Chesapeake Bay National Estuarine Research Reserve

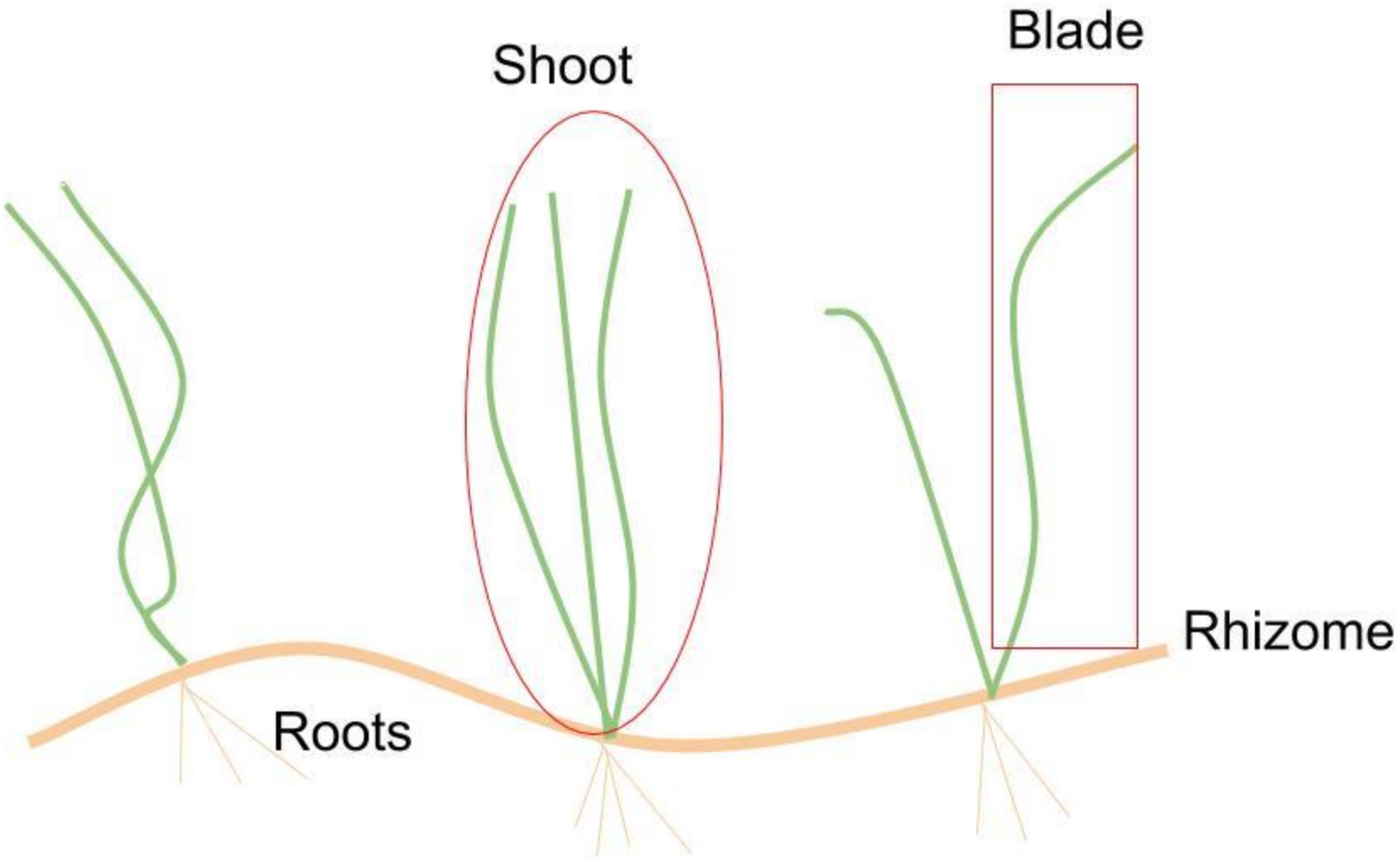
Understanding Changes in Seagrass Communities:

Impacts from Local Environmental Factors

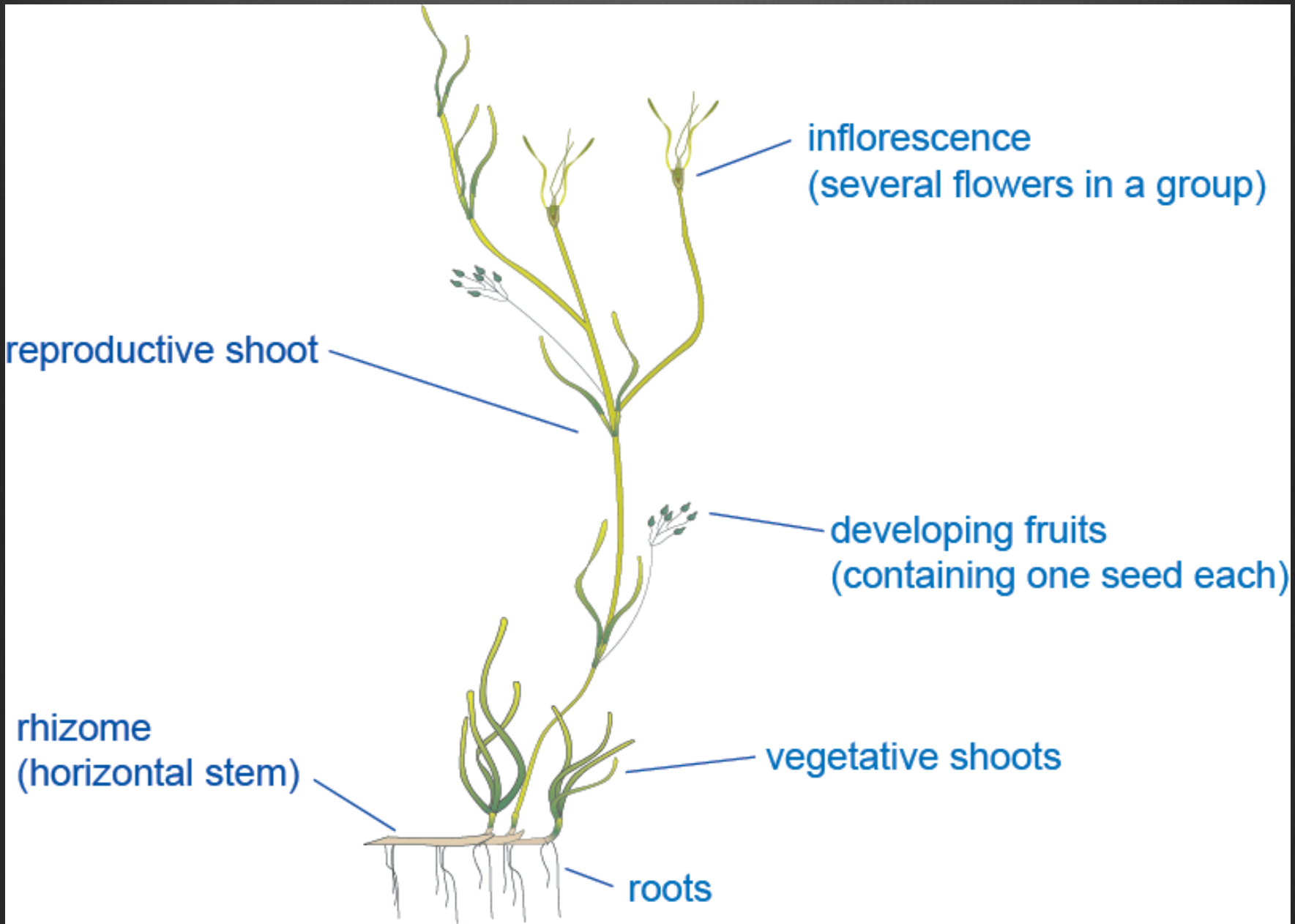
What do we already know about SAV?

Clarification Point: Is seagrass an algae (seaweed)?

Basic Information: Structure



Basic Information: Reproduction



Basic Information: Epiphytes

Ecosystem Services

- Food and shelter for important species
- Sediment stabilization
- Eutrophication mitigation
- Absorbing wave energy
- Carbon sequestration

Current Threats

- High levels of nutrient/sediment run-off
- Elevated Water Temperatures
- Dredging
- Heavy Boat Traffic

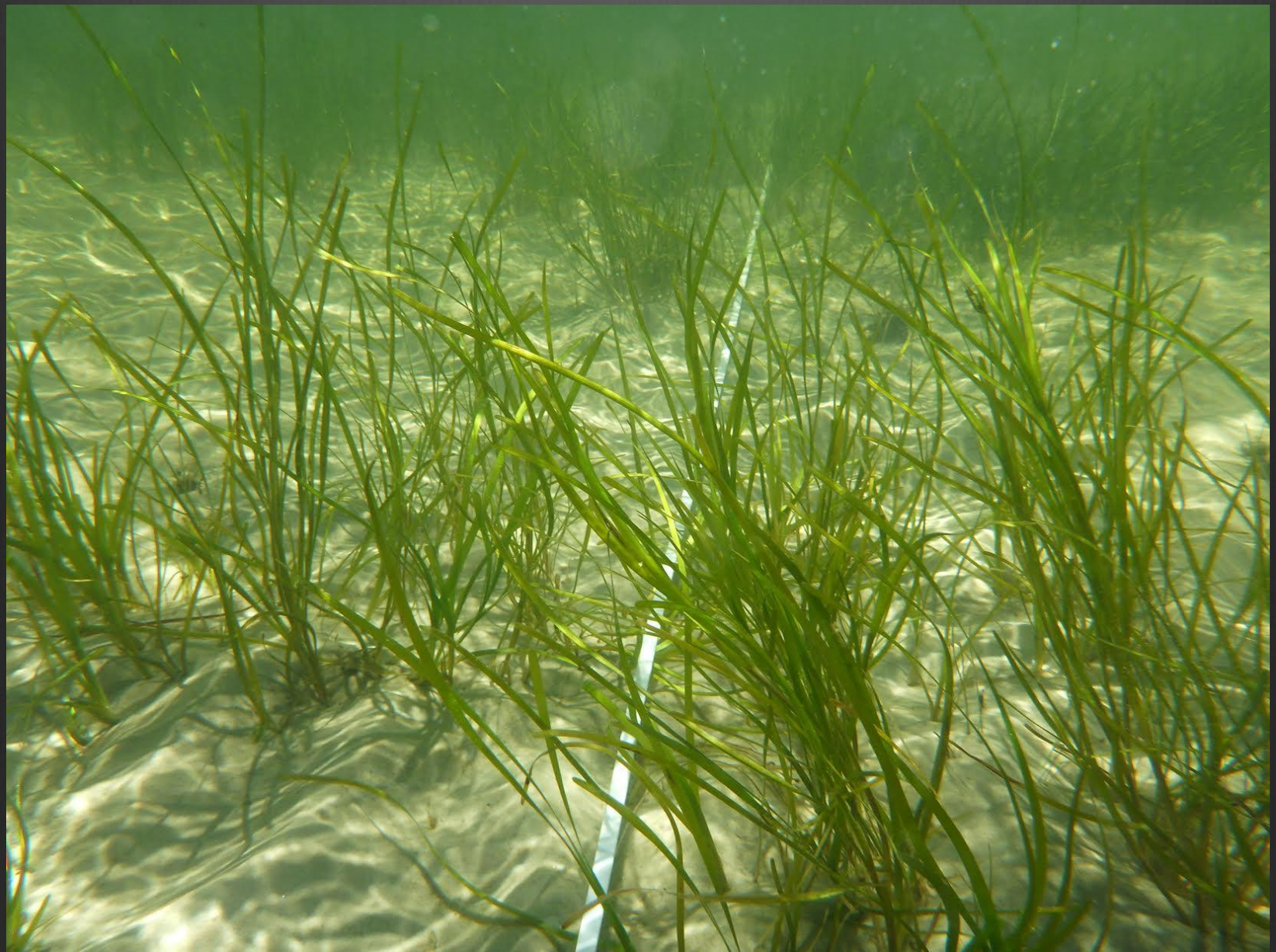
The Main Question

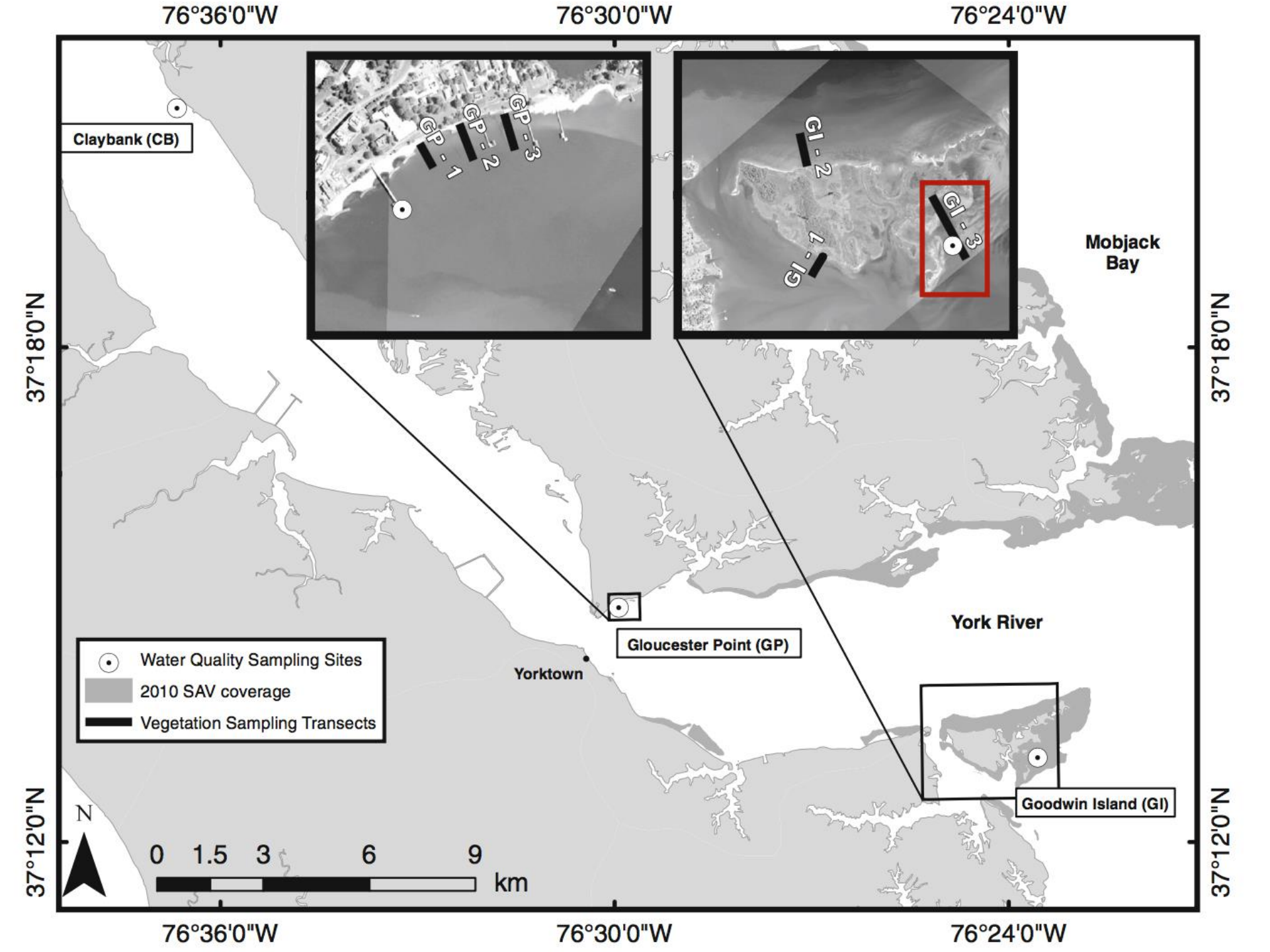
What environmental variables control the distribution of seagrass?

The Actual Methods used by CBNERR scientists


Welcome to Goodwin Island

What is a fixed transect?




76°36'0"W
76°30'0"W
76°24'0"W
37°18'0"N
37°12'0"N
Claybank (CB)
GP - 1
GP - 2
GP - 3
GI - 1
GI - 2
GI - 3
Mobjack Bay
York River
Gloucester Point (GP)
Yorktown
Goodwin Island (GI)
Water Quality Sampling Sites
2010 SAV coverage
Vegetation Sampling Transects
N
0 1.5 3 6 9
km

Erin, our fearless seagrass scientist


MAGNUM
Sport
Gill

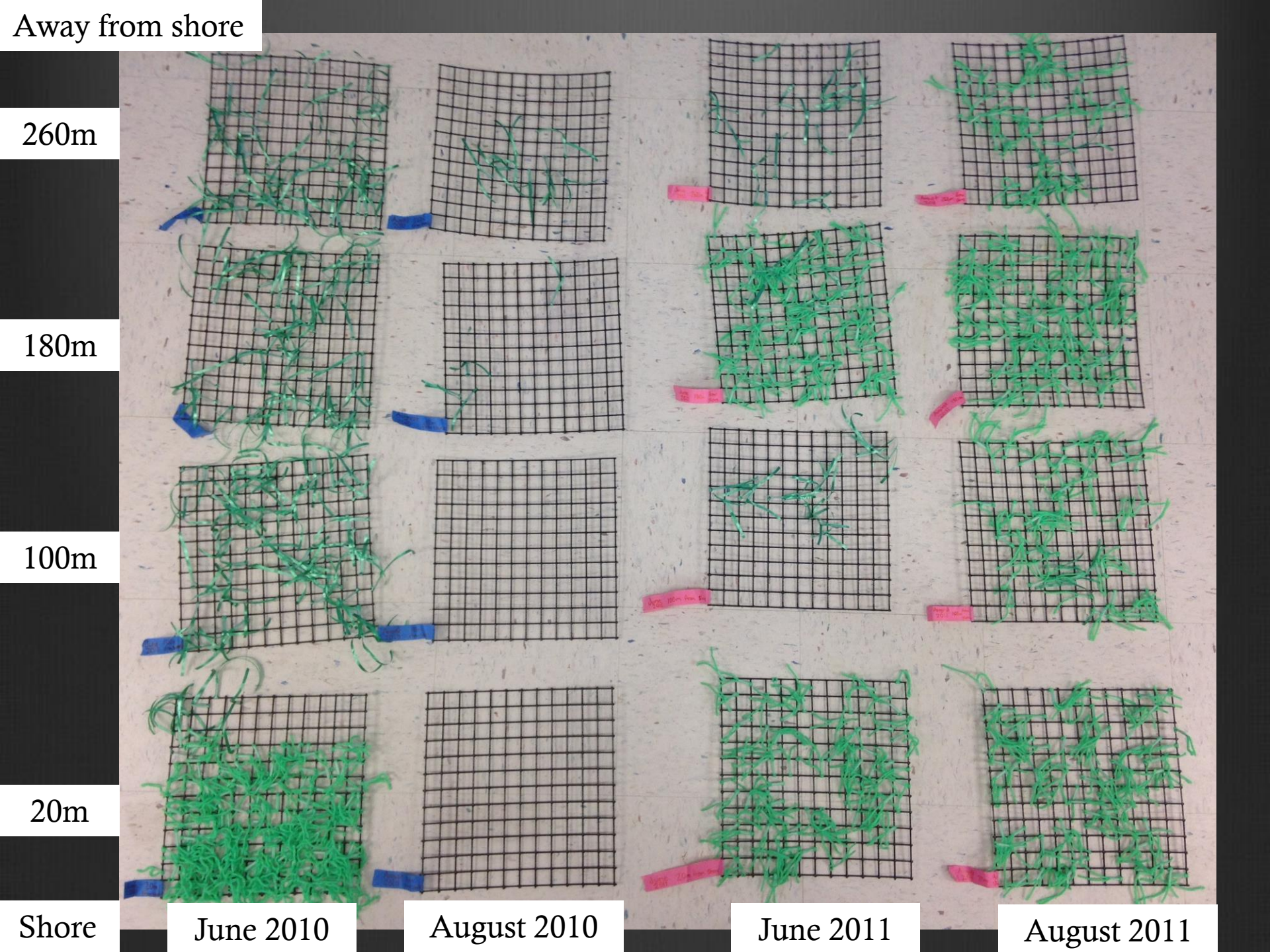
Simulation Method

- Ribbon= Eelgrass (*Zostera marina*)
- Yarn = Widgeon grass (*Ruppia maritima*)


June
2011
180m
from
shore

Simulation Method

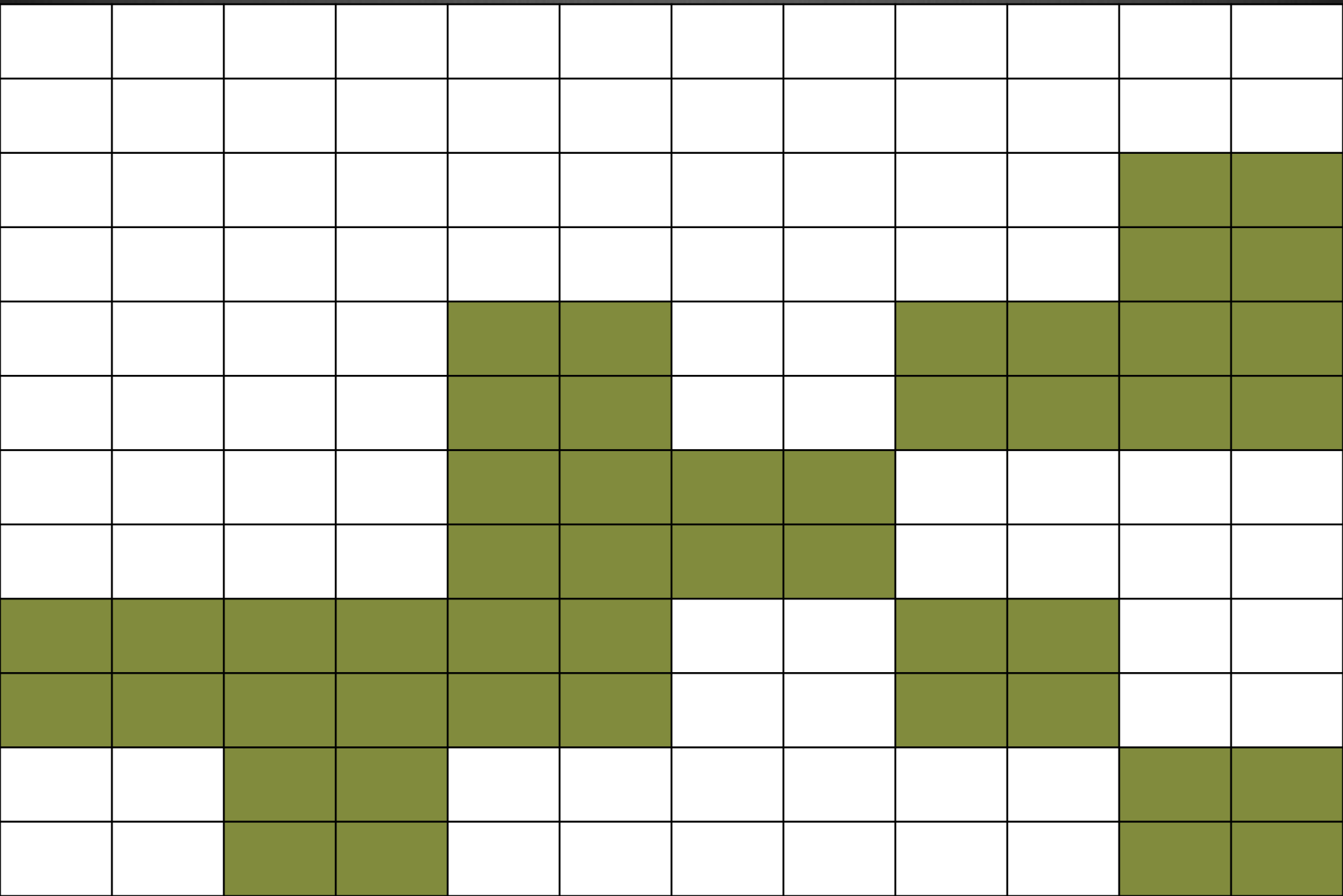
- 1 fixed transect at 4 times
  - June and August of 2010 and 2011
- 4 distances from shore on each
  - 20 m, 100m, 180m, 260m


Away from shore
260m
180m
100m
20m
Shore
June 2010
August 2010
June 2011
August 2011

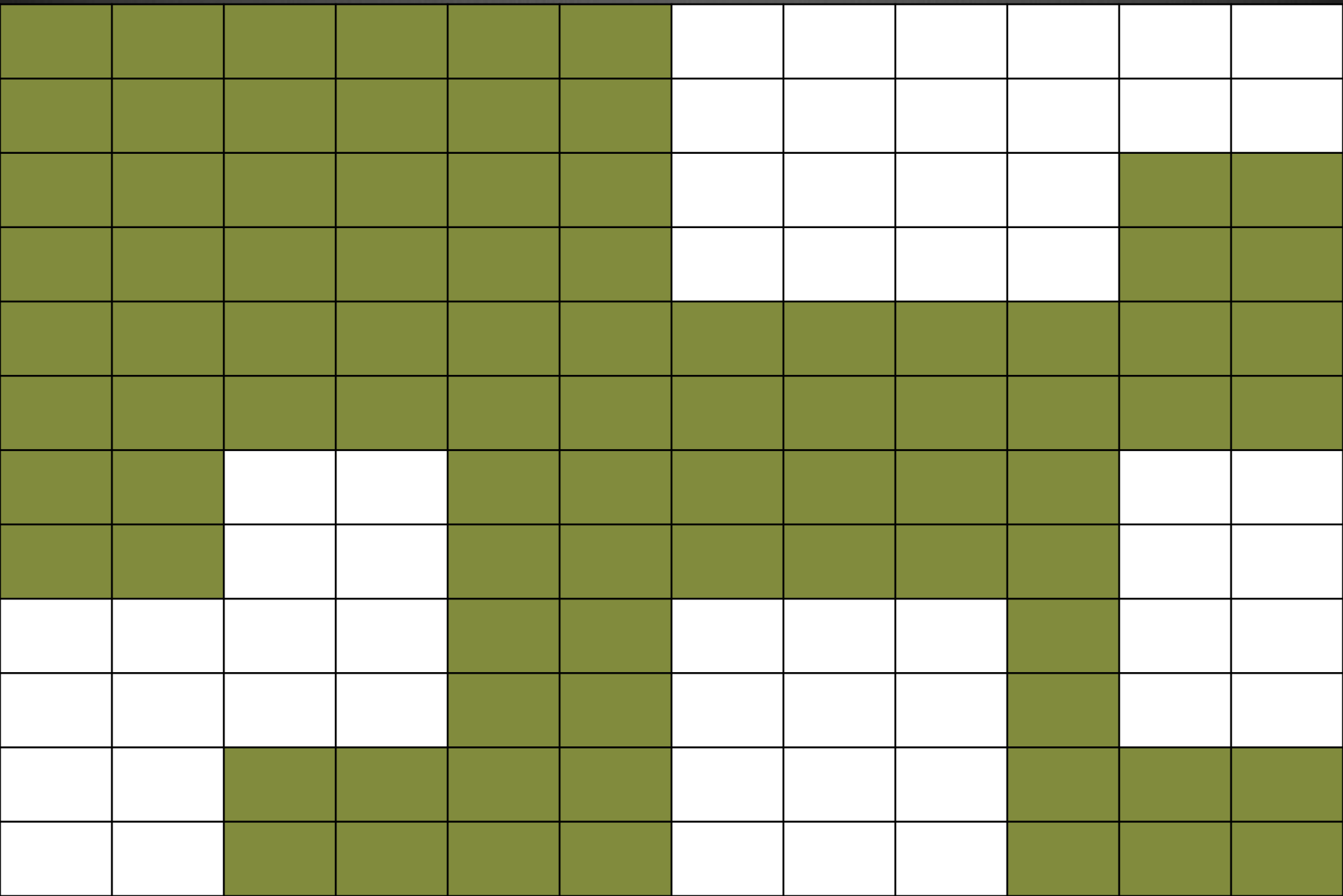
Percent Cover

- Percent cover is usually less than you would guess after a quick glance
- Divide the larger area into smaller areas
- Use the grid square base to your advantage
  - Count square with seagrass and divide by the total number of squares

Practice:



More Practice:




Begin!

Discussion of trends in the data we just collected

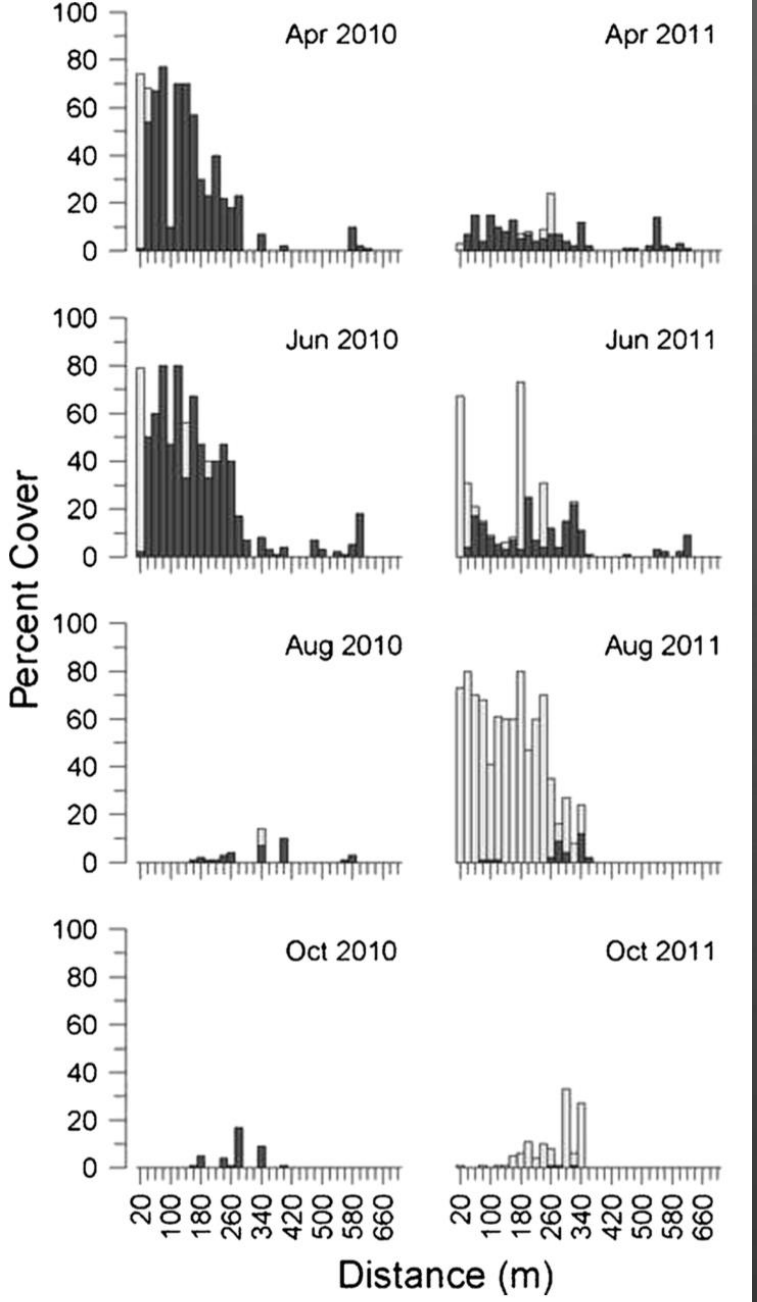
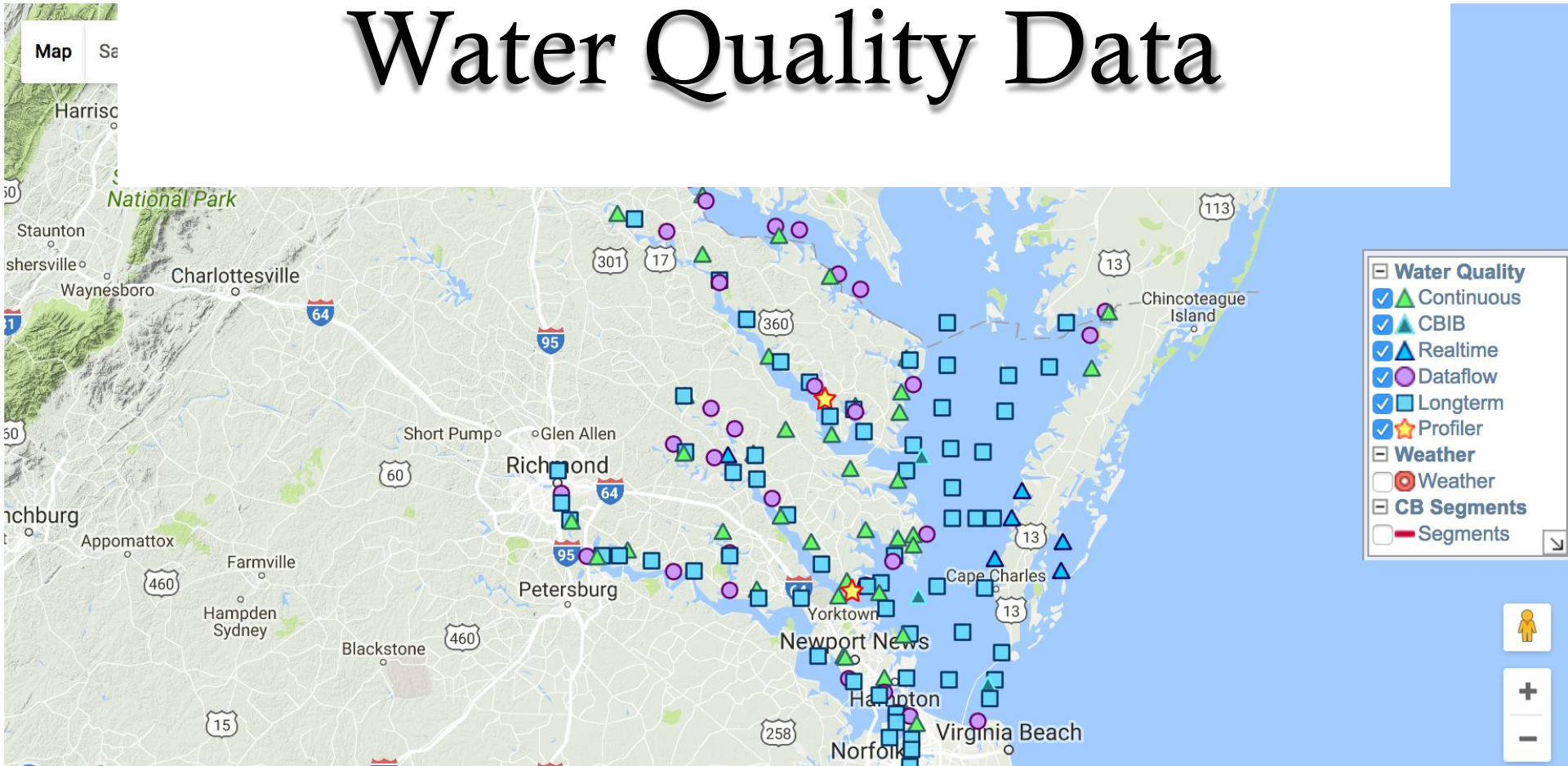


Fig. 4 Vegetative cover of *Z. marina* (*black bars*) and *R. maritima* (*gray bars*) at every distance sampled along the GI-3 transect; 2010 (*left panel*) and 2011 (*right panel*) are represented. The months included are April (**a**, **b**), June (**c**, **d**), August (**e**, **f**), and October (**g**, **h**)

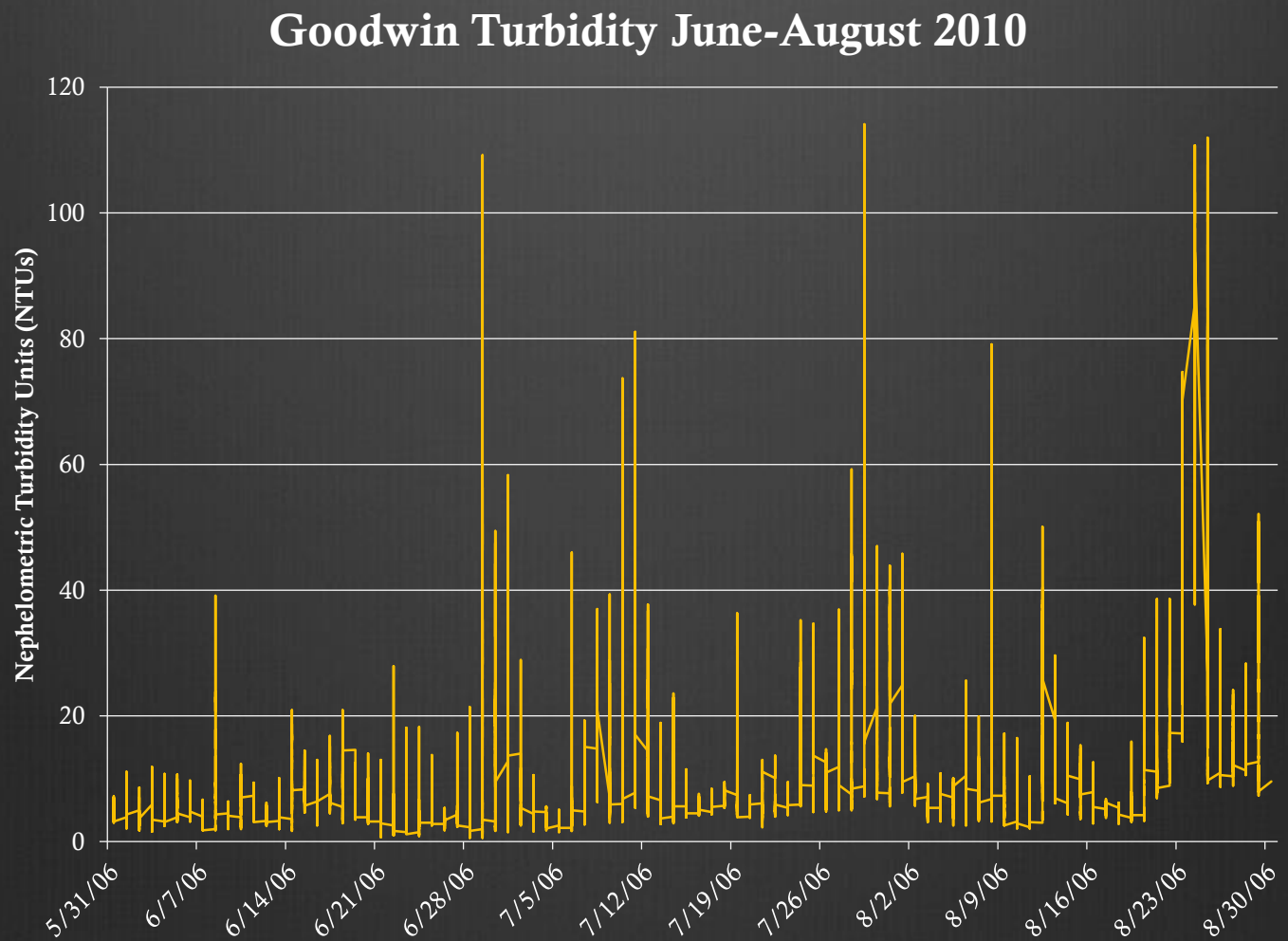
Figure from Moore et al., 2014

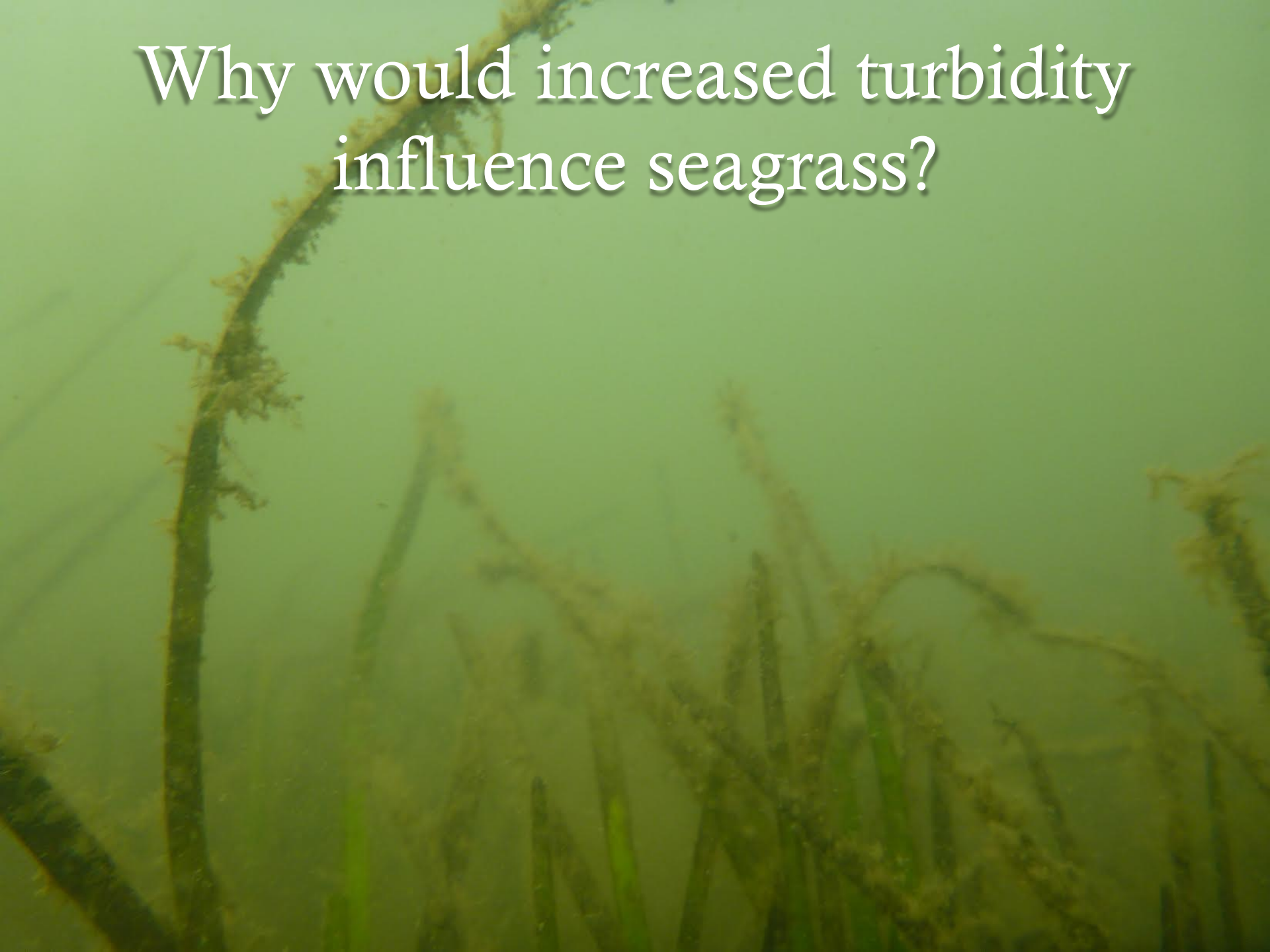
WILLIAM & MARY | Virginia Institute of Marine Science VECOS

Water Quality Data

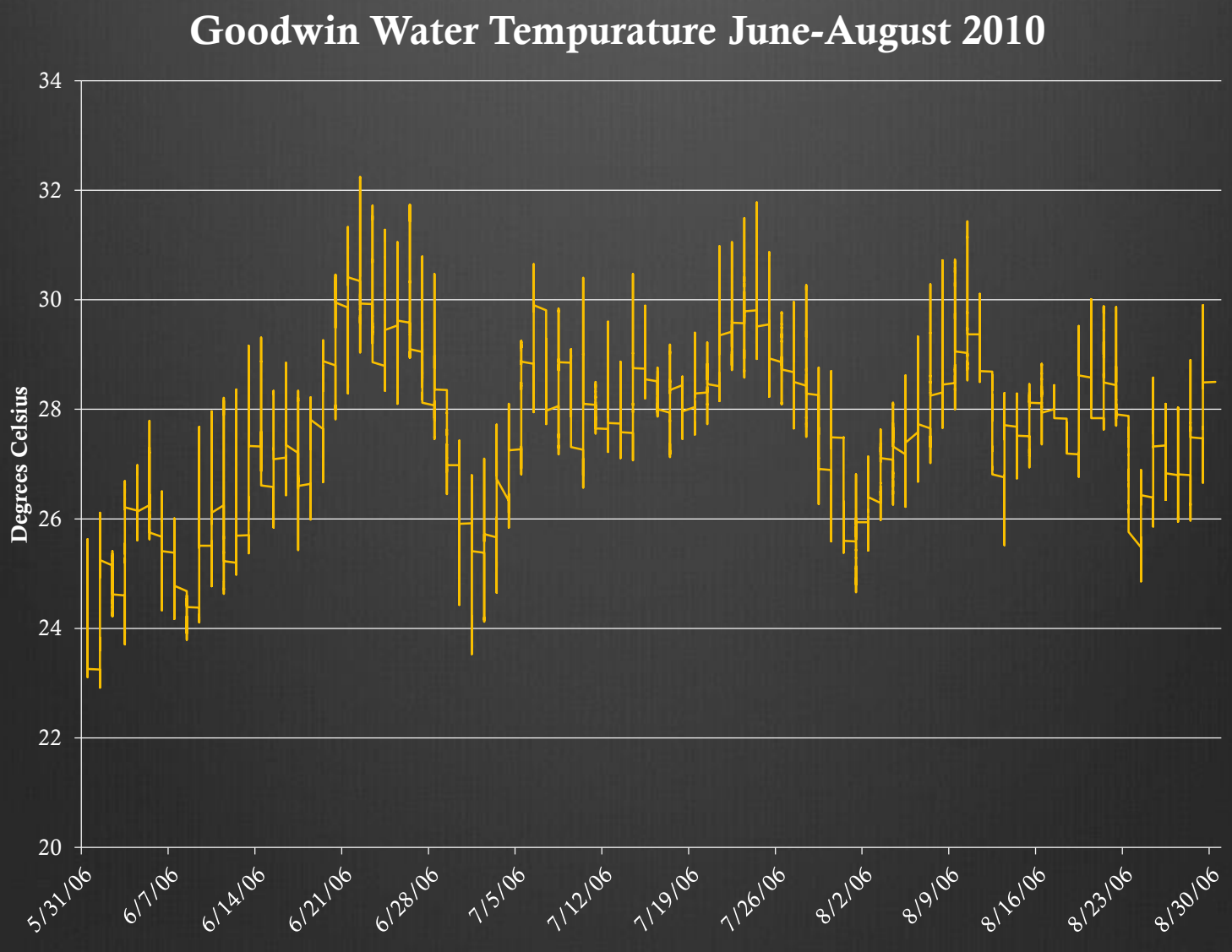


Turbidity trends do not explain observed seagrass community change




Why would increased turbidity influence seagrass?

The key: Hot temperatures in June 2010



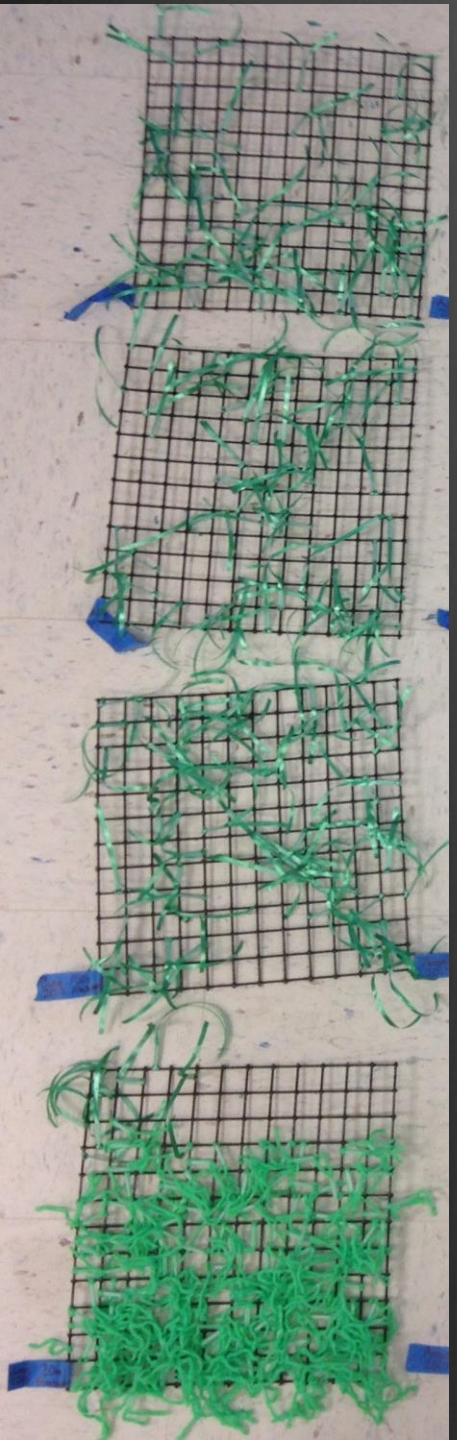
Why would changes in temperature influence seagrass?

Temperature

Respiration

Light Requirement

Discussion



If widgeon grass was blocked from growing in the near shore waters, do you think eelgrass could grow there?

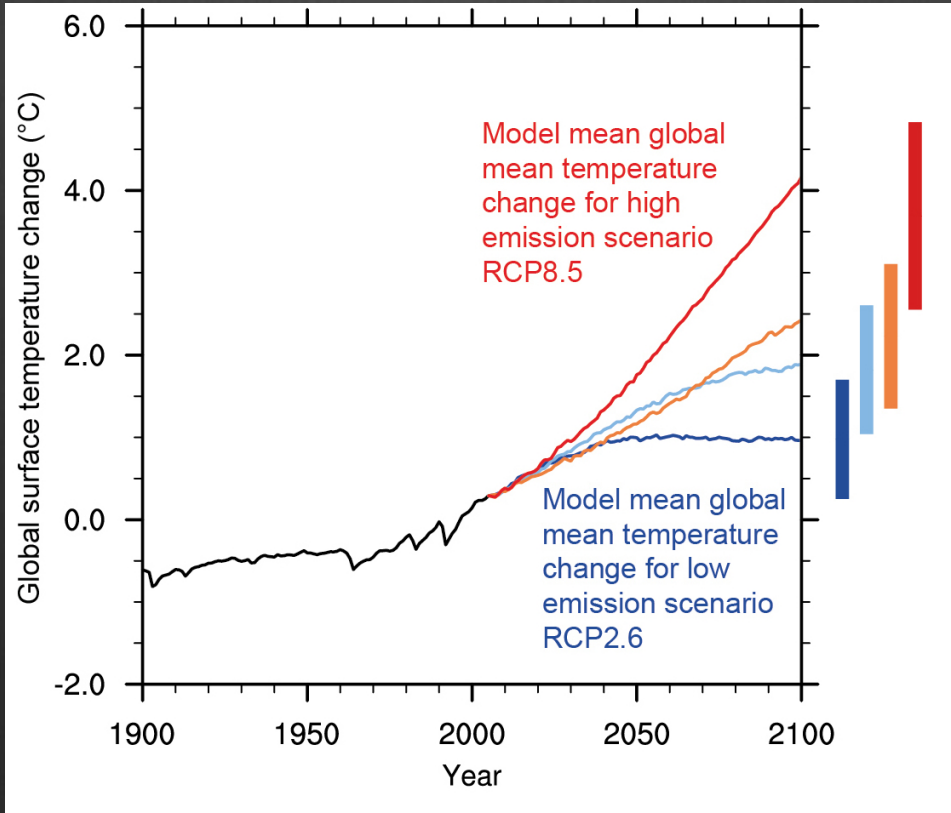
Why was widgeon grass able to colonize the substrate where eelgrass had died-off?

Within its Chesapeake Bay range, do you think eelgrass has been disappearing equally from all regions or more in its upriver sections or more in its downriver sections?

Do you think based on the physical shape of the seagrasses that one might be more valuable as a habitat?

The Bigger Picture: Climate Change

- Temperatures are predicted to rise further
- Loss of eelgrass in the Chesapeake Bay




Any questions?