

The background of the slide is a photograph of a seagrass bed in shallow water. The water is a light, clear blue-green color. The seagrass blades are long, thin, and green, with some showing a slight yellowish tint. They are densely packed and appear to be swaying gently. The overall scene is a natural, underwater environment.

High Resolution Profiler Measurements of Shear Flow within Seagrass Beds of Coastal Virginia

Jennifer Romanowich

University of Virginia Department of Environmental
Sciences

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Seagrass Ecosystem:

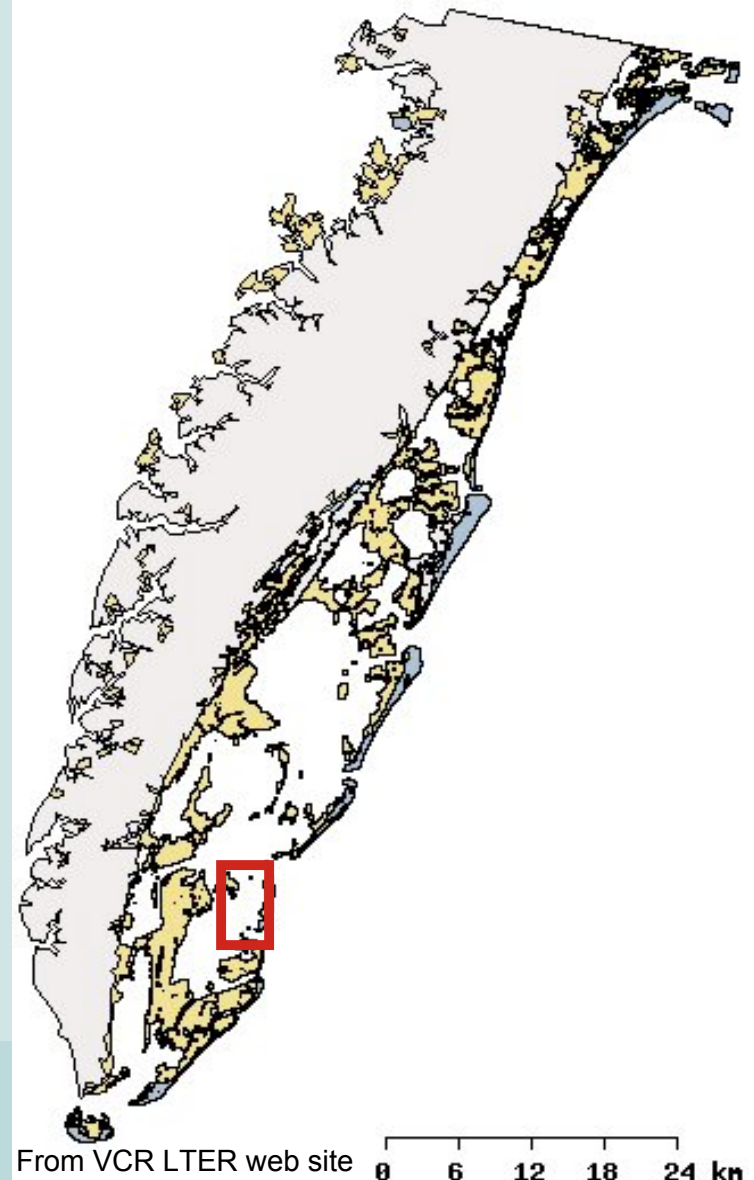
- Highly productive systems
- In danger due to disease and eutrophication
- Rely on light and local nutrient availability
- Provide structure

Questions:

- How does topographic structure of the benthos alter flow structure seagrass beds?
- Does the topographic variability of the benthic community control local suspended sediment concentration?

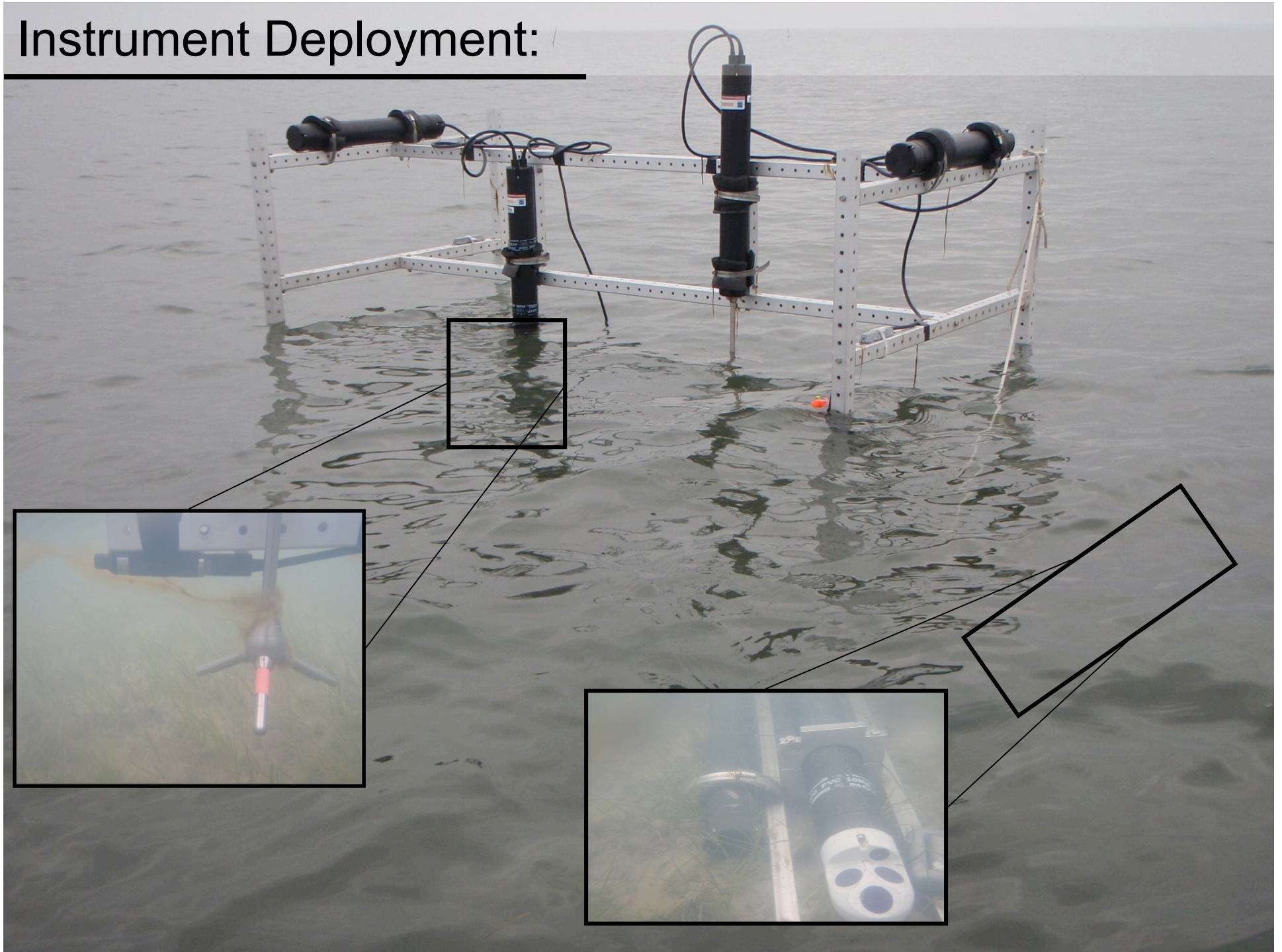
Site Description:

- Virginia Lagoon and Estuary Systems:
 - Shallow water; 2 m
 - With and without seagrass species *Zostera marina*
- Seagrass:
 - Blades average 30 cm in summer, max 50 cm
 - Flexible canopy
 - Density 400 shoots/m²



From VCR LTER web site 0 6 12 18 24 km

Instrument Deployment:



Data Analysis:

- Output Vector:

- Tides

- Velocity:

$$U = \sqrt{u^2 + v^2}$$

- Reynolds Stress:

$$\overline{u'w'}$$

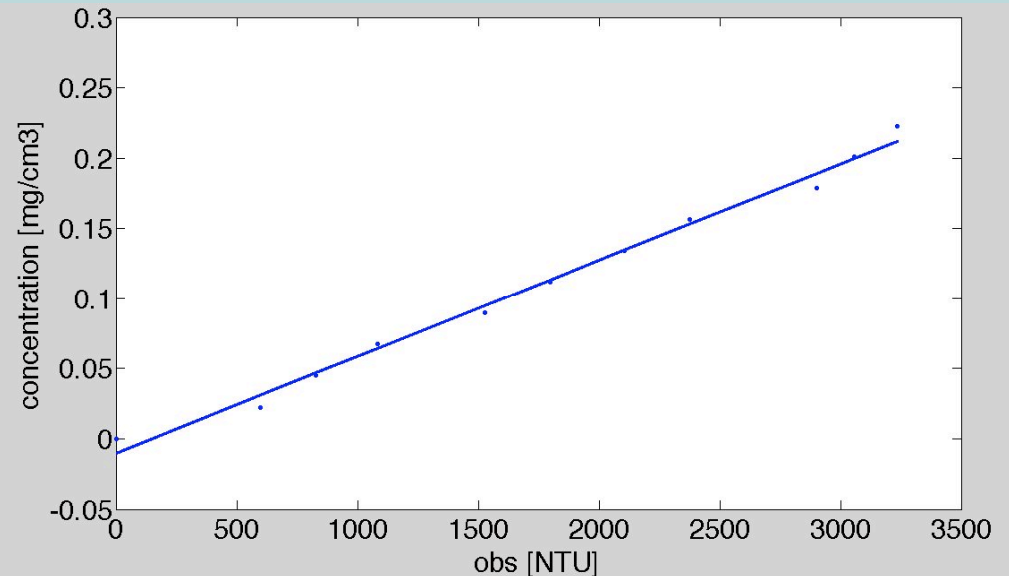
- Output OBS:

- Sediment concentration

- Output Aquadopp:

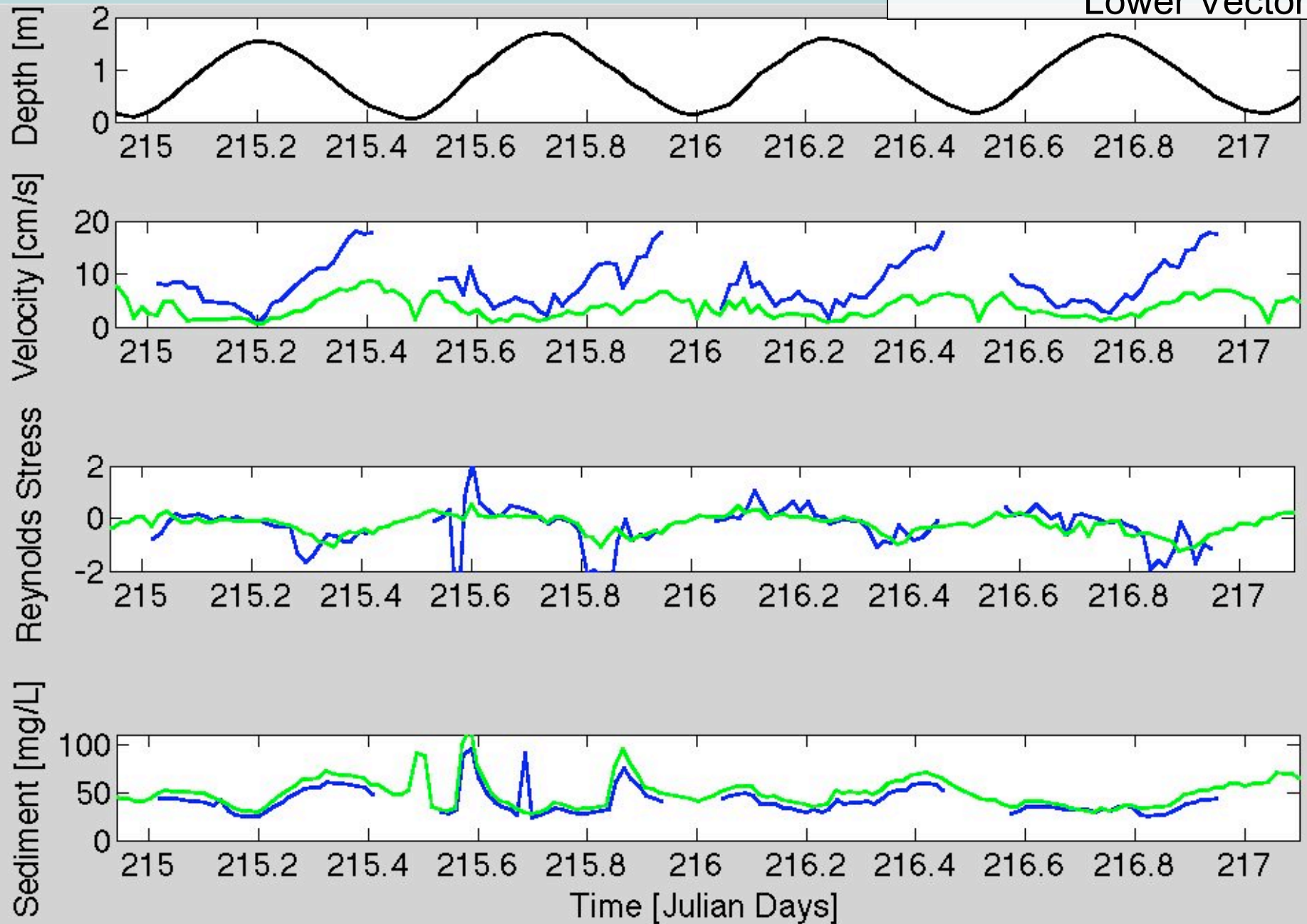
- Velocity variation with depth and time

- Vertical velocity profiles



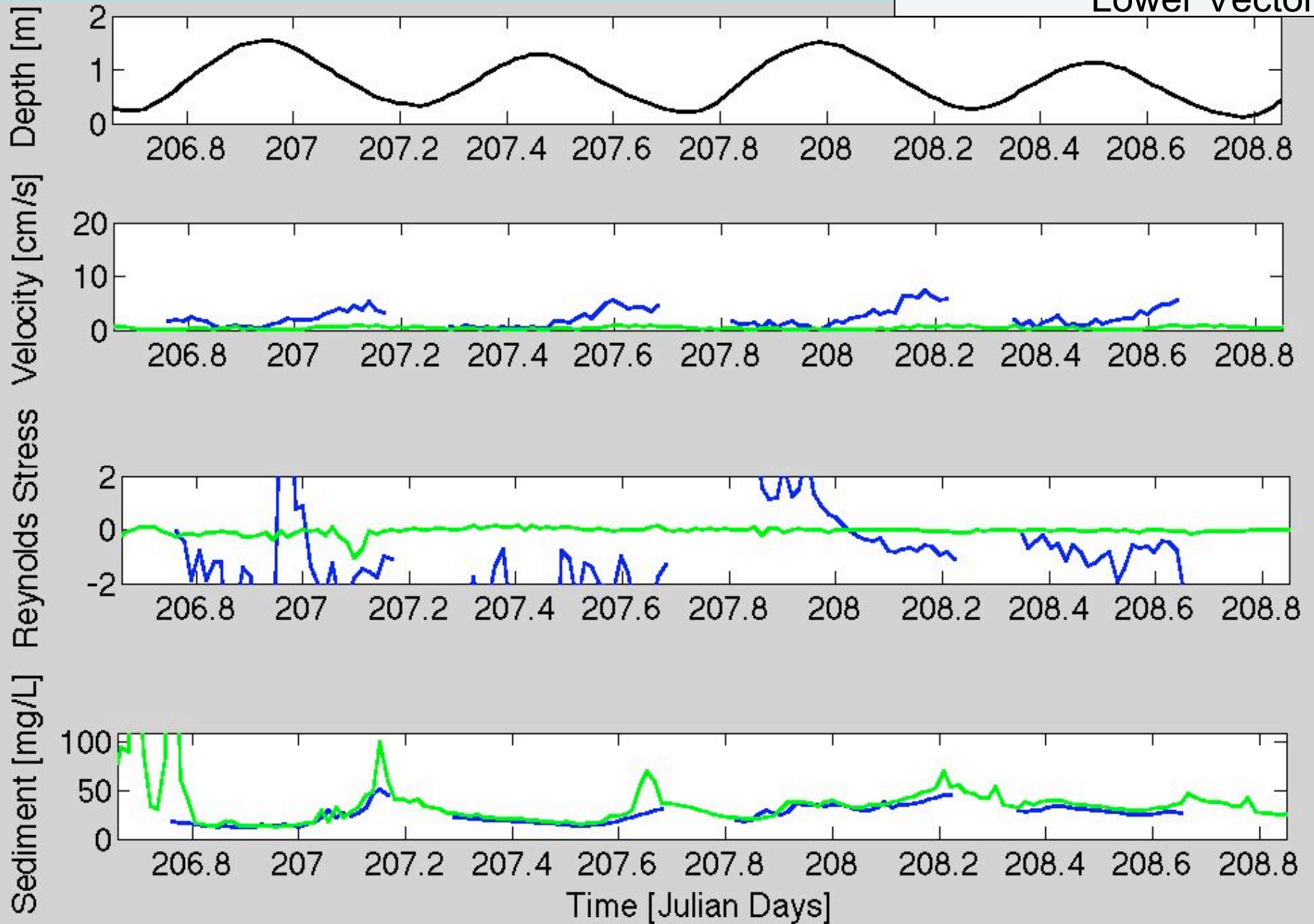
Results Bare:

— Upper Vector
— Lower Vector

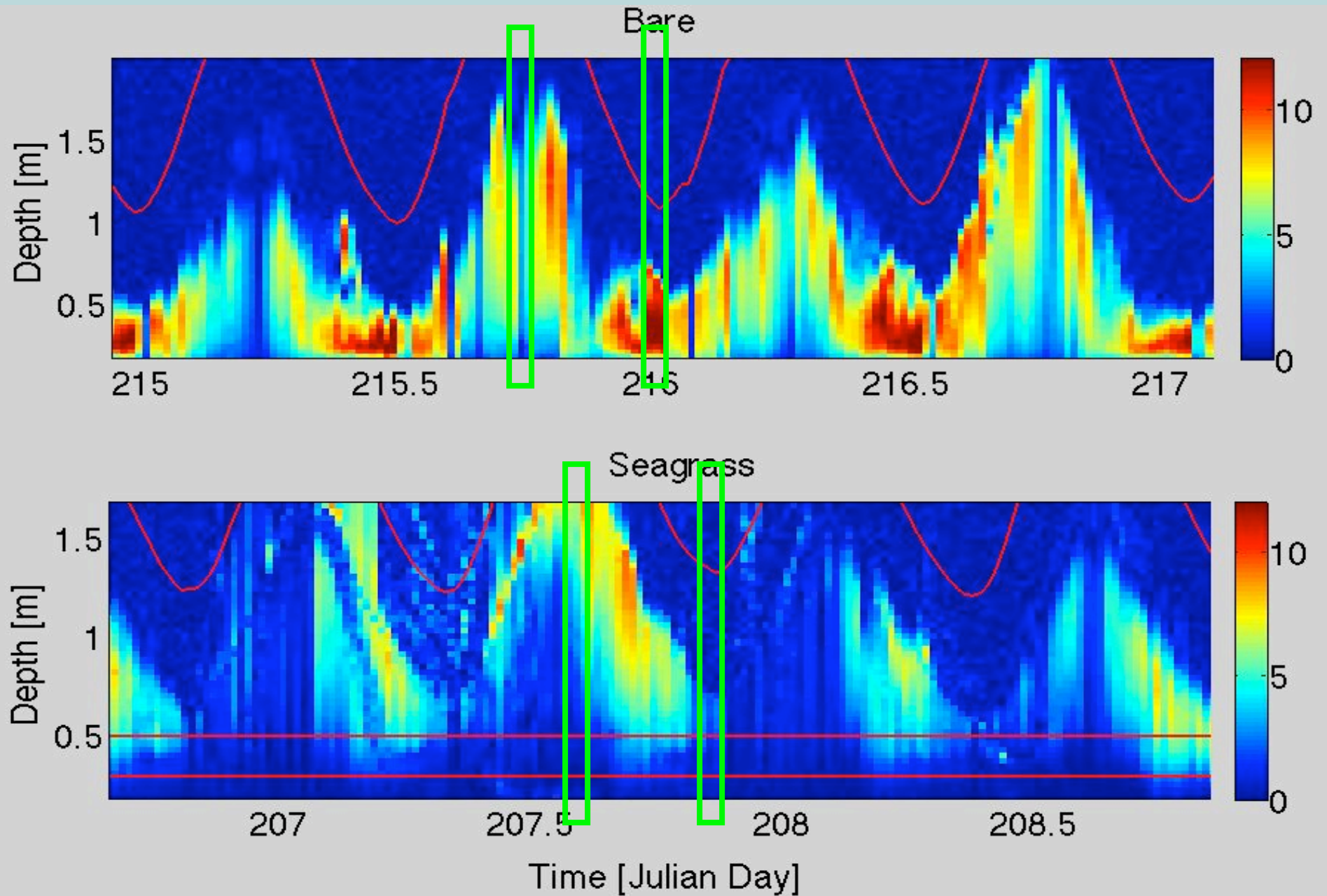


Results Seagrass:

Upper Vector
Lower Vector



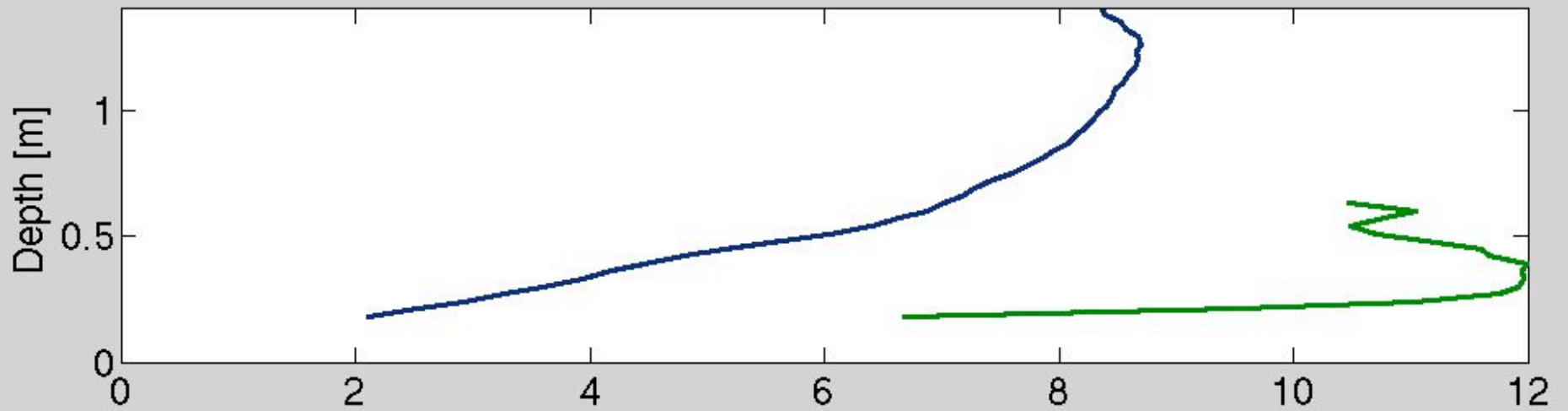
Results Profiler:



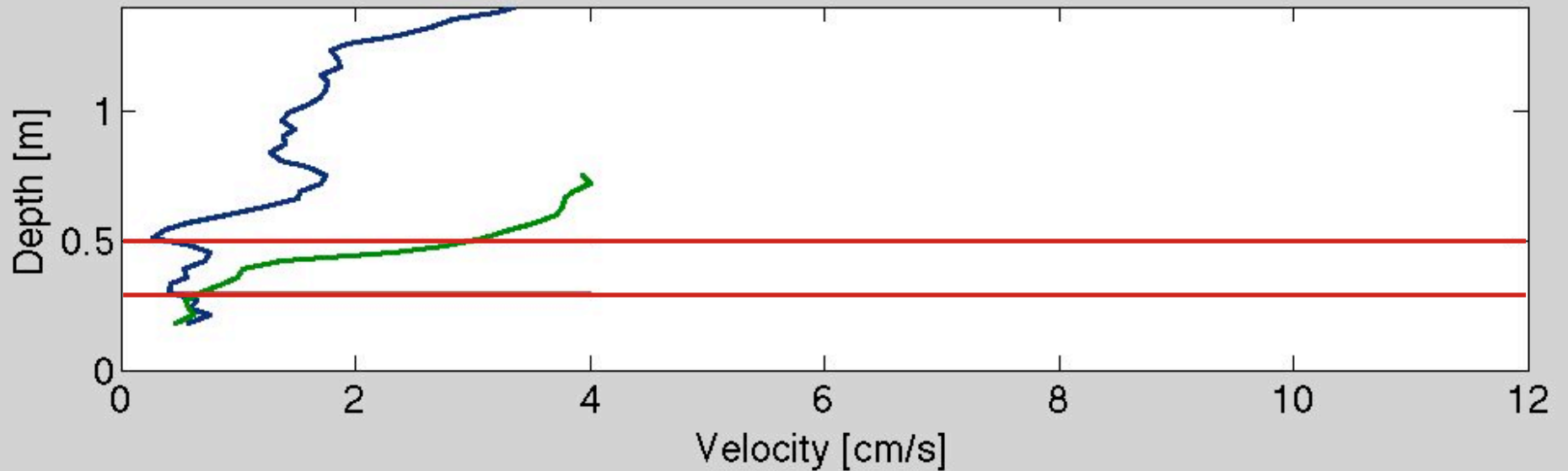
Results Profiles:

— High Tide
— Low Tide

Bare



Seagrass



Summary:

- Seagrass decrease flow velocities and lower suspended sediment concentrations
- Flow structure is altered in the presence of seagrass
- Higher velocities penetrate meadow at low tide
- Suspended sediment concentrations greater near bed and at low tide

Future Plans:

- Incorporate wave processing
- Sediment flux calculations
- Fluid retention times

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