

HYDROACOUSTIC MONITORING OF SUBMERGED AQUATIC VEGETATION IN THE DELAWARE ESTUARY

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OVERVIEW

- SAV in the Delaware Estuary
- Project Scope
- Methodology
- Initial Results
- Preliminary Discussions
- Next Steps

SAV IN THE DELAWARE ESTUARY

- Submerged Aquatic Vegetation (SAV) are grasses that grow to the surface of the water, but do not emerge
- They provide essential habitat for fish and other wildlife
- SAV benefits include:
 - Habitat/nursery protection
 - Increased DO/nutrient removal
 - Stabilize Sediment
 - Wave attenuation



PROJECT SCOPE



- Fill data gap of distribution and density of submerged aquatic vegetation in the Delaware Estuary
- Develop a baseline inventory of SAV in the Delaware Estuary
- Use this information to make better informed regulatory and management decisions
- Compare distribution and density of SAV to sediment characteristics, mussel habitat, salinity, & water quality

METHODOLOGY

- Hydroacoustic SAV monitoring
 - BioSonics MX Habitat Echosounder
 - BioSonics Visual Acquisition Software for post-processing
 - BioSonics Visual Habitat Software for data analysis
- Underwater Camera and Dive Team
 - Selected Ground Truthing/Survey of Benthics

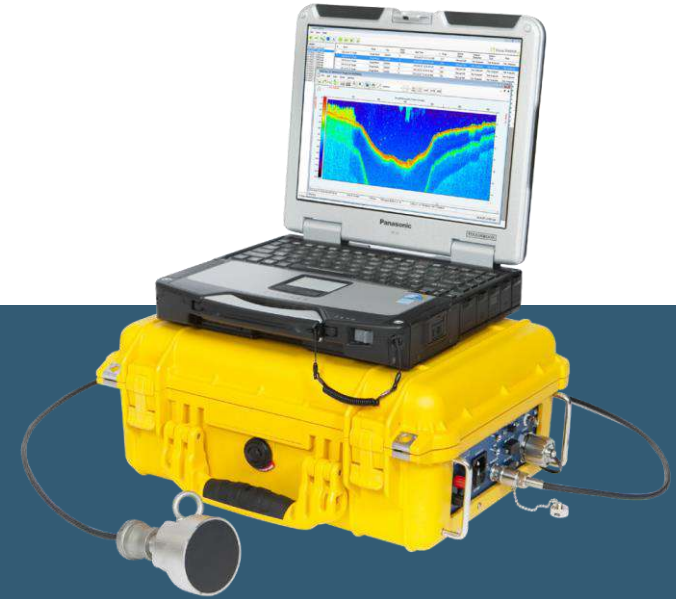


Image taken from <http://www.biosonicsinc.com/products/mx-aquatic-habitat-echosounder/>



METHODOLOGY: WHY HYDROACOUSTICS?

- Neighboring bays use aerial images
- Natural turbidity of Delaware Estuary
 - Extensive review of literature and other data determined that aerial images are not viable



Check out this
water clarity!

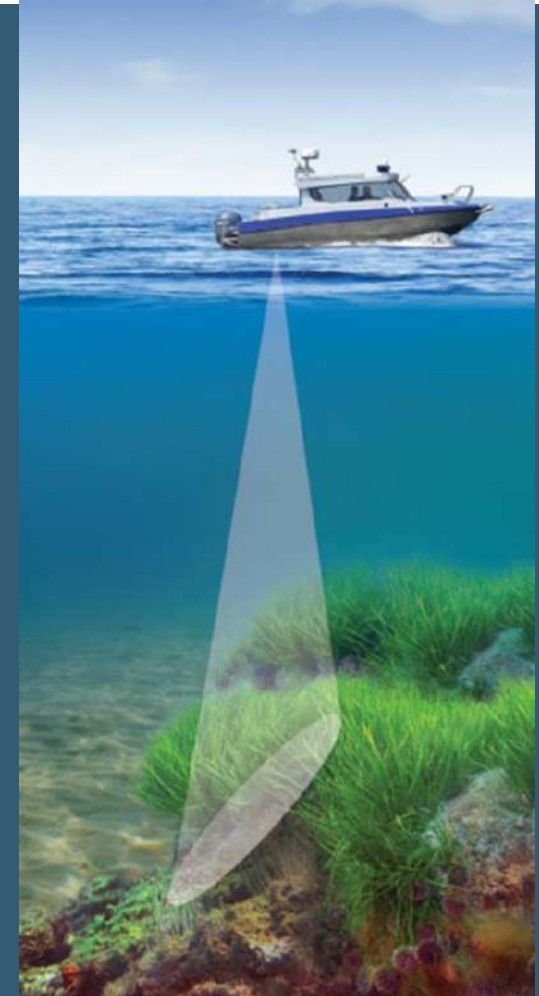
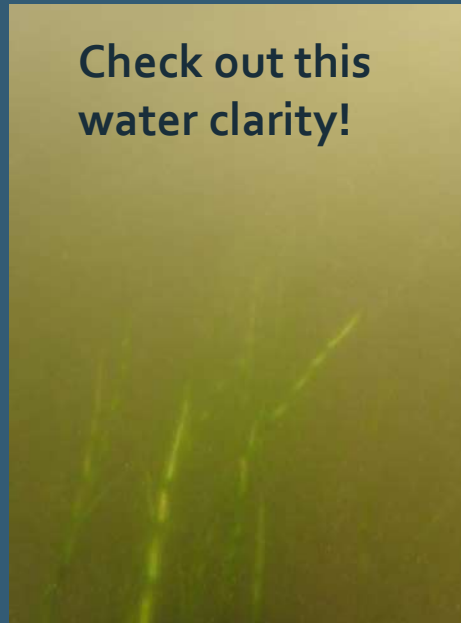


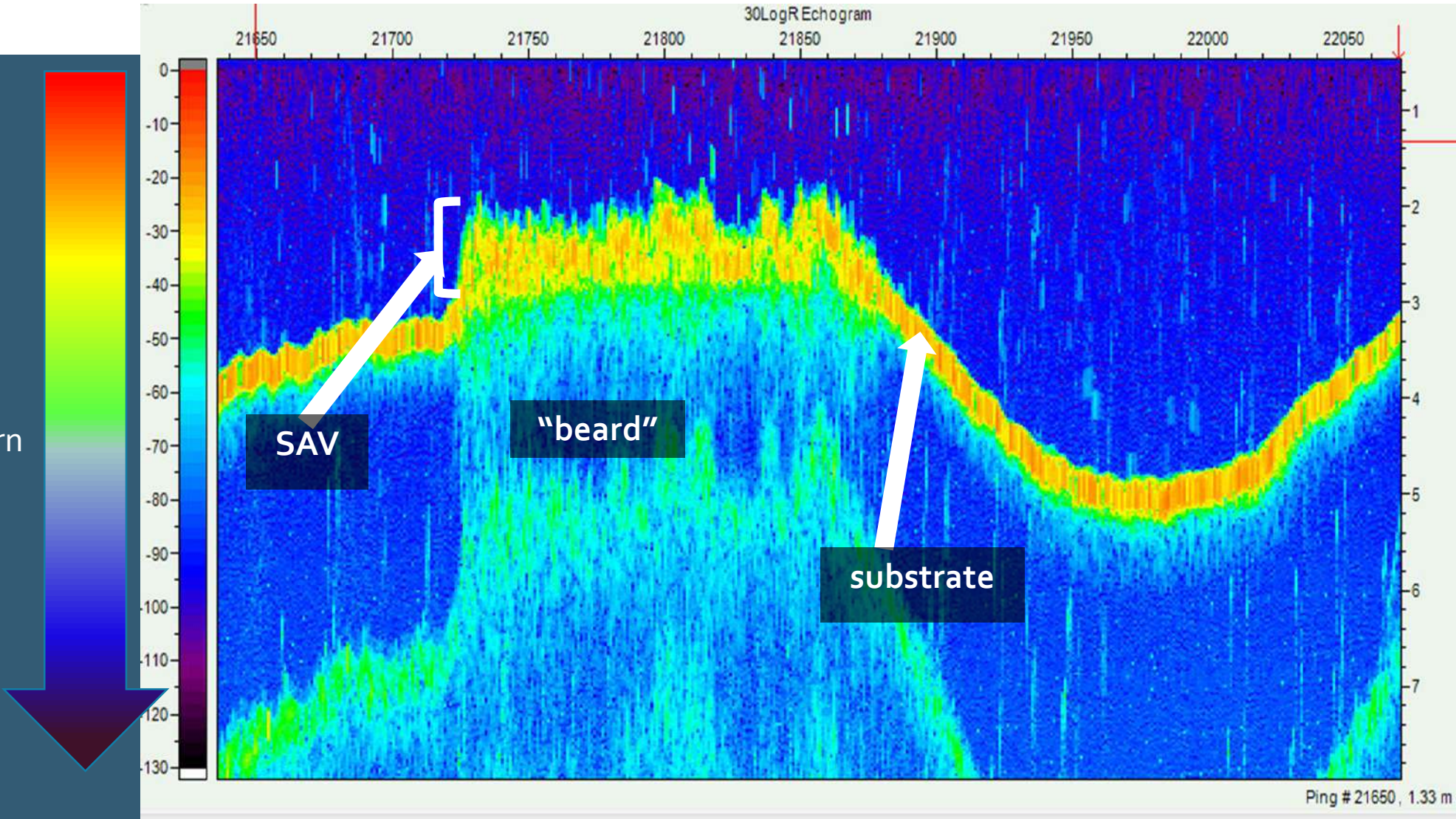
Image taken from
<http://www.biosonicsinc.com/products/mx>

GETTING 'SAV'VY

Amplitude (dB)
Red: strong return echo

Green: SAV signature return

Blue: weak return echo

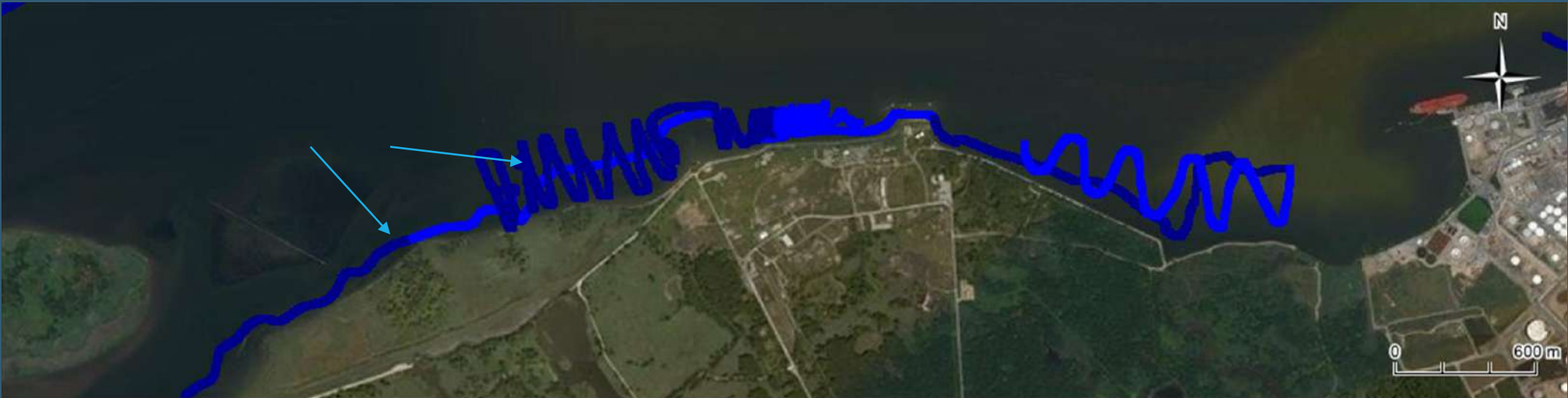


METHODOLOGY CONT.

- Parallel transect to shore at 10ft MHHW to determine presence/absence
- Perpendicular transects where SAV is present
 - Delineate SAV bed
- Divers ground truthed transects of SAV beds

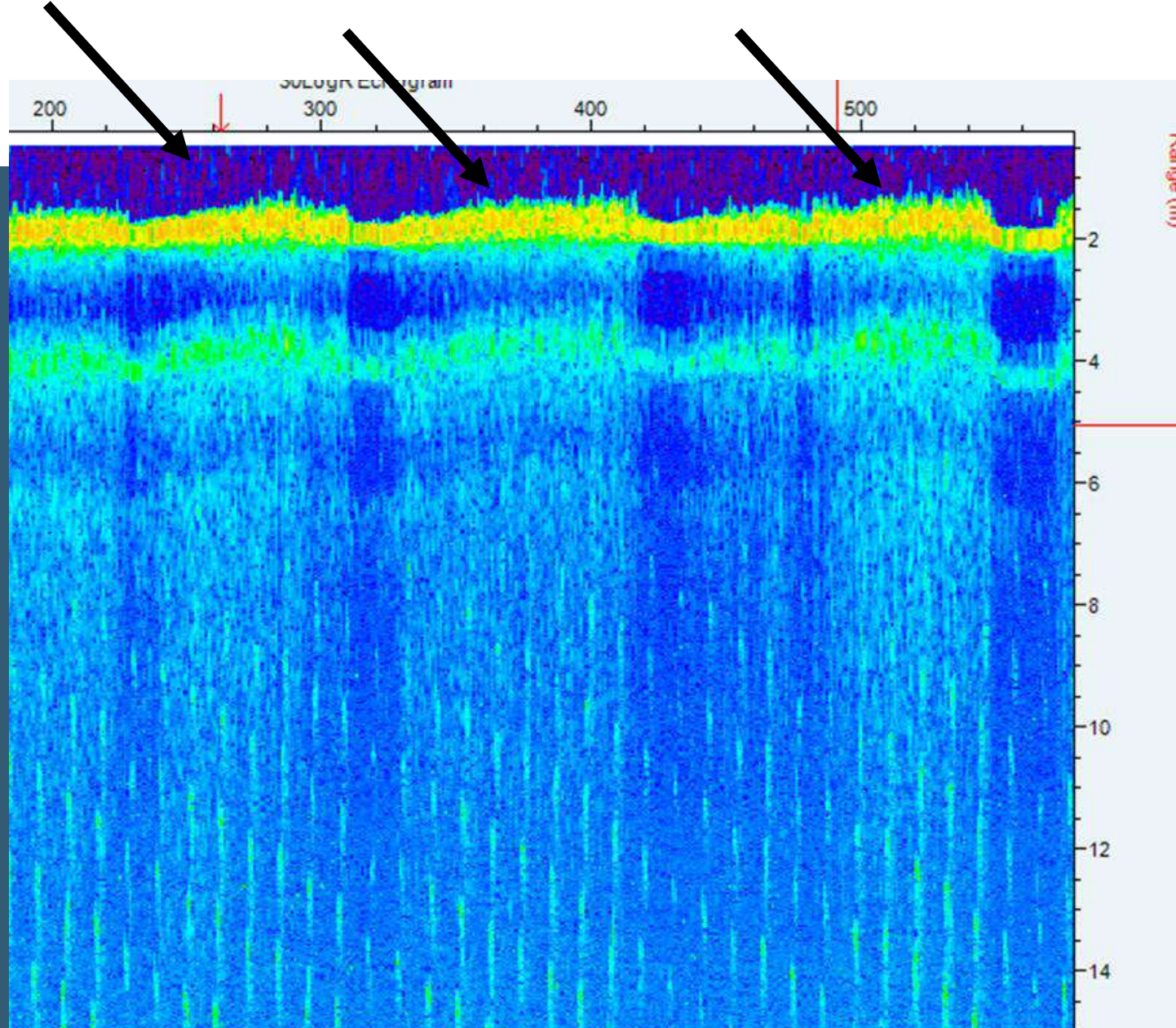


Image taken from <http://www.biosonicsinc.com/products/mx-aquatic-habitat-echosounder/>



INITIAL RESULTS

- We found SAV!
- This echogram indicates SAV is found along this transect.
 - We then rake for species identification and confirmation



INITIAL RESULTS: RAKING FOR CONFIRMATION



INITIAL RESULTS: SPECIES IDENTIFICATION



*Najas
guadalupensis*



Najas minor



*Zannichellia
palustris*

INITIAL RESULTS: SPECIES IDENTIFICATION



Ceratothylus
demersum



Hydrilla
verticillata

LOTS AND LOTS OF WILD CELERY!

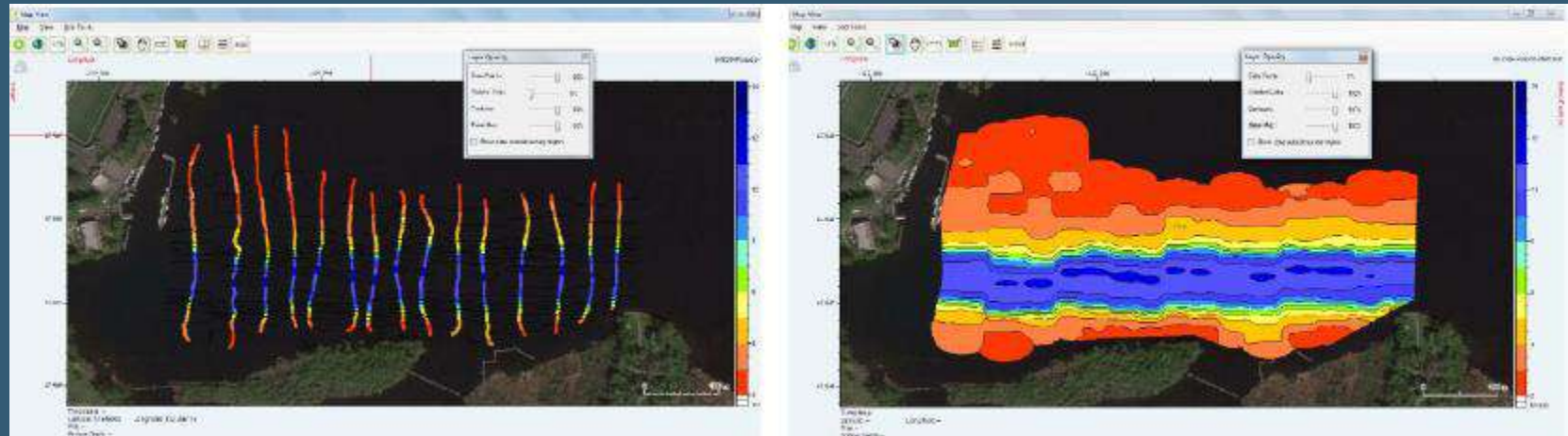
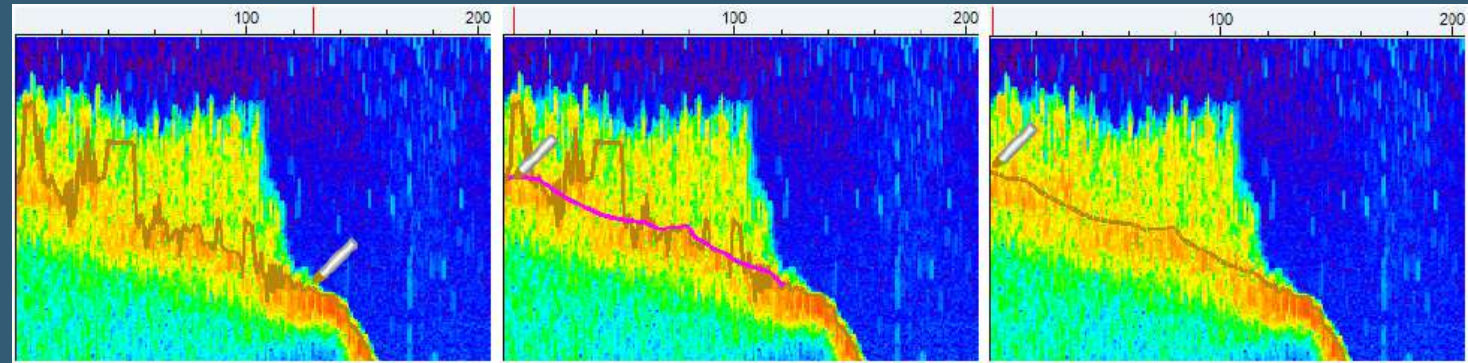


PRELIMINARY DISCUSSIONS

- SAV has a distinct 'sweet zone' for growth in the Delaware Estuary
- Promotes sediment accretion
- Favors lower energy locations
- No discernable shoreline needed (has grown on hardened and mowed shorelines)
- Appears to not tolerate the 'mixing zone'

NEXT STEPS

- 2018: Wilmington south to mouth of Bay
 - Survey area completed in 2017: Trenton to Wilmington Memorial Bridge
- Post processing of data by the Academy of Natural Sciences at Drexel University



Images taken from BioSonics Visual Habitat User Guide.

QUESTIONS?