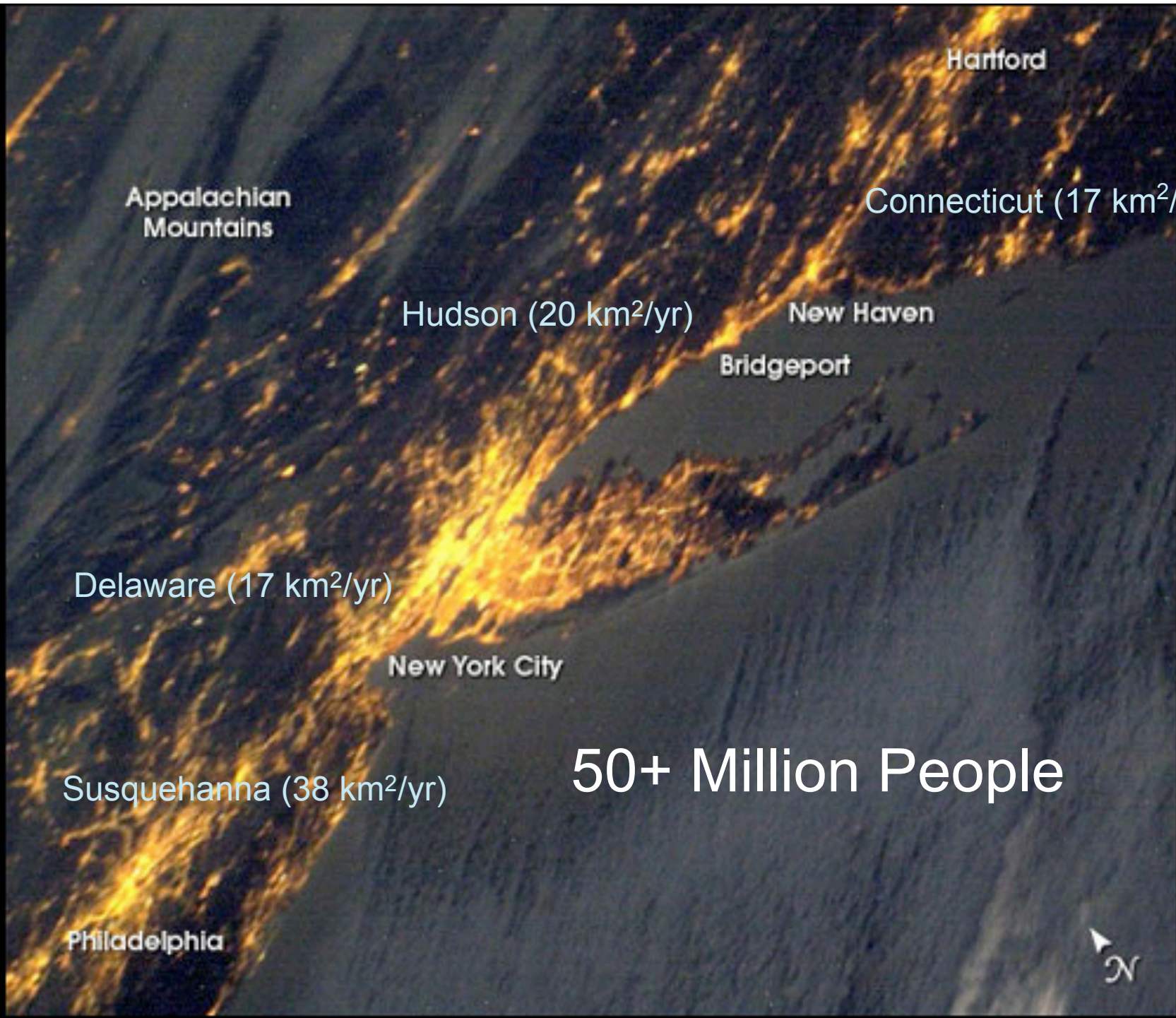
With contributions from:

Matt Charette

Rocky Geyer

Karl Lamborg

DeDe Toole.



Appalachian
Mountains

Hartford

Connecticut (17 km²/yr)

Hudson (20 km²/yr)

New Haven

Bridgeport

Delaware (17 km²/yr)

New York City

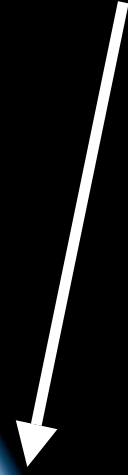
Susquehanna (38 km²/yr)

Philadelphia

50+ Million People



Export from East Asia: Dust and Contaminants



SeaWiFS, 04/20/01

Atmospheric Hg Impacts on the Coastal Zone (the Long Island Sound example)

sources
sinks

50% is from point and non-point sources, e.g., water treatment facilities.

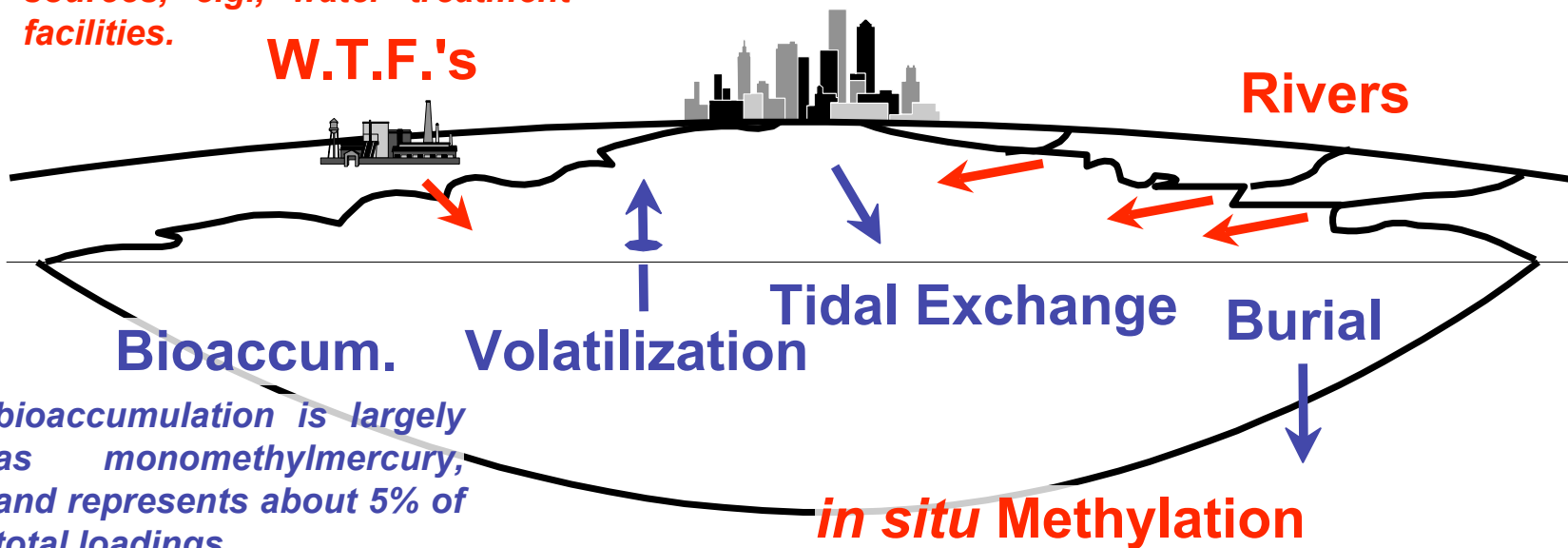
Direct Atmos.

Dep.

ca. 240 kg enters each year, 50% from atmospheric deposition to the watershed and Sound. less than a third enters as monomethylmercury.

W.T.F.'s

Rivers

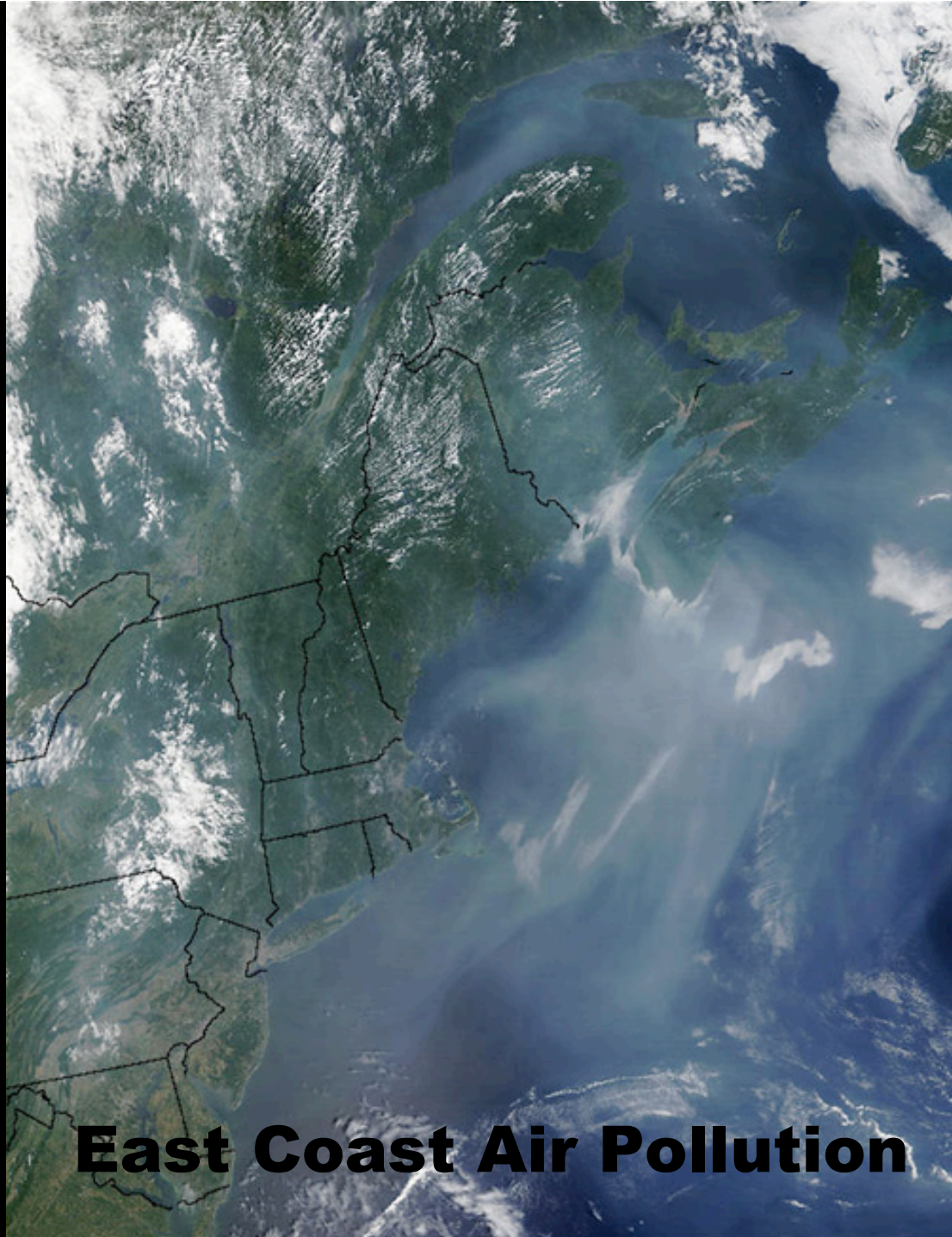


bioaccumulation is largely as monomethylmercury, and represents about 5% of total loadings.

in situ Methylation

most of the monomethylmercury accumulating in fish is formed in the Sound's sediments...in proportion to atmospheric loading

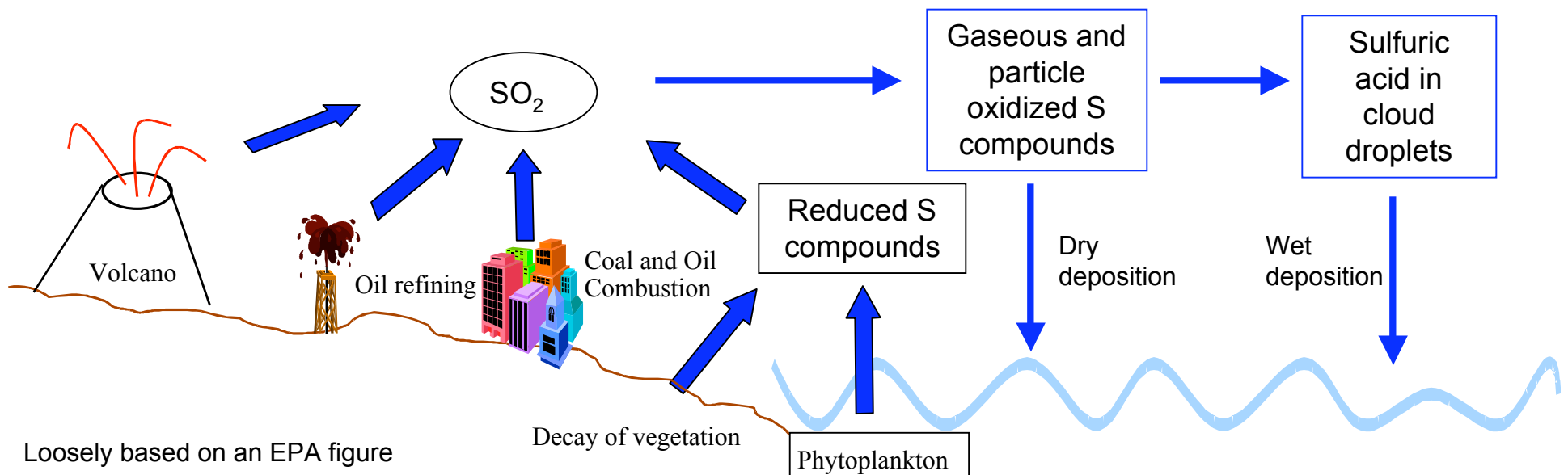
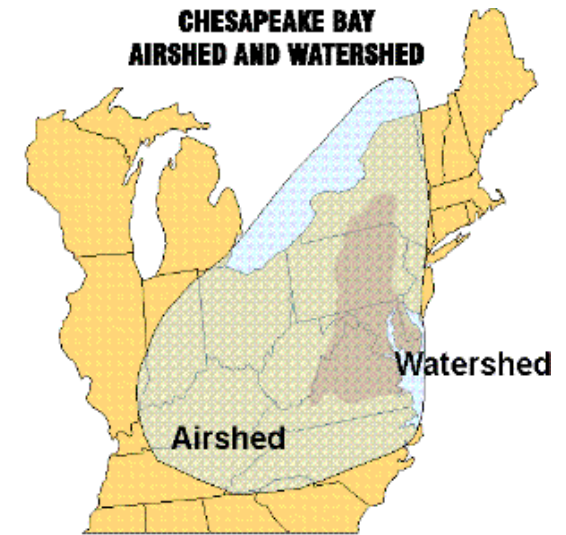
Balcom et al., 2005.

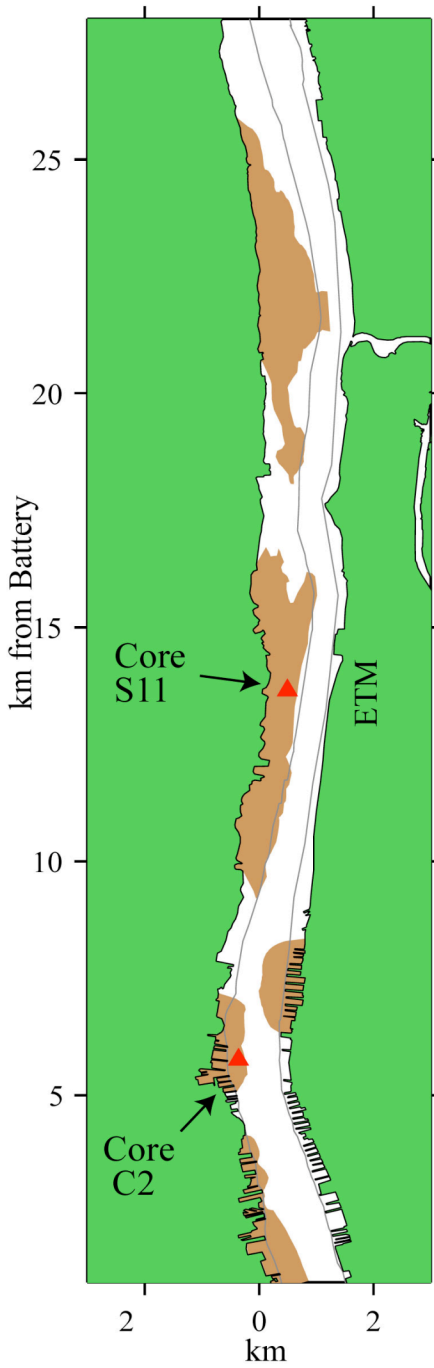


East Coast Air Pollution

Atmospheric sulfur deposition to the ocean

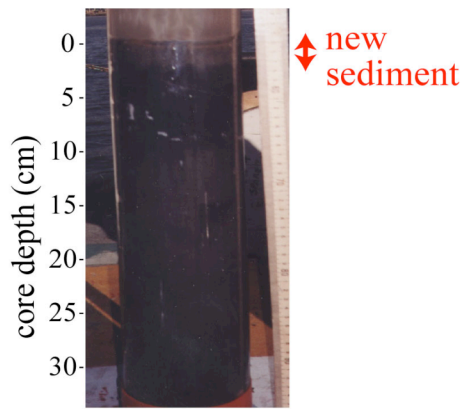
- Atmospheric sulfur compounds are deposited to the coastal ocean from emissions originating within their airshed
- Globally, sulfuric acid deposits are largest in coastal regions of the Eastern United States, Northern Europe, and Asia and are a significant source of acidity to lakes and inland water bodies



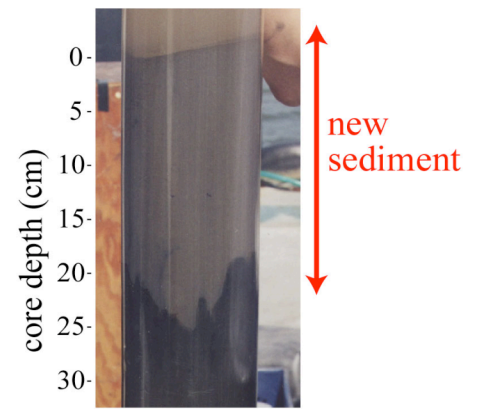


FRESHET → POST-FRESHET

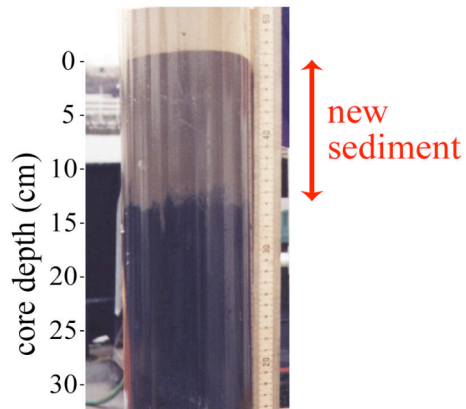
Core S11
April, 1999



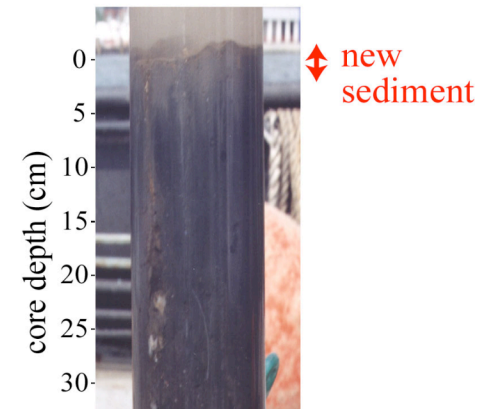
Core S11
June, 1999



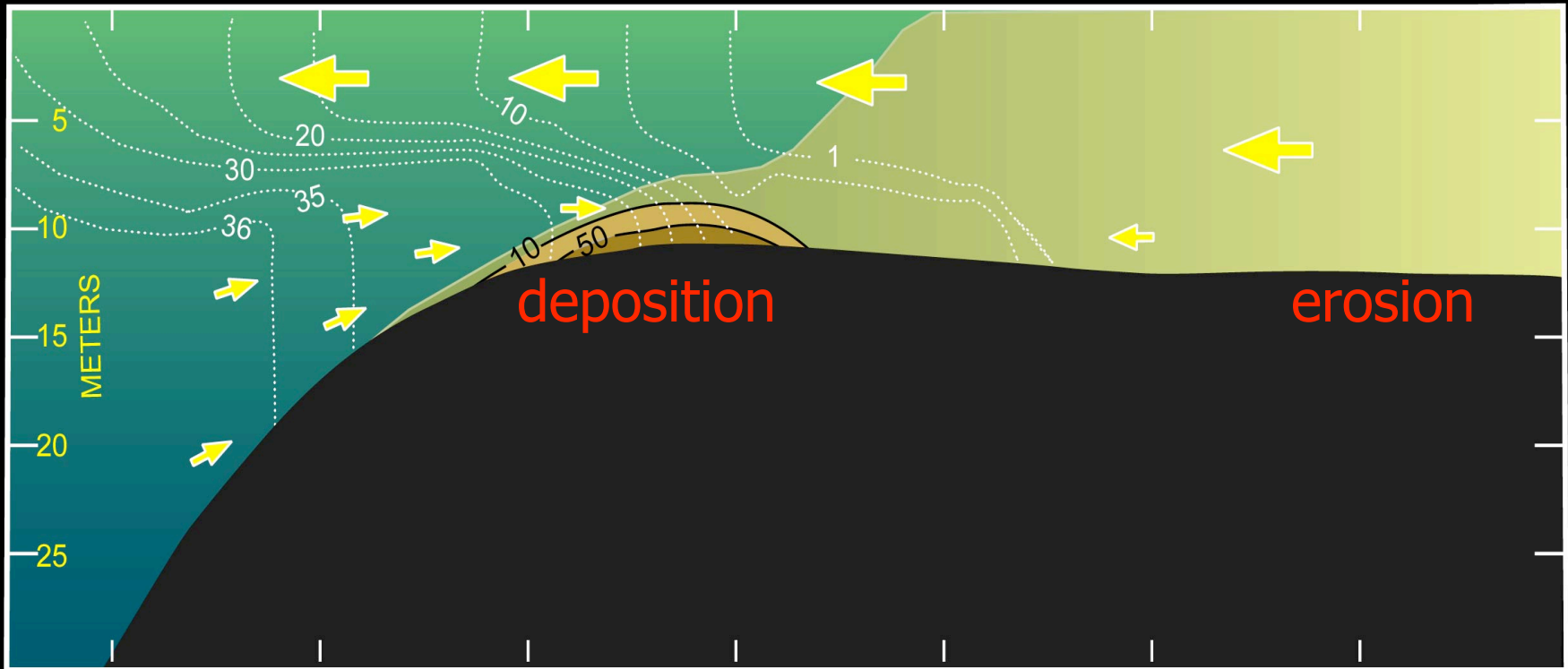
Core C2
April, 1999



Core C2
June, 1999



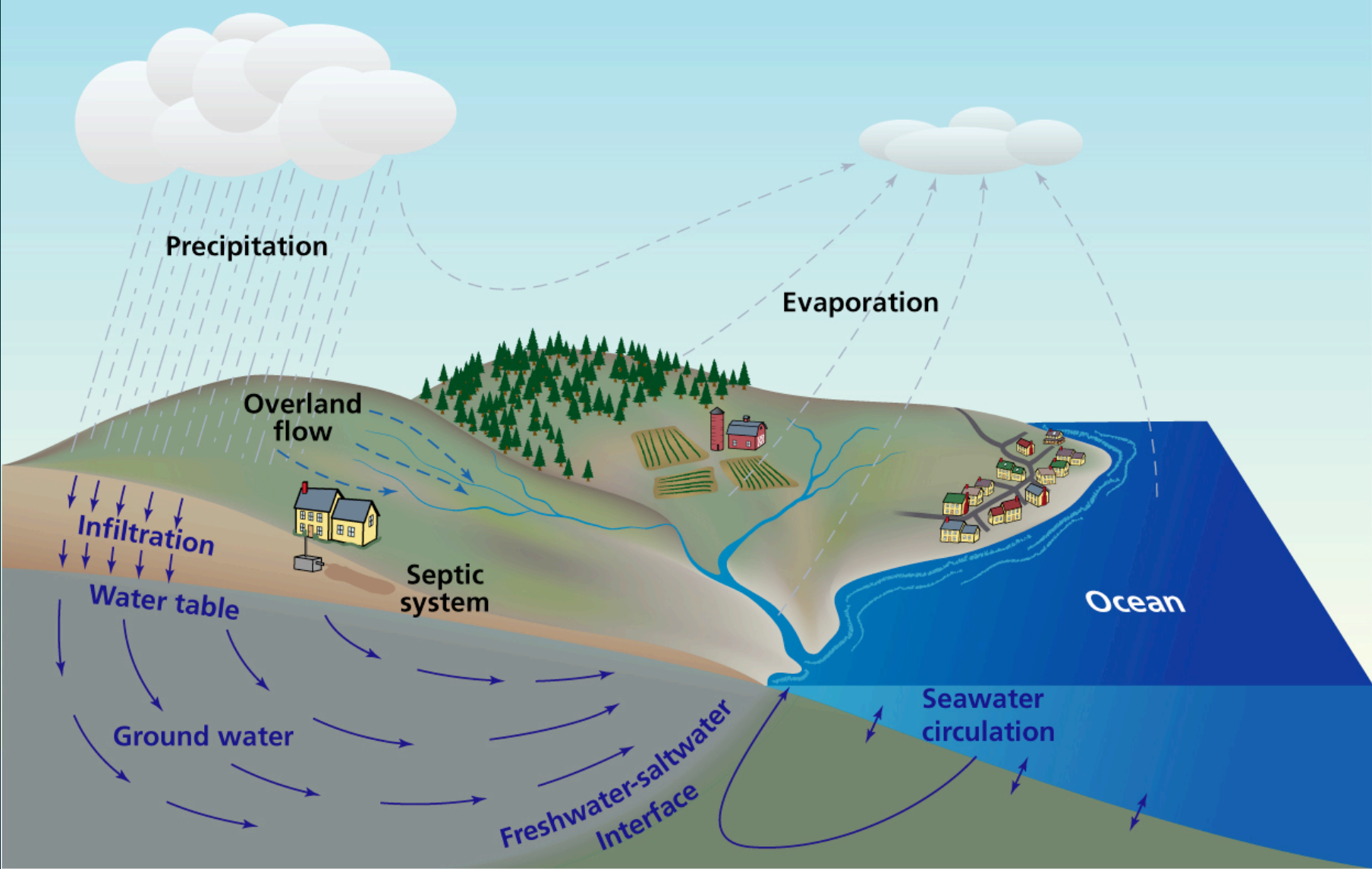
ESTUARINE TRAPPING



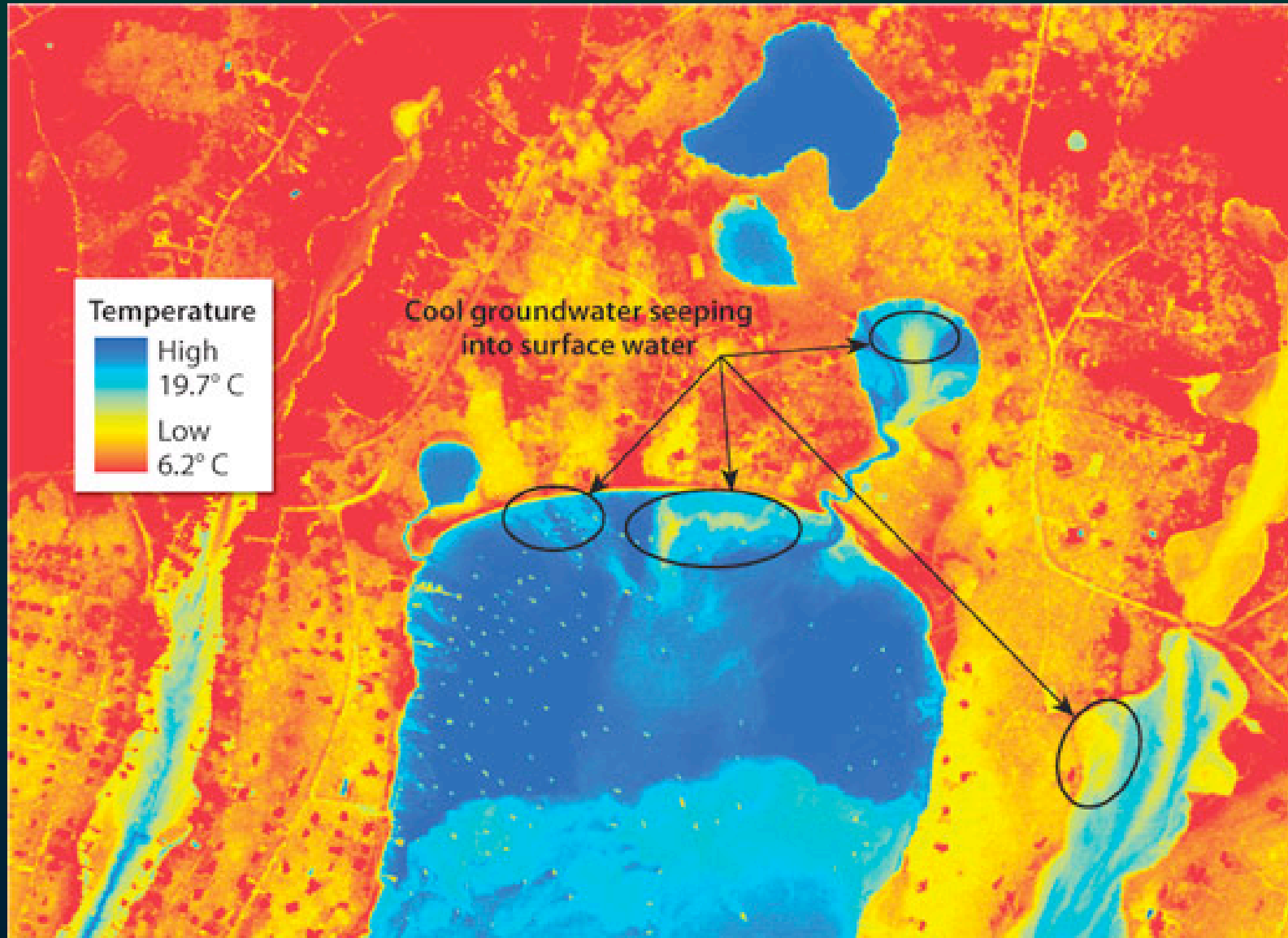


Eel river plume event

SGD and Contaminants

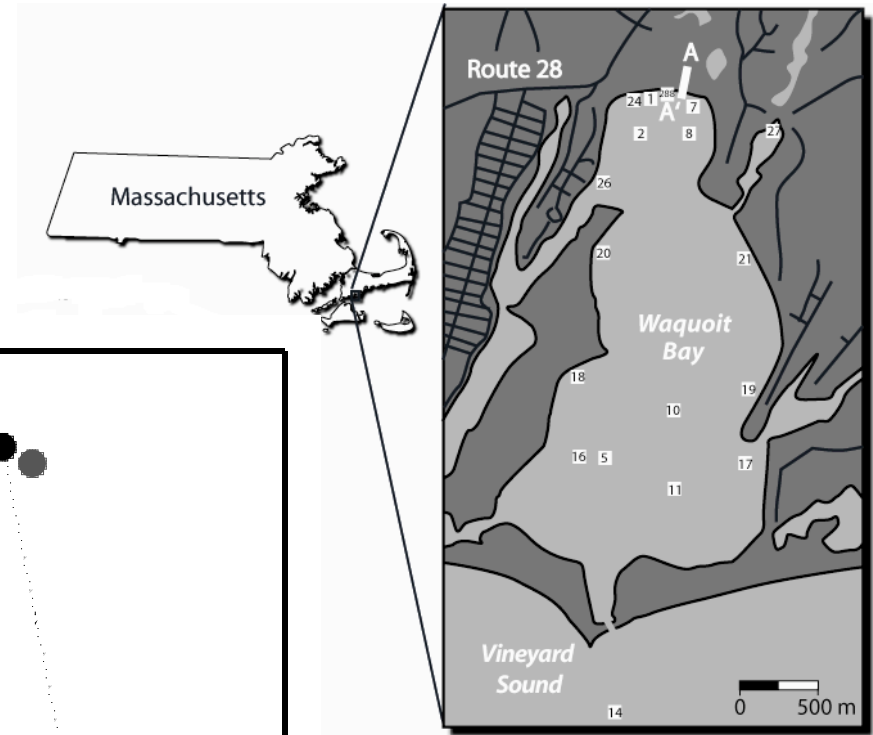
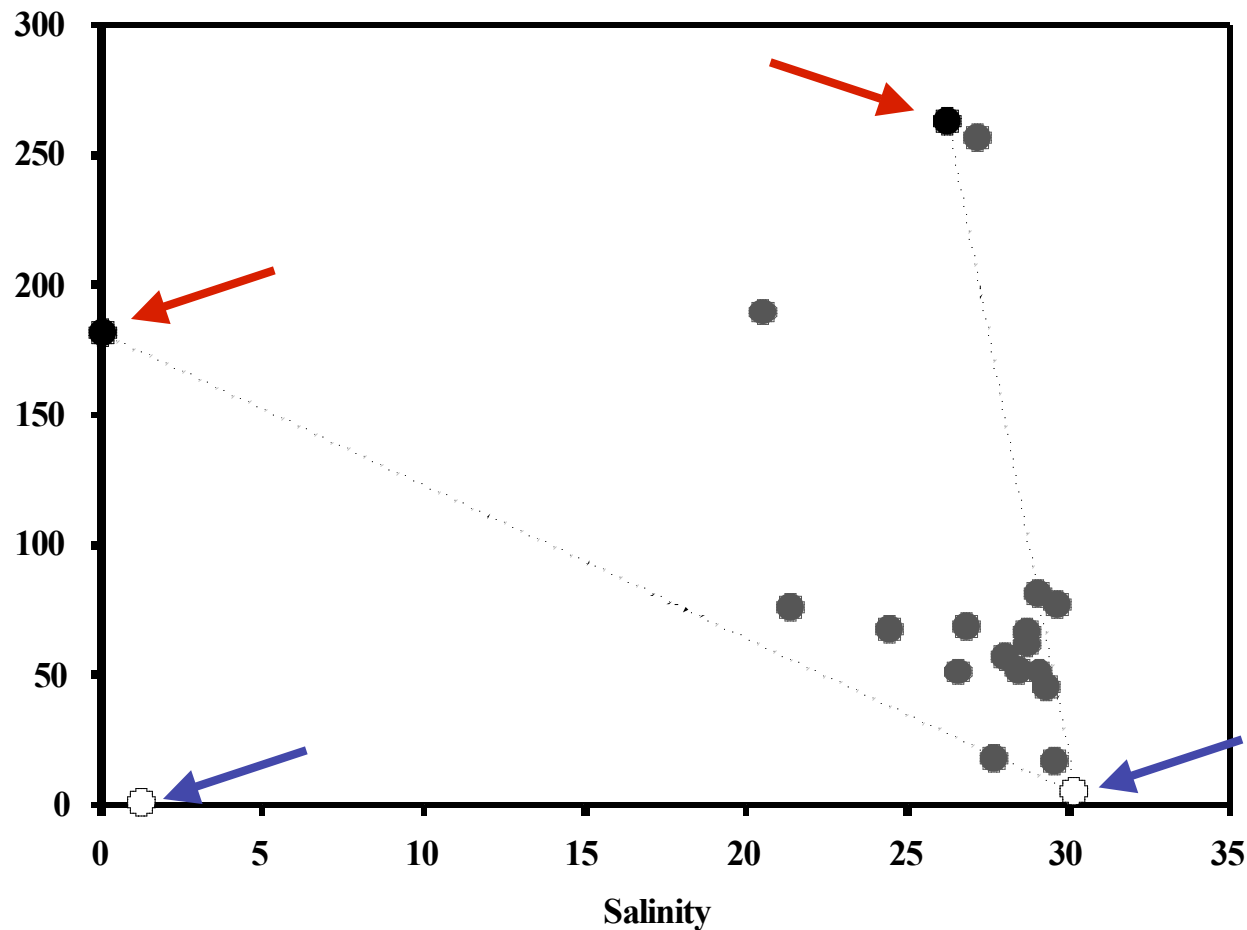


Aerial Thermal Infrared Surveys: Waquoit Bay



New Developments...Hg in Submarine Groundwater Discharge Results in High Hg in Waquoit Bay (work of summer student fellow, Sharon Bone w/ M. Charette and C. Lamborg)

Bay concentrations (gray) very elevated, and look much like the groundwater (black)



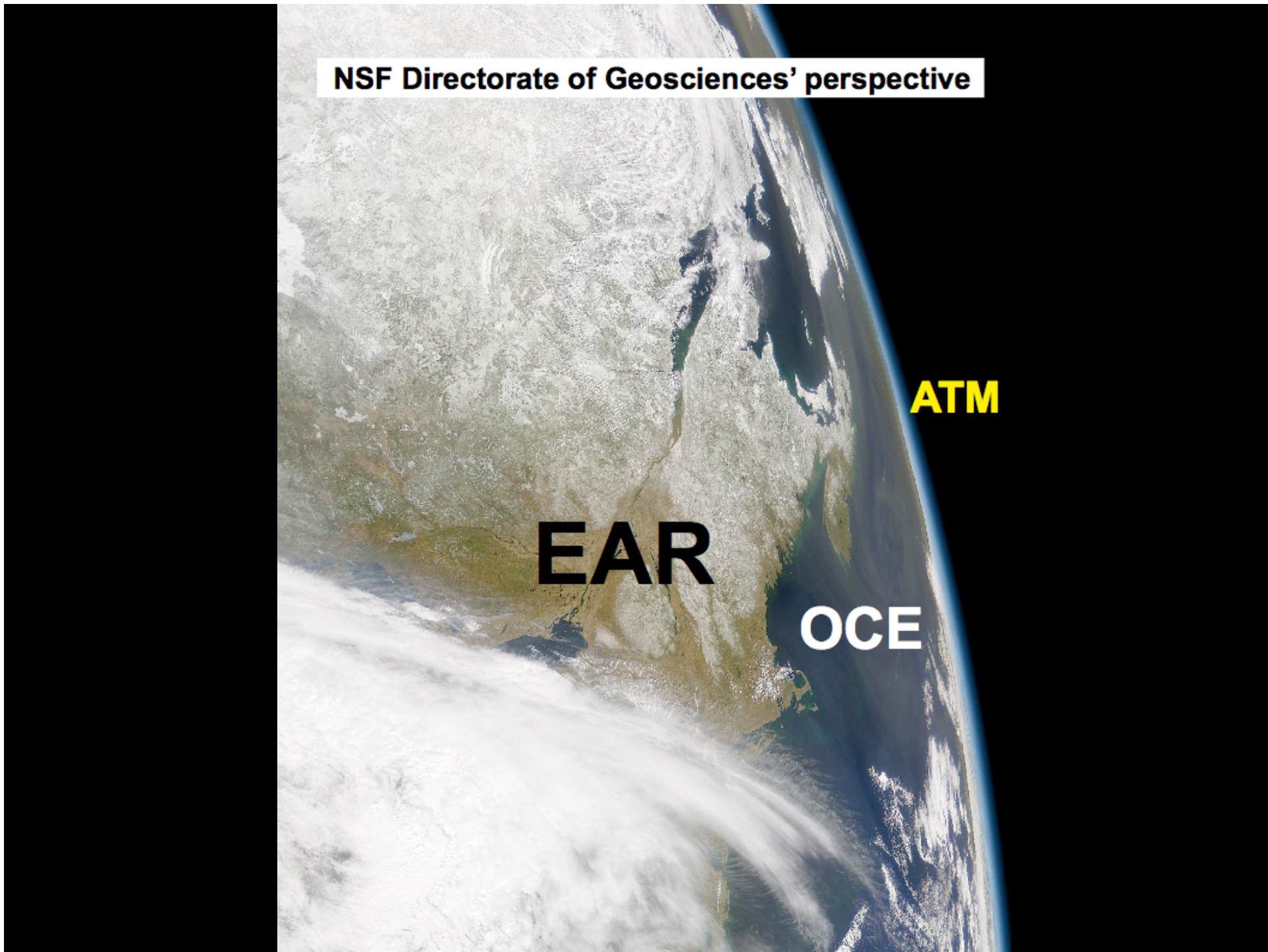
typical seawater concentrations in Vineyard Sound (5 pM) and Childs River (white)

NSF Directorate of Geosciences' perspective

EAR

ATM

OCE



WHOI's Perspective

