

Submerged Aquatic Vegetation (SAV) Mapping in Lake Trafford 2015



Serge Thomas and Edwin Everham
FGCU – IERG, \$10,000 award

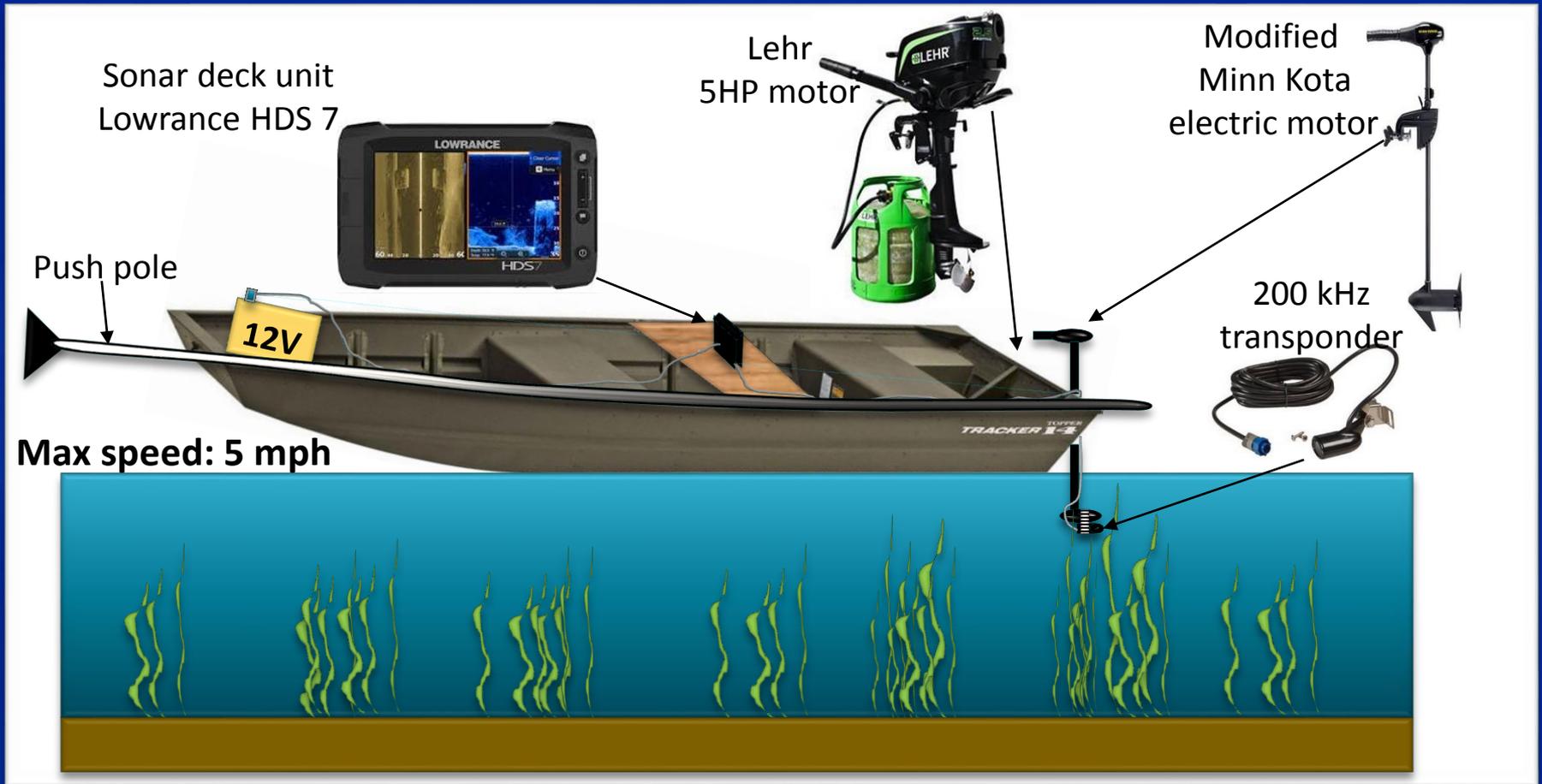
Objectives

- Estimate restoration success through assessment of SAV coverage and monitor changes in SAV coverage over time
- Provide additional monitoring of hydrilla for FWC

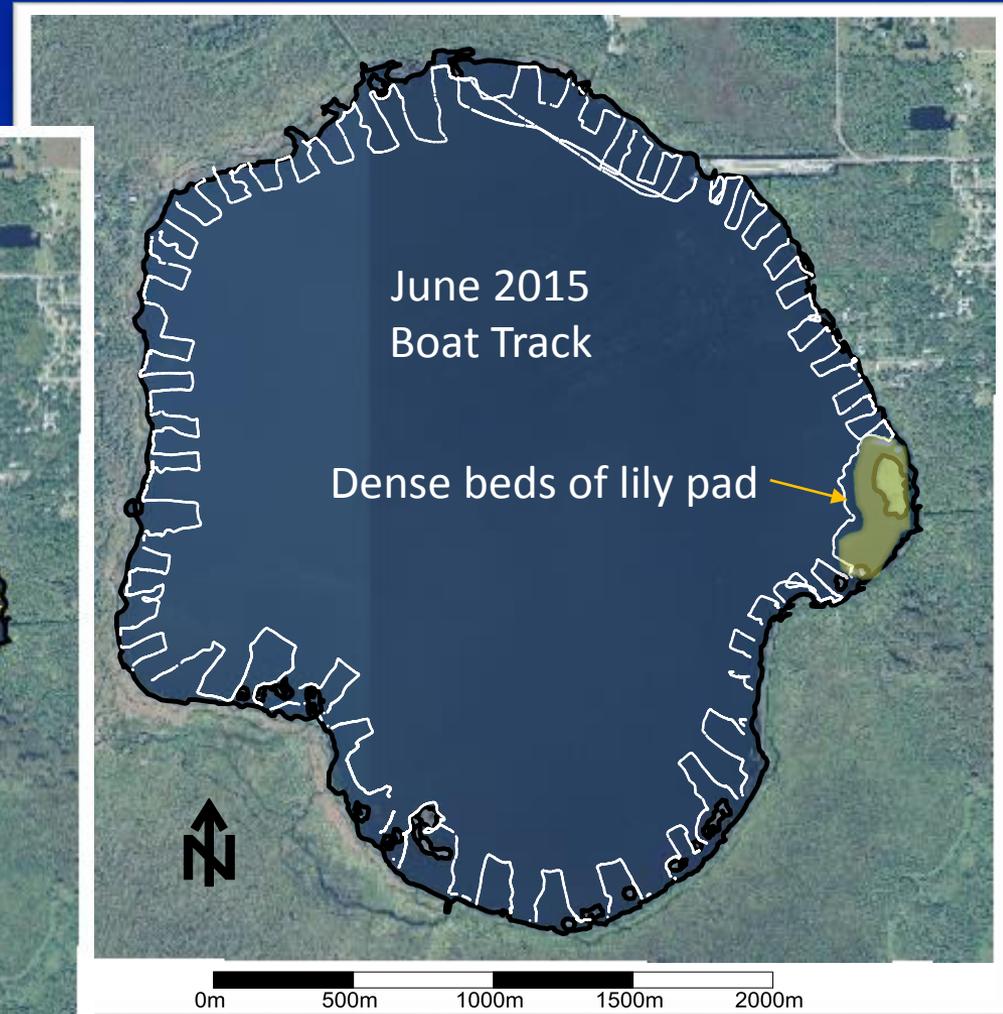
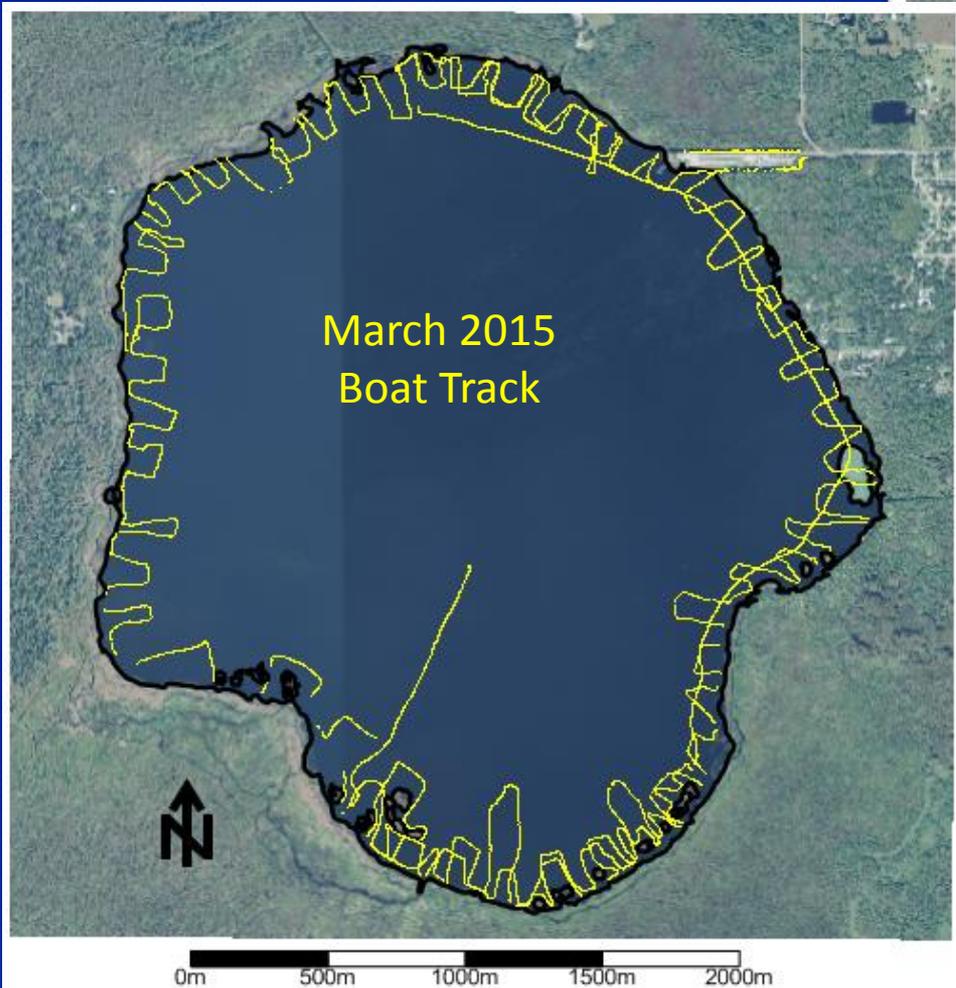
Methods

- Indirect (SONAR) Mapping
 - ✓ Rapid and continuous data acquisition
 - ✓ High spatial resolution
 - ✓ Cannot distinguish SAV species
 - ✓ Cannot be used when depth is less than 0.73 m (2.4 ft)
- Direct Mapping
 - ✓ Slow and meticulous data acquisition
 - ✓ Visual identification and mass of SAV species obtained
 - ✓ Labor intensive
 - ✓ Discrete sampling

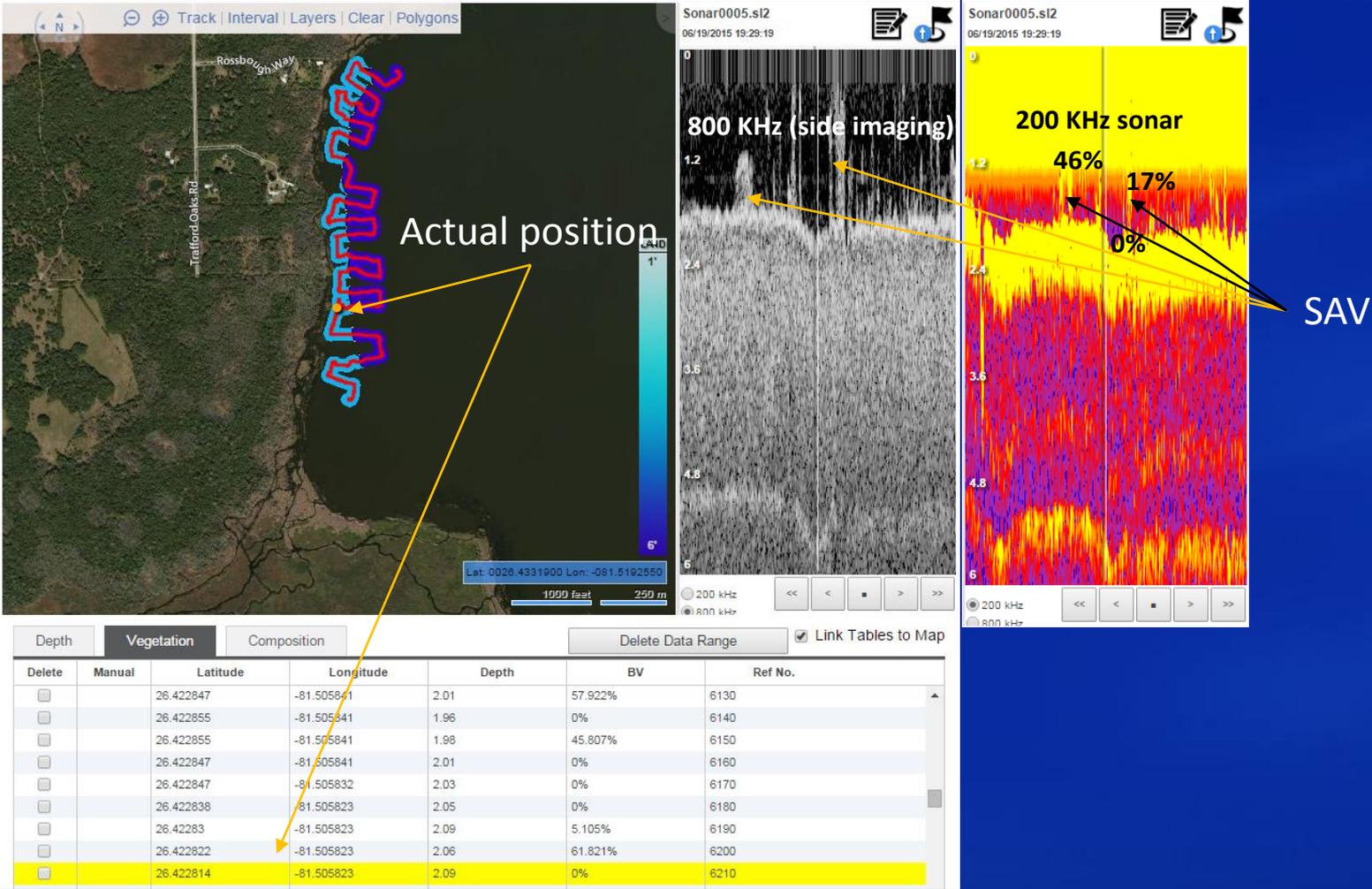
Indirect Mapping



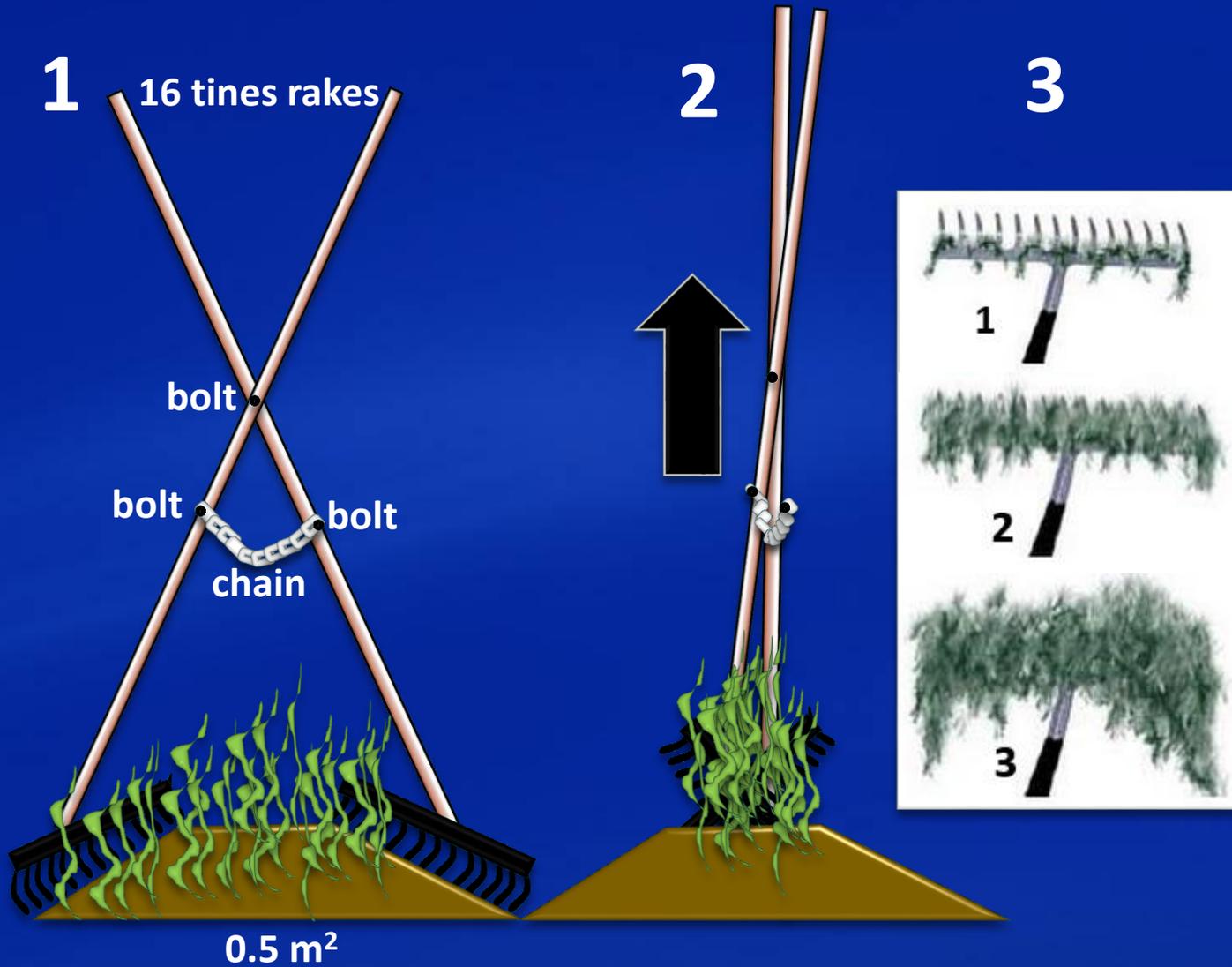
Indirect Mapping



Indirect Mapping



Direct Mapping



Separate species and weigh each species individually to the nearest 5g.

Repeat two more times!

Per Rodusky et al. 2005 (Lake Okeechobee)

Direct Mapping

March 2015

16 transects (69 stations)
500 - 650 m interspaced



0m 500m 1000m 1500m 2000m

June 2015

32 transects (134 stations)
150 - 350 m interspaced



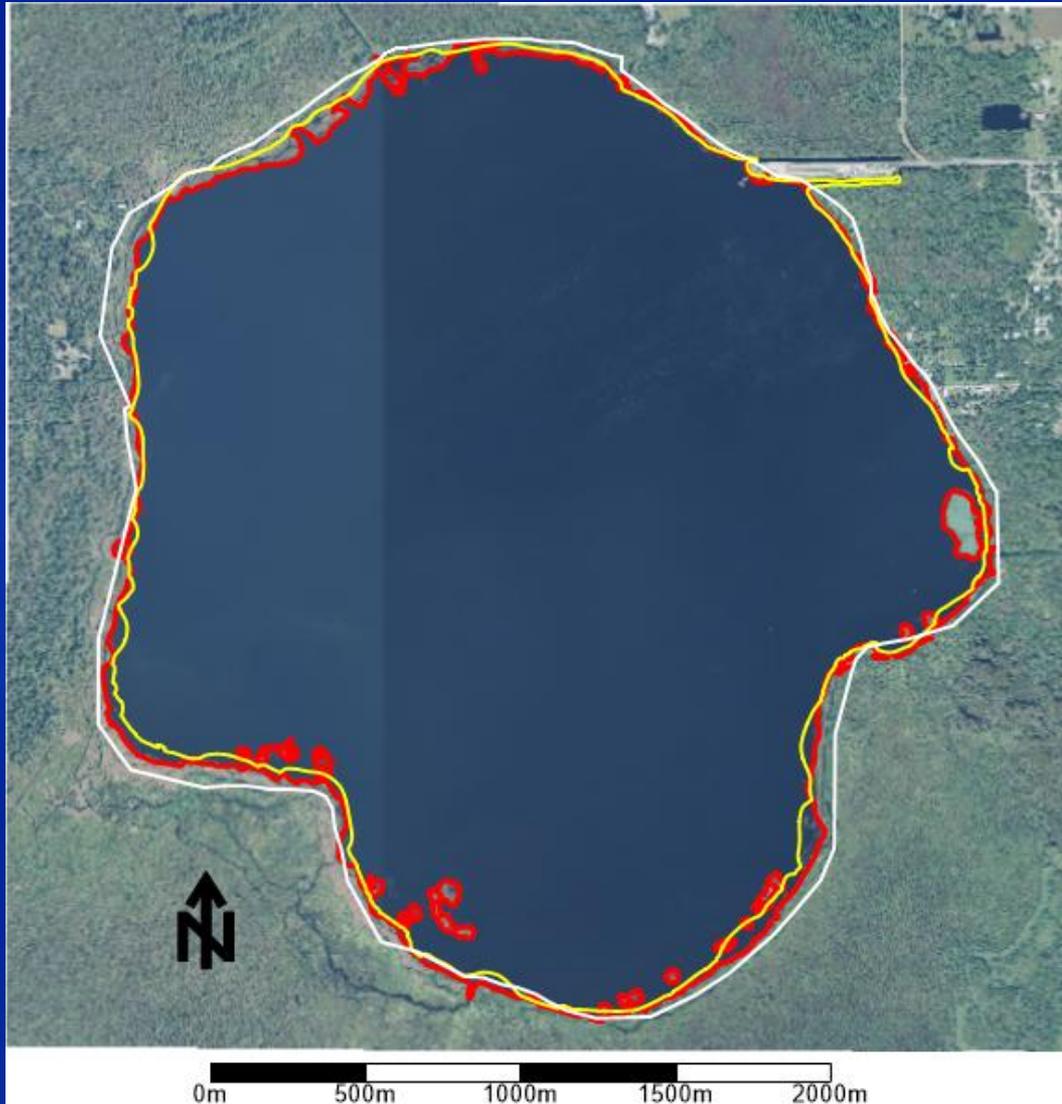
0m 500m 1000m 1500m 2000m

Direct Mapping



Photos: J. Schmidt, SFWMD

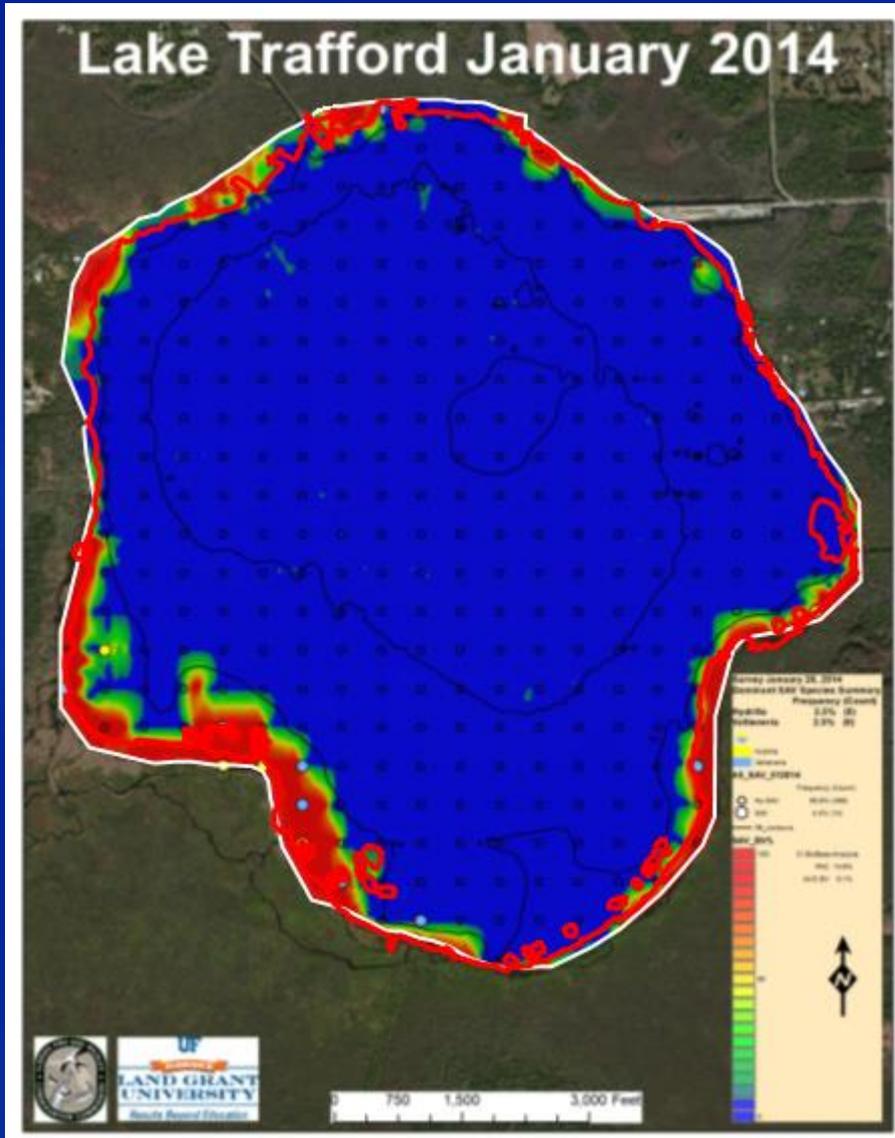
Indirect and Direct Mapping



Shoreline Variability

1. 19.5 ft NGVD
2. CioBiobase.com
3. Shoreline Used

Indirect and Direct Mapping



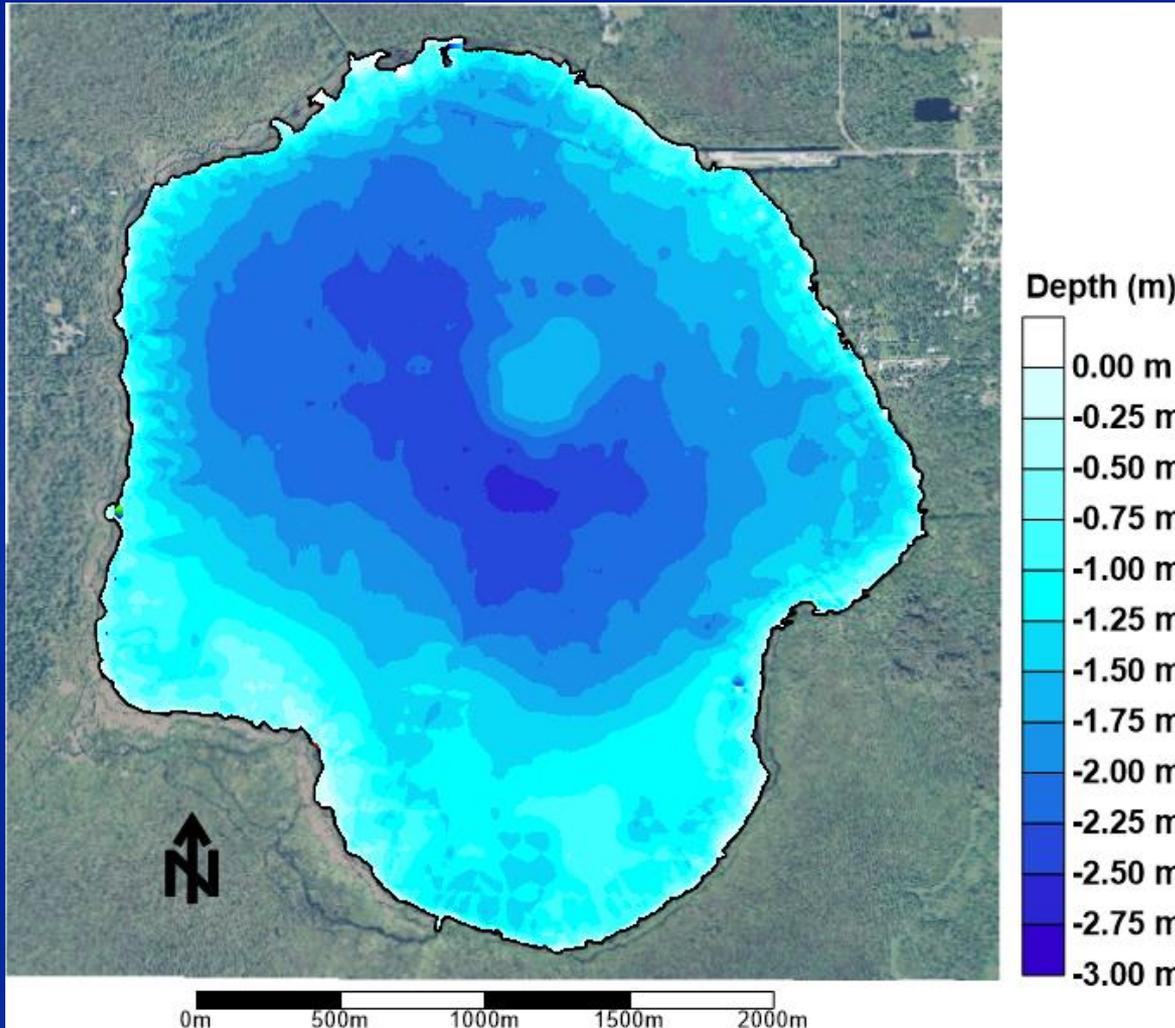
Shoreline Variability

1. 19.5 ft NGVD
2. CioBiobase.com
3. Shoreline Used

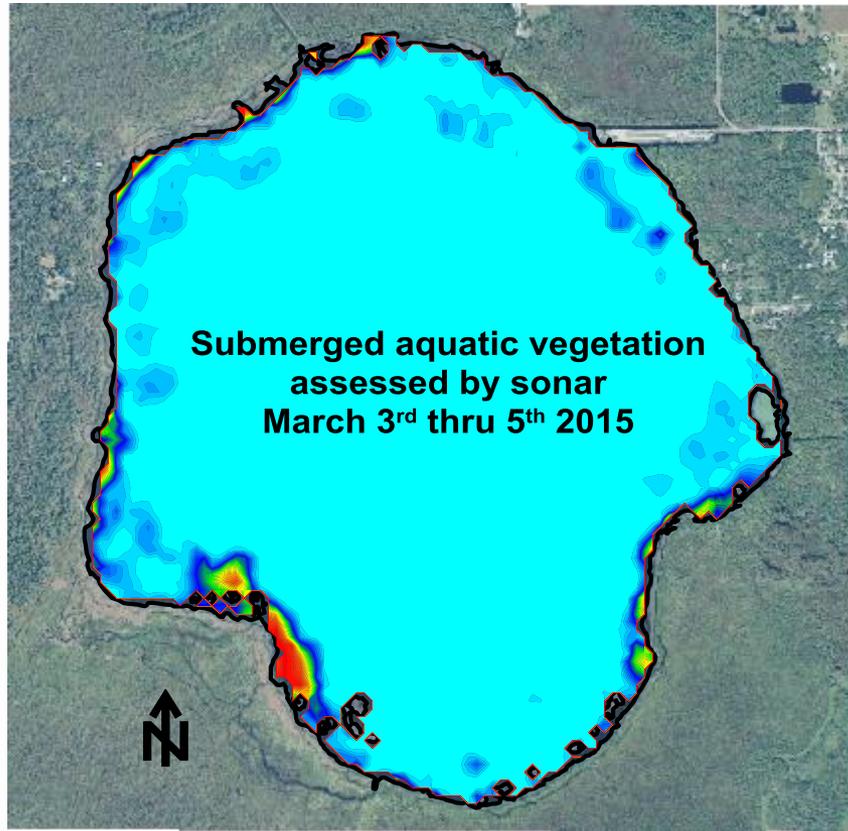
Indirect and Direct Mapping

Bathymetry Variability

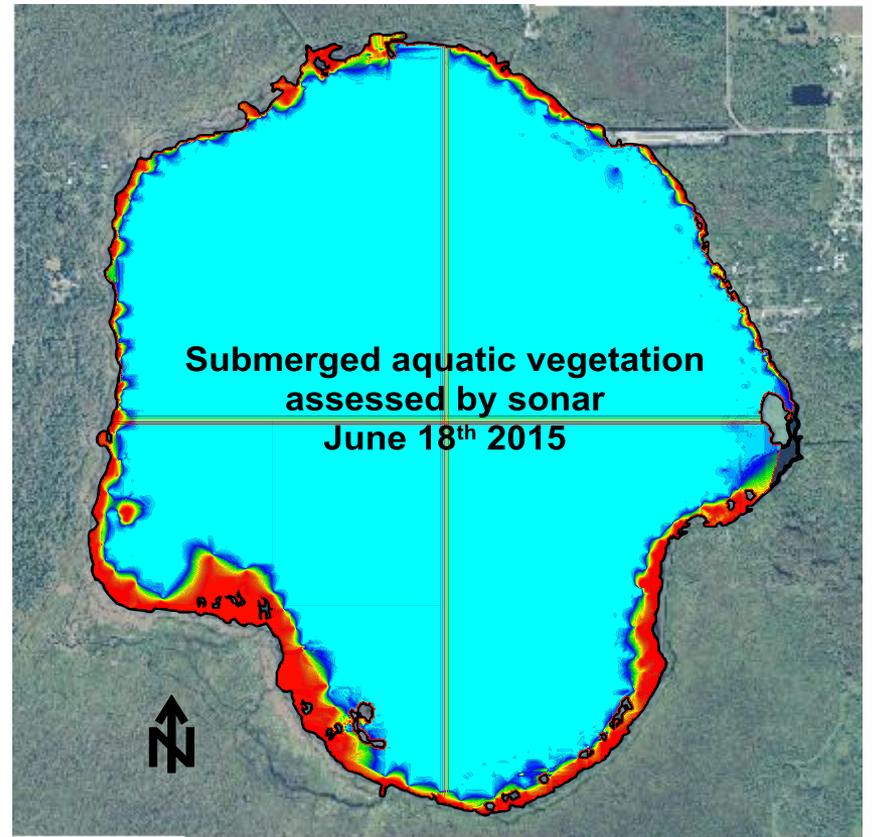
0 m = 19.5 ft
NGVD



Results: Indirect



0m 500m 1000m 1500m 2000m

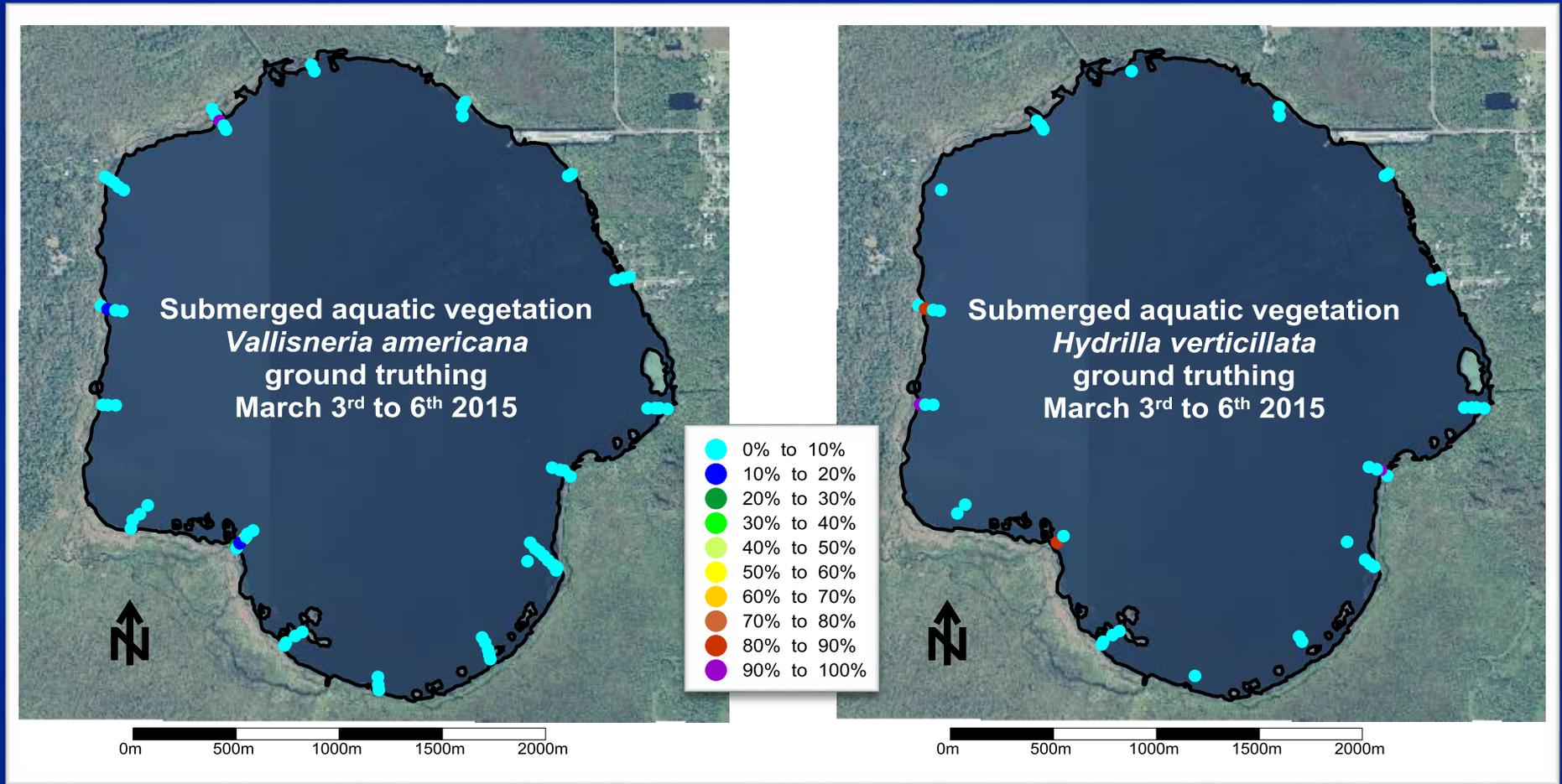


0m 500m 1000m 1500m 2000m

- 7.8% SAV Cover
- 113.6 acres

- 10.6% SAV Cover
- 179.2 acres

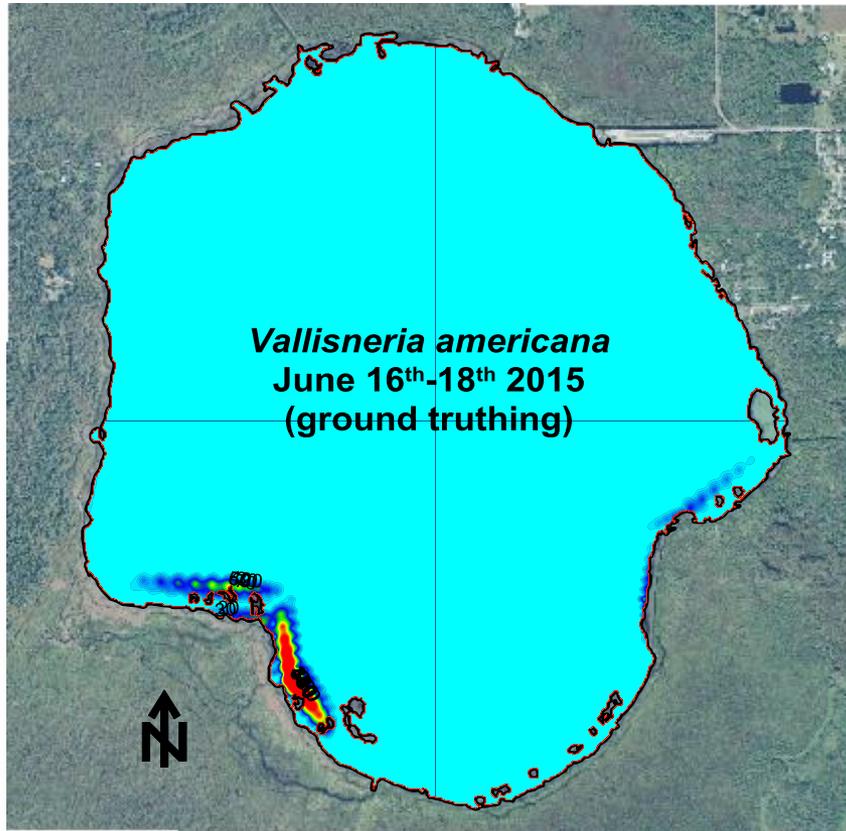
Results: Direct by Species



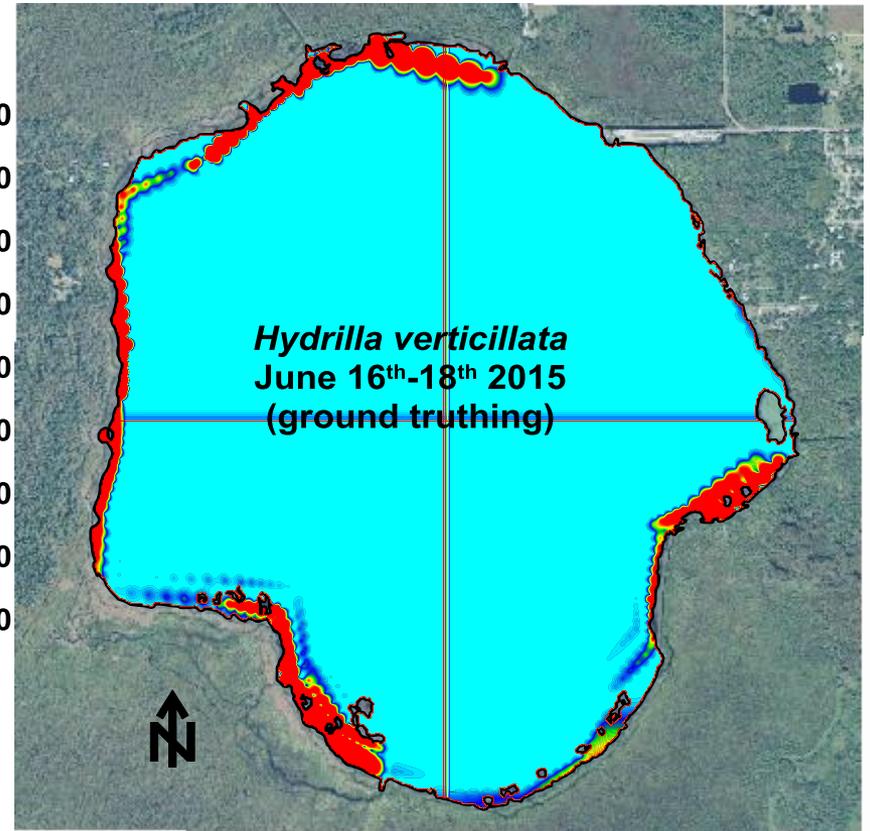
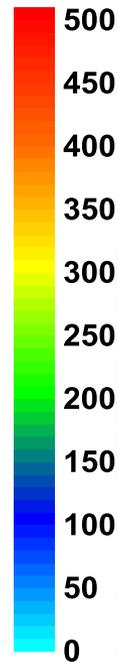
- Found at 8 of 29 stations
- Biomass up to 0.4 kg/m²

- Found at 20 of 29 stations
- Biomass up to 5.1 kg/m²

Results: Direct by Species



0m 500m 1000m 1500m 2000m



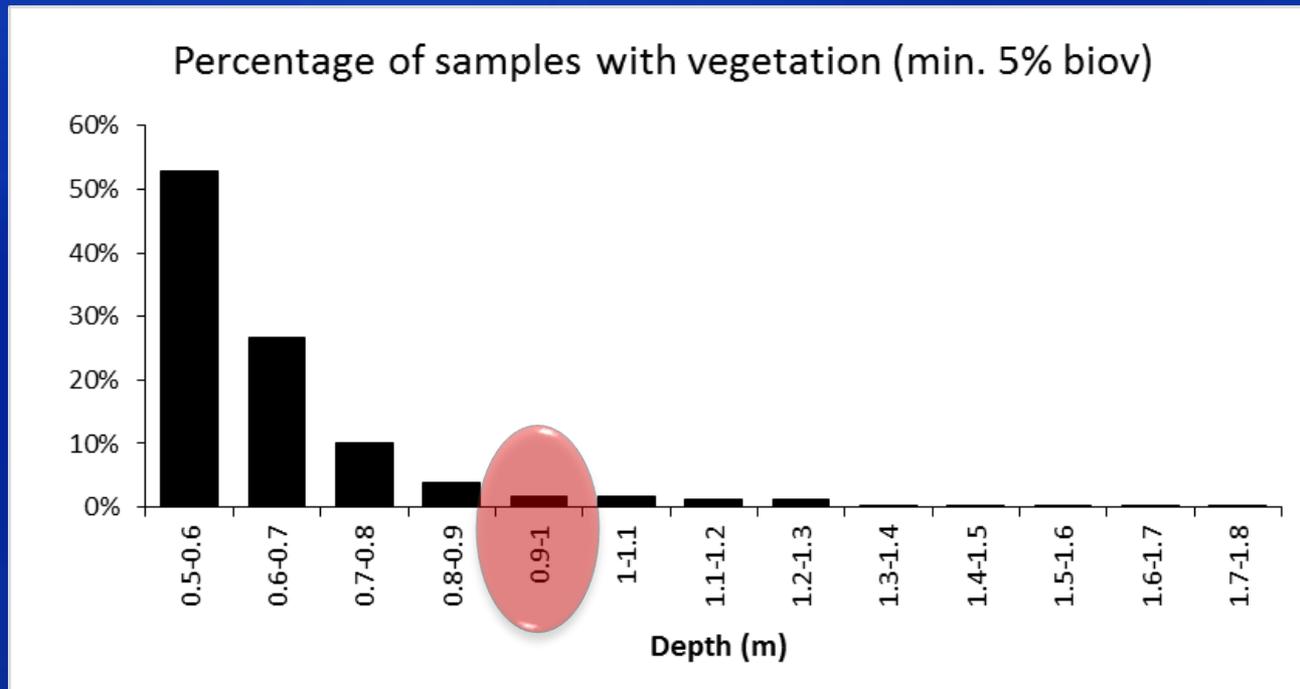
0m 500m 1000m 1500m 2000m

- 1.9% of Total SAV Cover
- 28.7 acres
- Biomass up to 1.5 kg/m²

- 7.4% of Total SAV Cover
- 111 acres
- Biomass up to 19 kg/m²

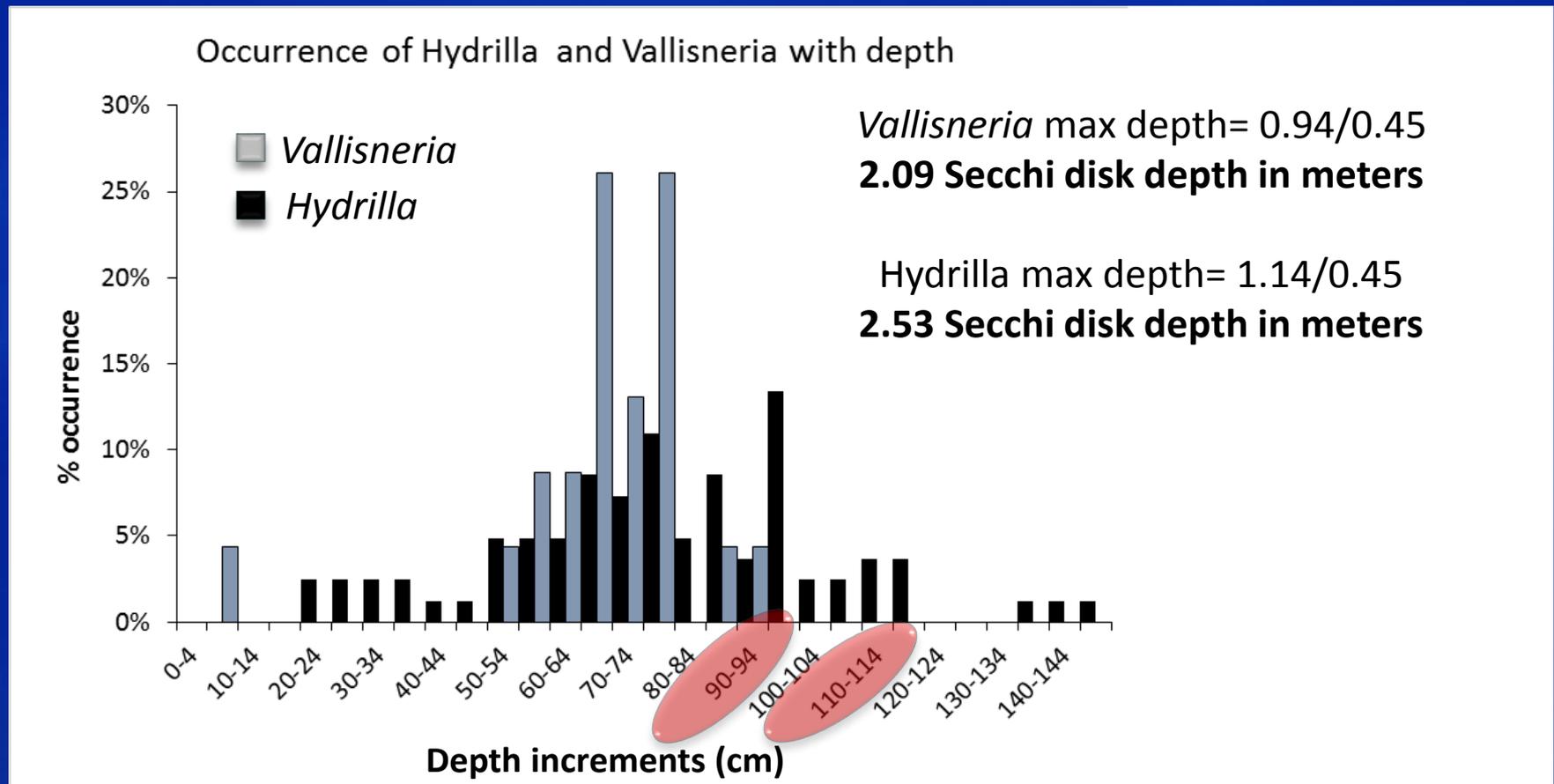
Results: Discussion

- Extent of SAV with depth (June 2015)
 - ✓ Direct mapping data
 - ✓ 0.9 - 1.0 m is 2.25 - 2.50 times Secchi Disk depth (0.4 - 0.5m)



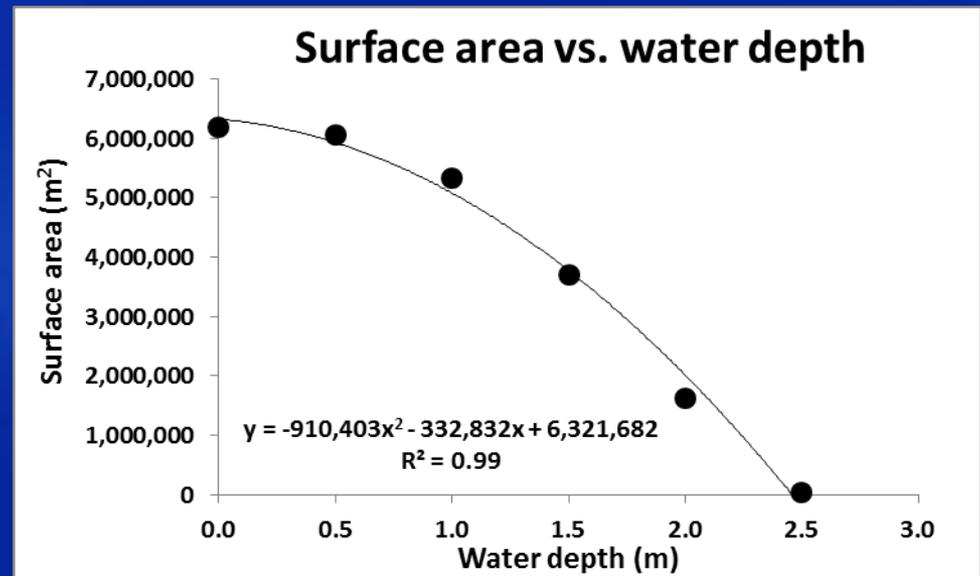
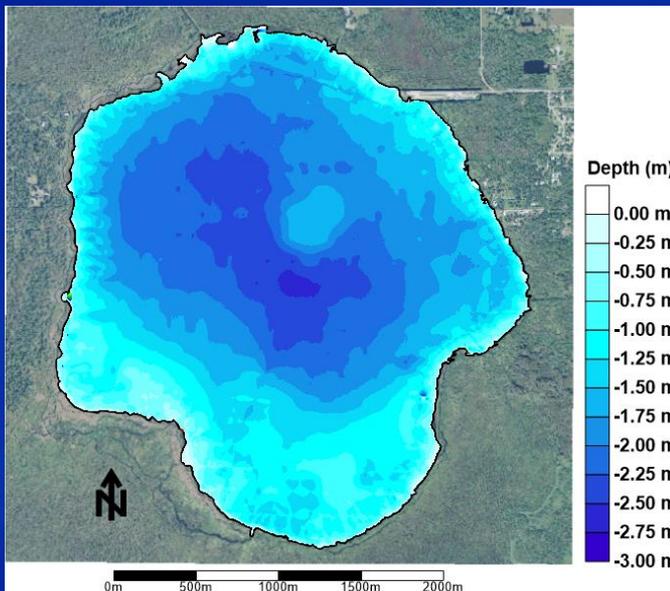
Results: Discussion

- Extent of SAV with depth (June 2015)
 - ✓ Direct mapping data



Results: Discussion

- Secchi disk depth for 30% SAV cover



Solve equation for 30% of SAV cover (i.e. 1852410 m² or 458 acres)

SAV needs to expand to all depths from 0m until 2.04m

For *Vallisneria*, this means a Secchi disk of:

2.09 Secchi disk = 2.04 \Leftrightarrow Secchi disk = 0.98 m

For *Hydrilla*, this is a Secchi disk of:

2.53 Secchi disk = 2.04 \Leftrightarrow Secchi disk = 0.81 m

Our target was 1 m!

Conclusions

- SAV covered 7.8% of L. Trafford in March 2015 and 10.6% in June 2015
- SAV is very largely dominated (92% in March 2015, 89% in June 2015) by *Hydrilla* which seems to invade *Vallisneria* beds
- *Hydrilla* is more spread out with depth than *Vallisneria* and can expand to greater depths
- SAV extends to 0.9 - 1.0 meter with a Secchi disk depth of 0.4 - 0.5 m. The restoration target is 1 m Secchi disk depth.
- One can predict maximum depth extension of *Vallisneria americana* and *Hydrilla*.
- 1 m Secchi disk depth for 30% of SAV cover is a realistic target
- SAV mapping proved to be a valuable tool to assess L. Trafford restoration success. It is however labor intensive if done right.
- Because of a low Secchi disk depth recorded and the extensive beds of *Hydrilla*, more monitoring and efforts are needed to orient L. Trafford's recovery.

Moving Forward

- Continuation of ongoing efforts
 - ✓ Proceed with well established methods for SAV mapping in FY16 but with a greater budget
 - ✓ Facilitate recovery of native SAVs through restoration planting
 - ✓ Coordinate restoration, management, and monitoring efforts to practice adaptive management and guide recovery of the lake
- Additional options for consideration
 - ✓ Extend mapping to emergent vegetation using potentially drone imaging technology
 - ✓ Delineate with precision the shoreline of L. Trafford based on the average level of L. Trafford (19.5 ft NGVD)
 - ✓ Assess using a combination of motion sensing cameras and adequate equipment to measure turbidity, nutrient loading, and water flow the effect of airboat disturbance on L. Trafford water quality.