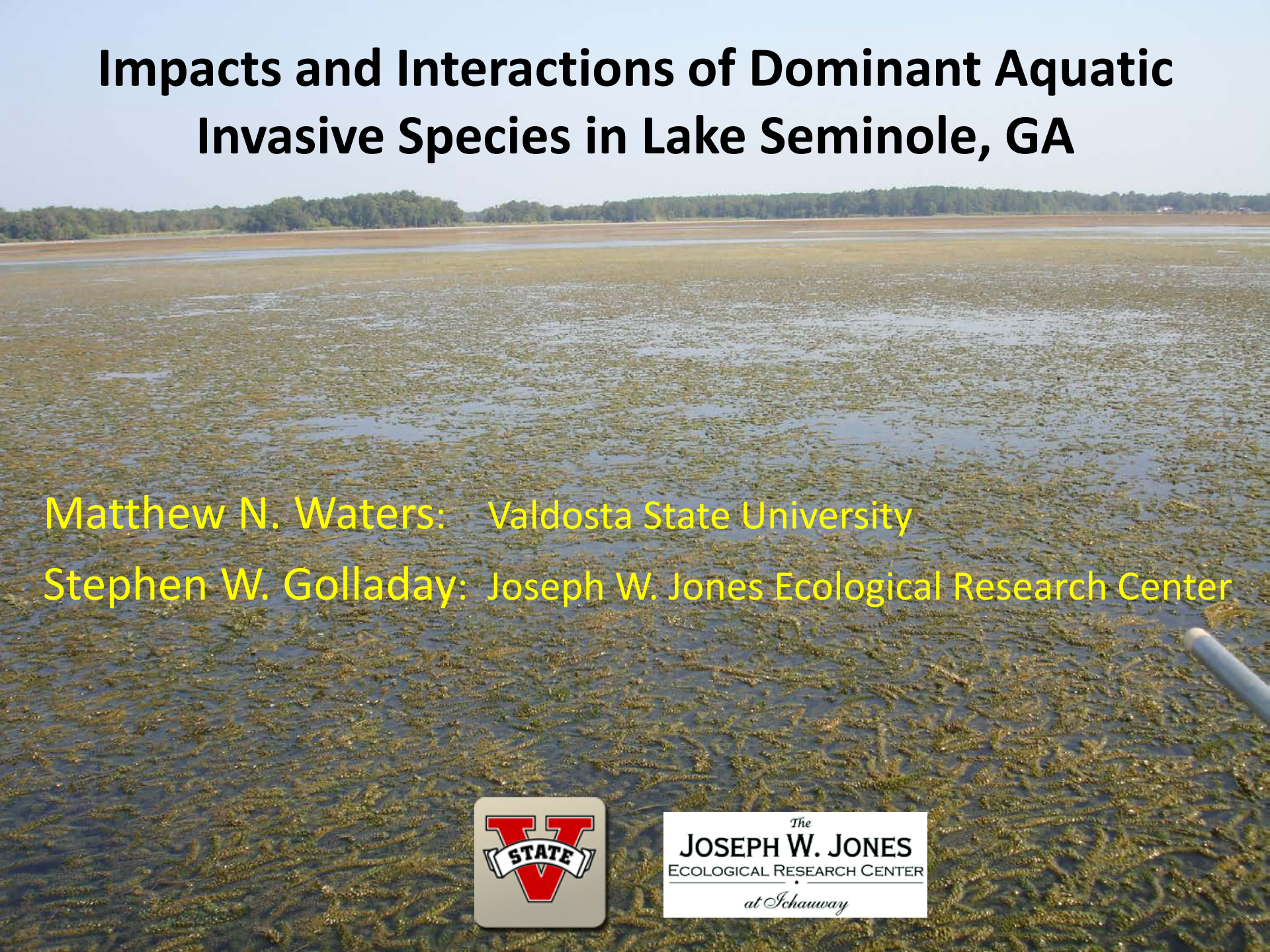
Impacts and Interactions of Dominant Aquatic Invasive Species in Lake Seminole, GA



Matthew N. Waters: Valdosta State University

Stephen W. Golladay: Joseph W. Jones Ecological Research Center

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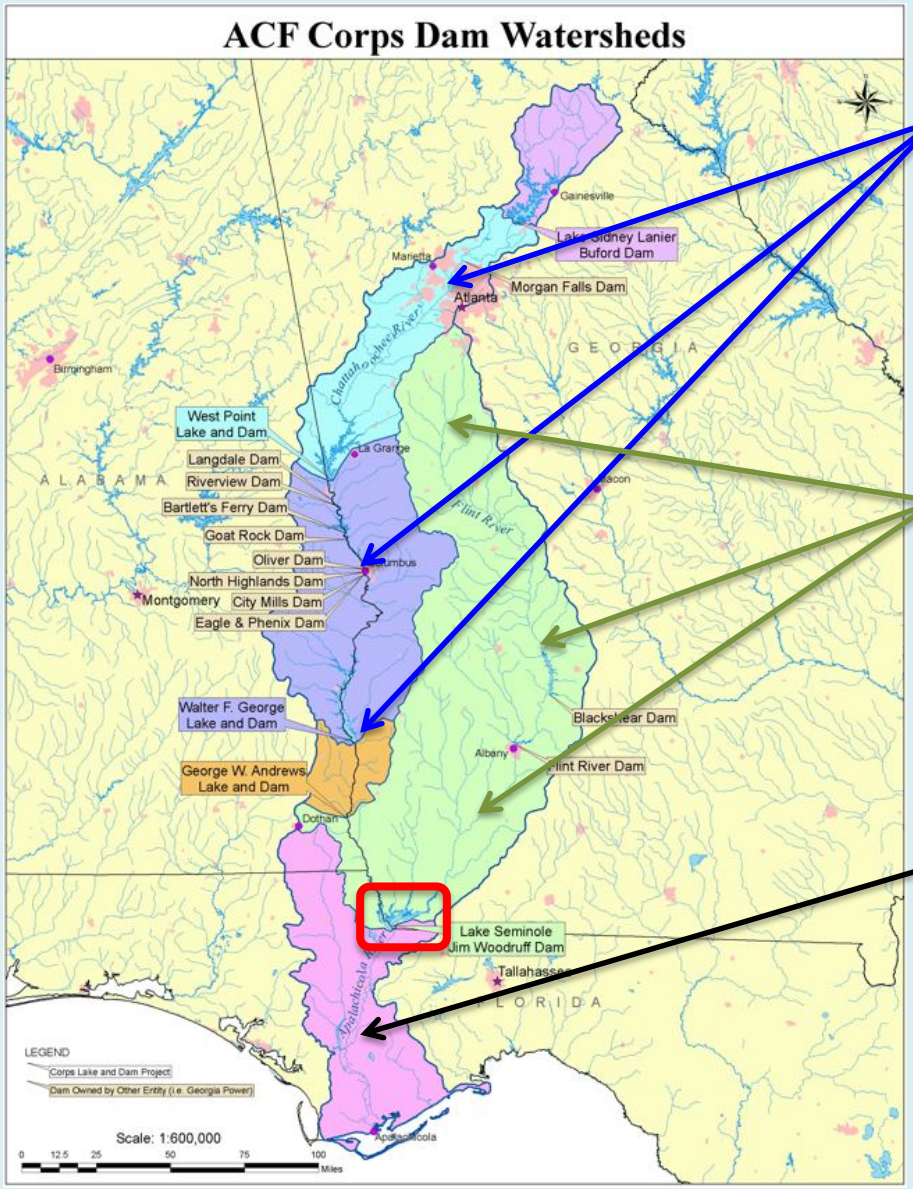
Valdosta State University: **Chase Patrick,** James Ragan, Ted West, Josh Boston,

University of Georgia: Alan Covich

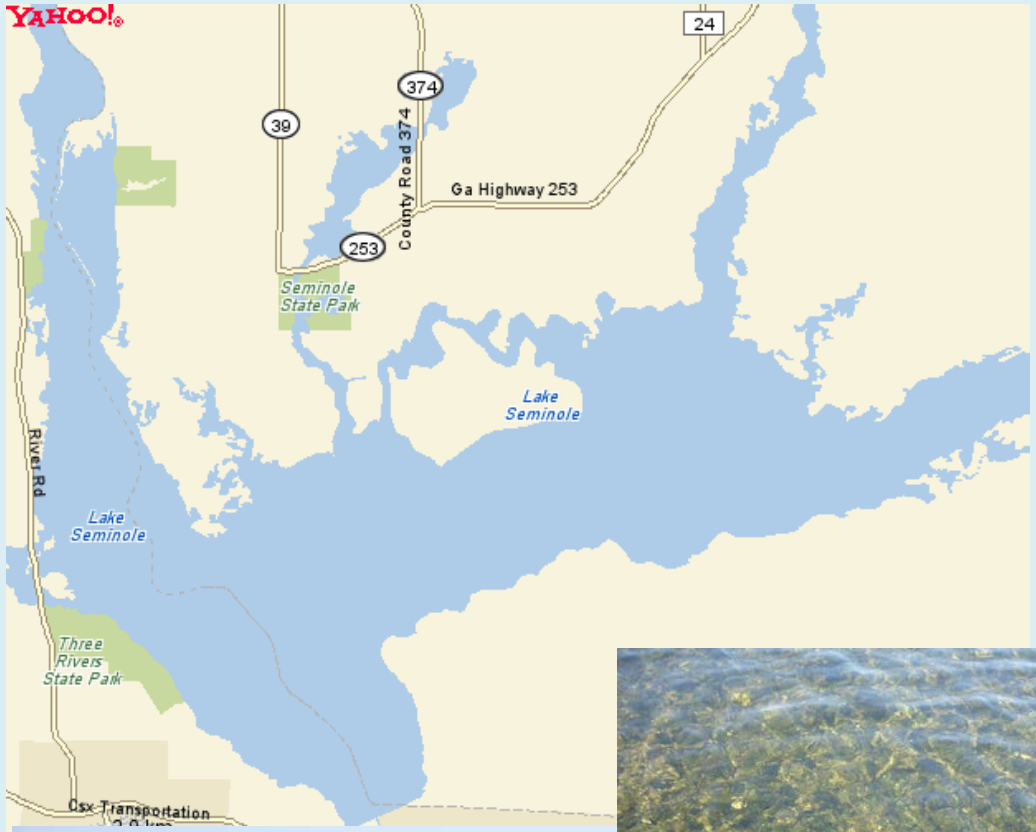
Apalachicola-Chattahoochee-Flint (ACF) River Basin



- Chattahoochee Basin:
  - Industrial-Atlanta/Columbus
    - Municipal water use
  - 13 Dams
- Flint Basin:
  - Agricultural water use
    - Pivot irrigation
  - 2 Dams “Run of the River”
- Apalachicola Basin:
  - Apalachicola Bay- 90% FL and 13% of US Oysters
- Lake Seminole

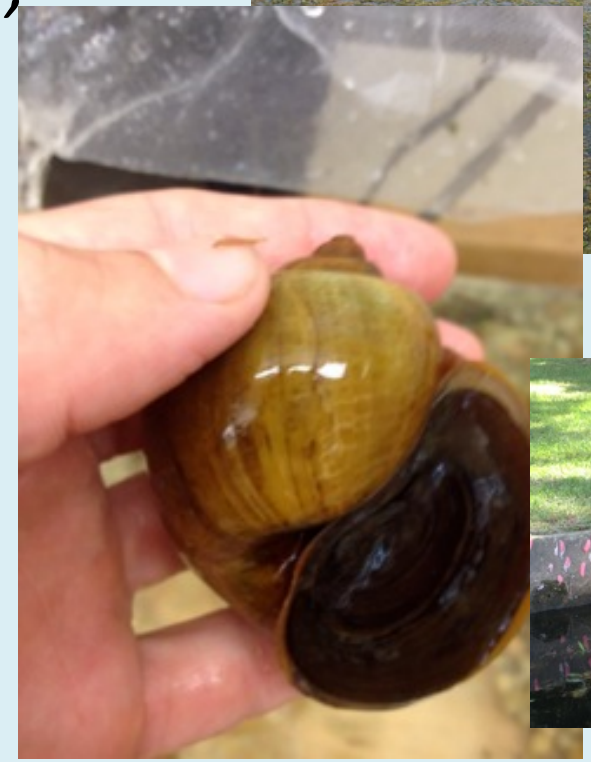
Lake Seminole

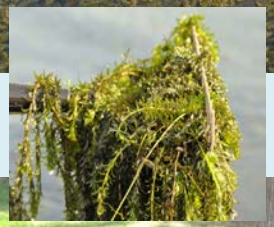
- Origin: 1952
- 152 km^2 – SA
- 3m depth
- Use: Fishing, Rec, Hydroelectric
- Hydrilla (up to 50%)
- *Management*
  - Hydrilla (carp and herbicides
  - Dam Release



Invasive Species in Lake Seminole

- *Hydrilla verticillata*
- *Corbicula fluminea*
- *Pomacea maculata (SA), Pomacea paludosa (FL)*

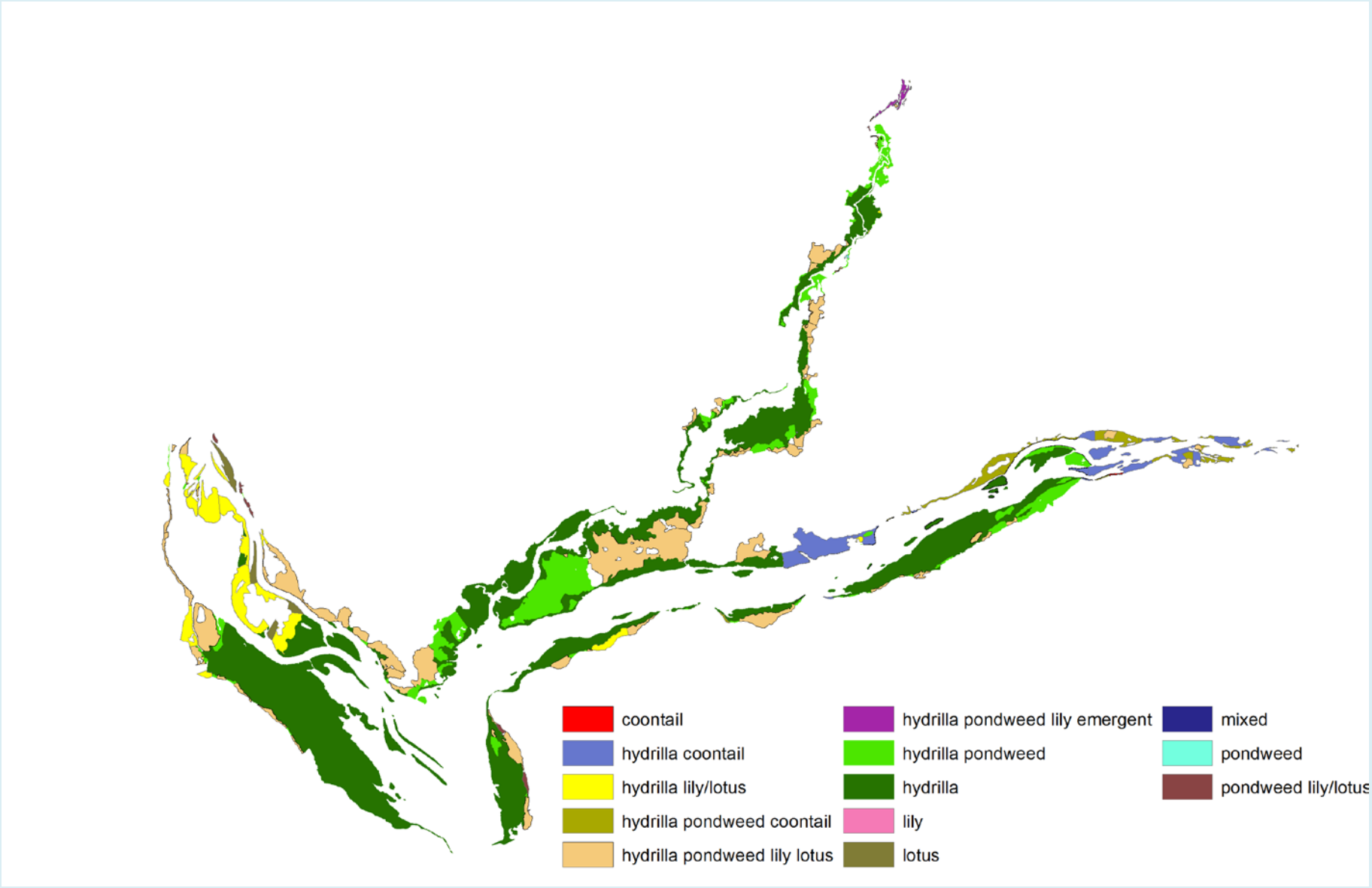




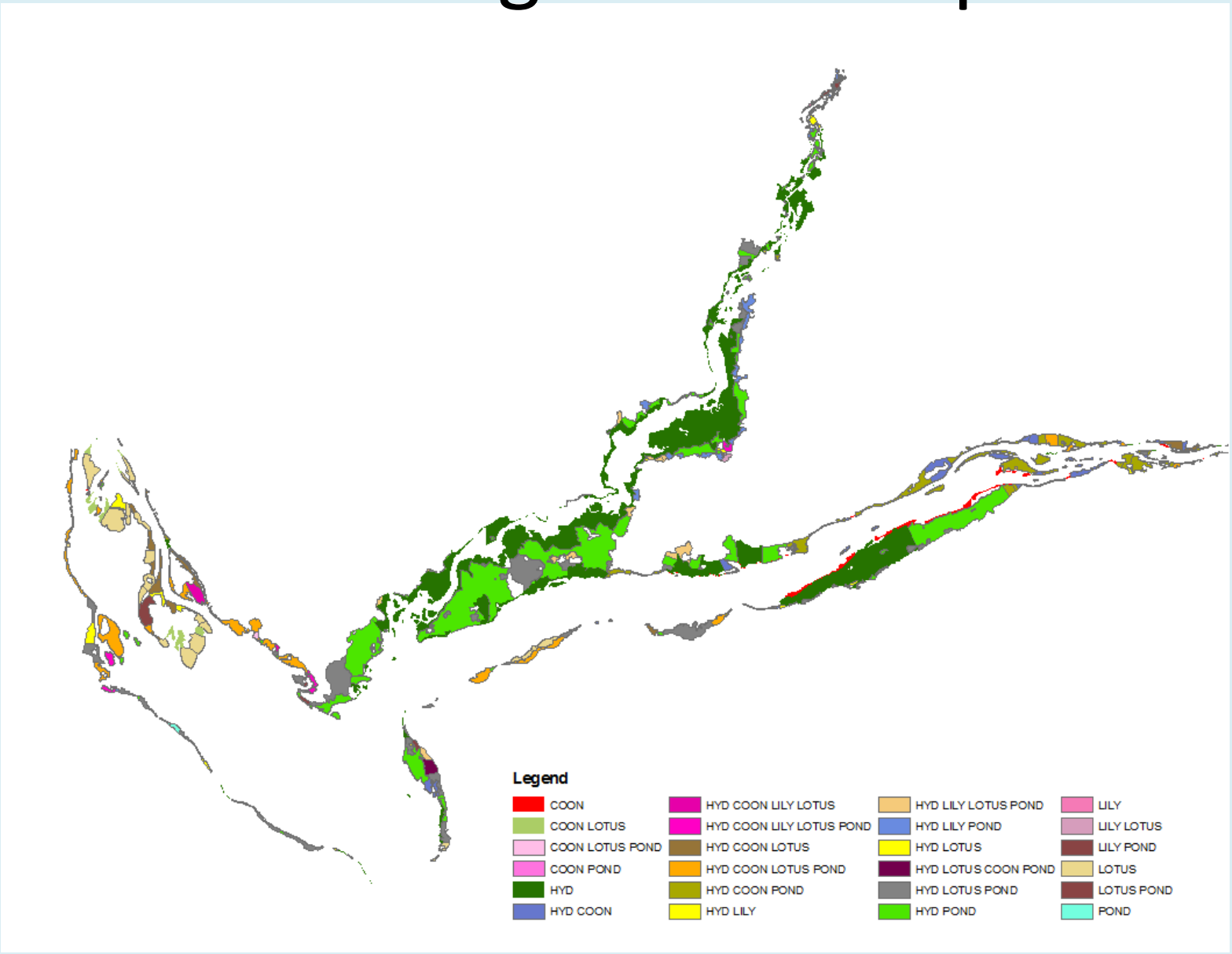
Objectives: 1) Continue density and distribution maps of the three invasive species in Lake Seminole. 2)Begin to look at the impacts of invasive species on sediment transport and lake ecology.

- Mapping
  - Hydrilla:2012, 2013, **2014**
  - Corbicula: 2012, **2015**
  - Pomacea: 2013, 2014, **2015**
- Sediment Transport
  - 2014-2015

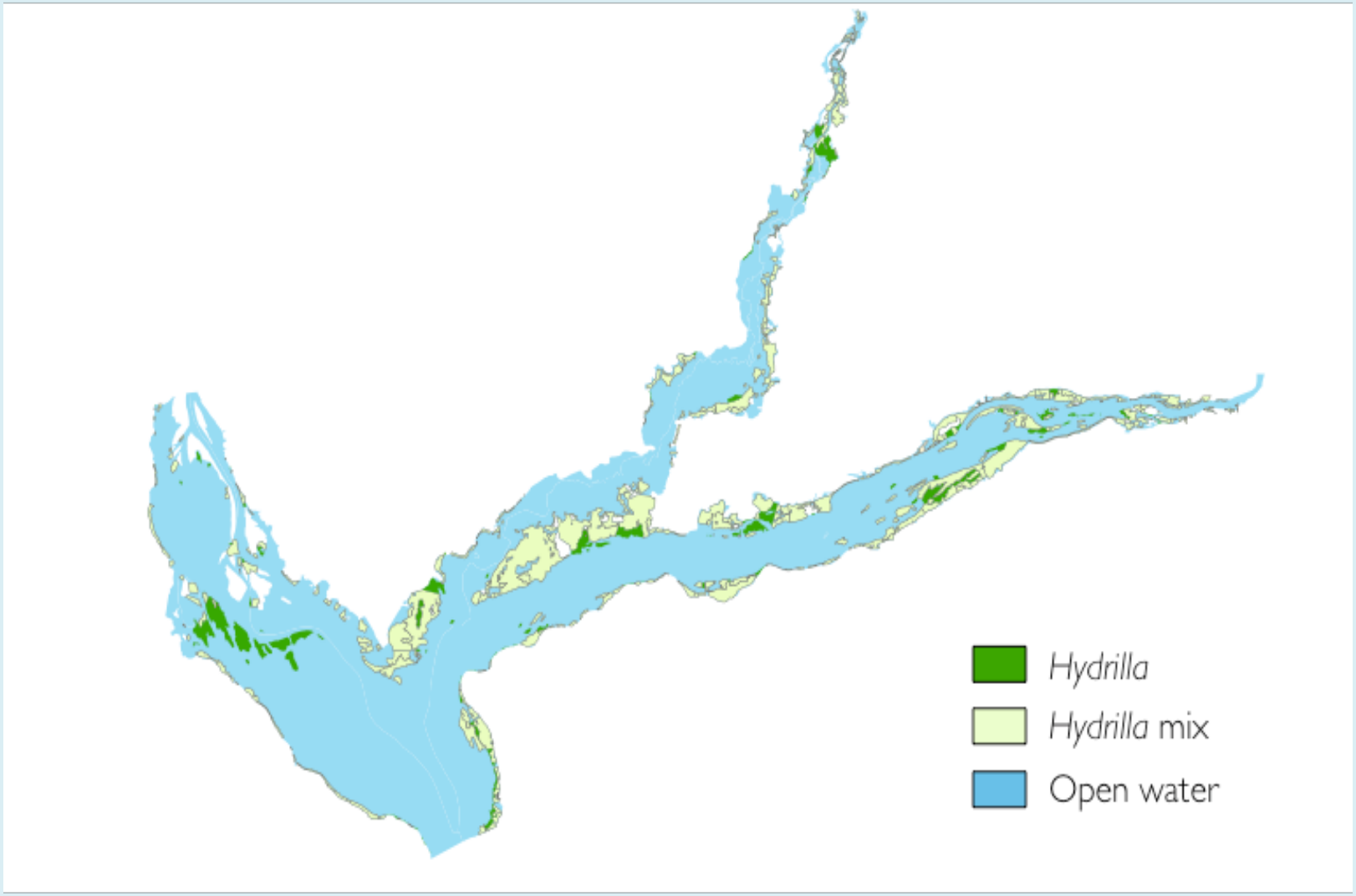
2012 Vegetation Map



2013 Vegetation Map

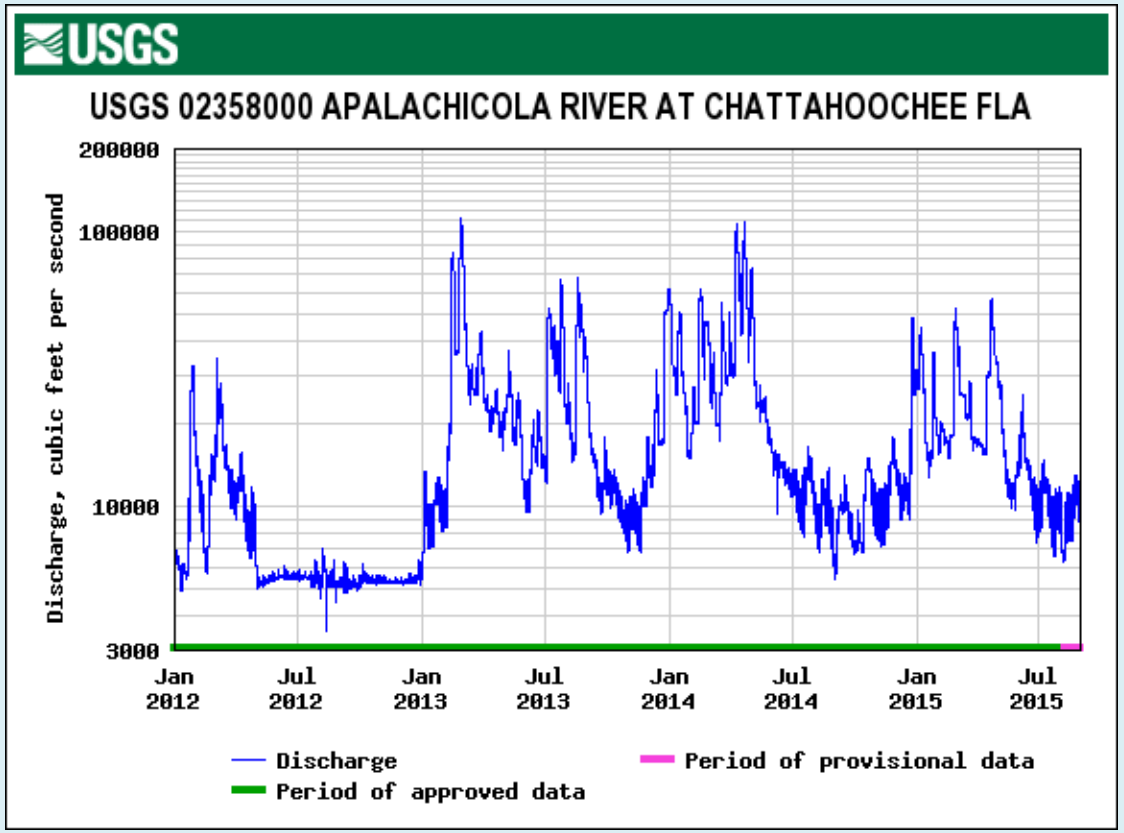


Vegetation Map 2014



Hydrilla Map Inferences

- Hydrilla and other SAV appear to be linked to precipitation
- % Coverages:
  - 2012: 48.2
  - 2013: 31
  - 2014: 25
  - 2015: ?



Stephen Shivers, PhD UGA

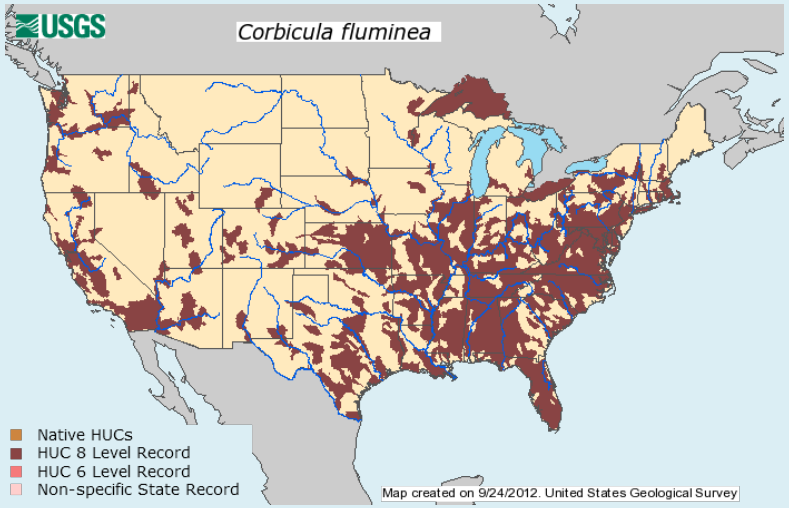
Corbicula Ponar Sample Sites

Photo courtesy of the BLM/USU National Aquatic Monitoring Center

Corbicula fluminea Summary

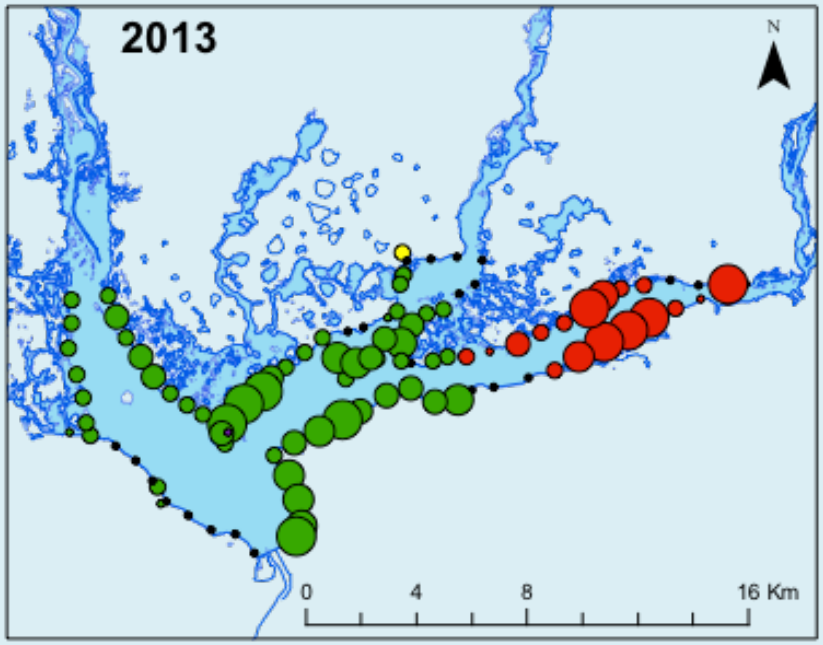
- 2012: 4.19 ± 0.79 billion
- 2015: 1.39 ± 0.39 billion
- Filtration
- Pelagic/Benthic coupling
- Linked to water depth
- Food source
- Accumulating metals

Photo courtesy of the BLM/USU National Aquatic Monitoring Center



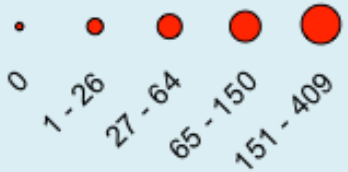
Chase Patrick, MS VSU

Pomacea sp.

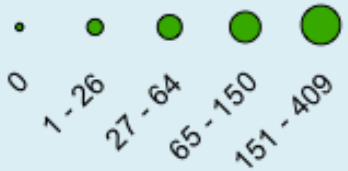


Both

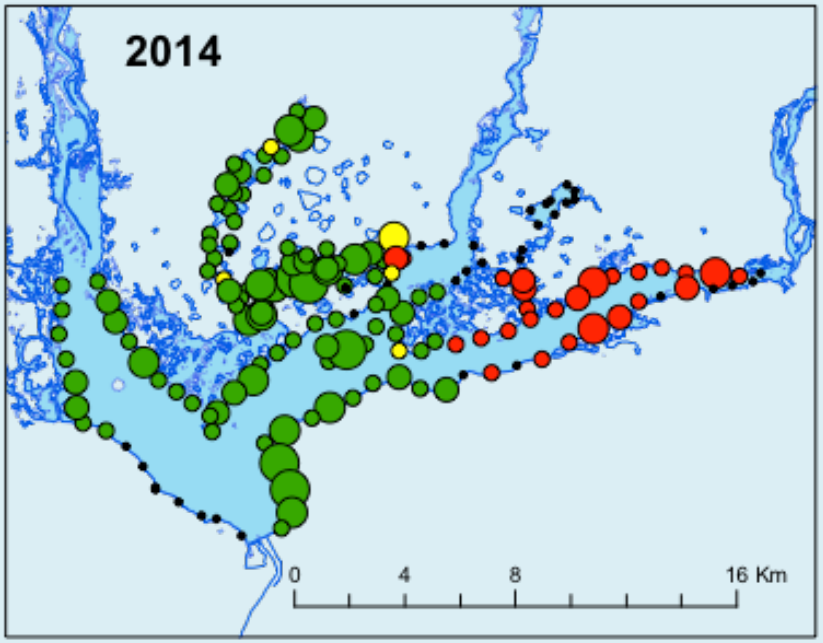
P. maculata (South America)

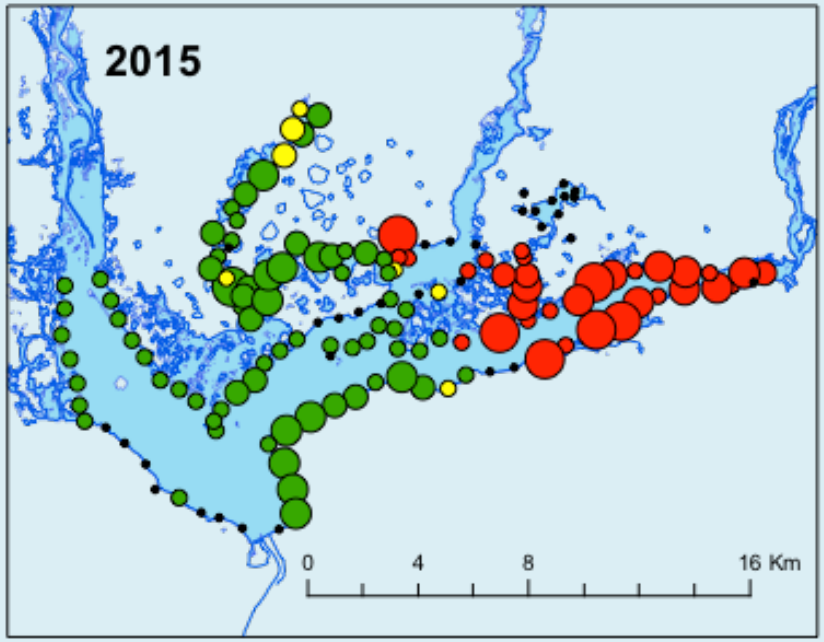


P. paludosa (Florida)



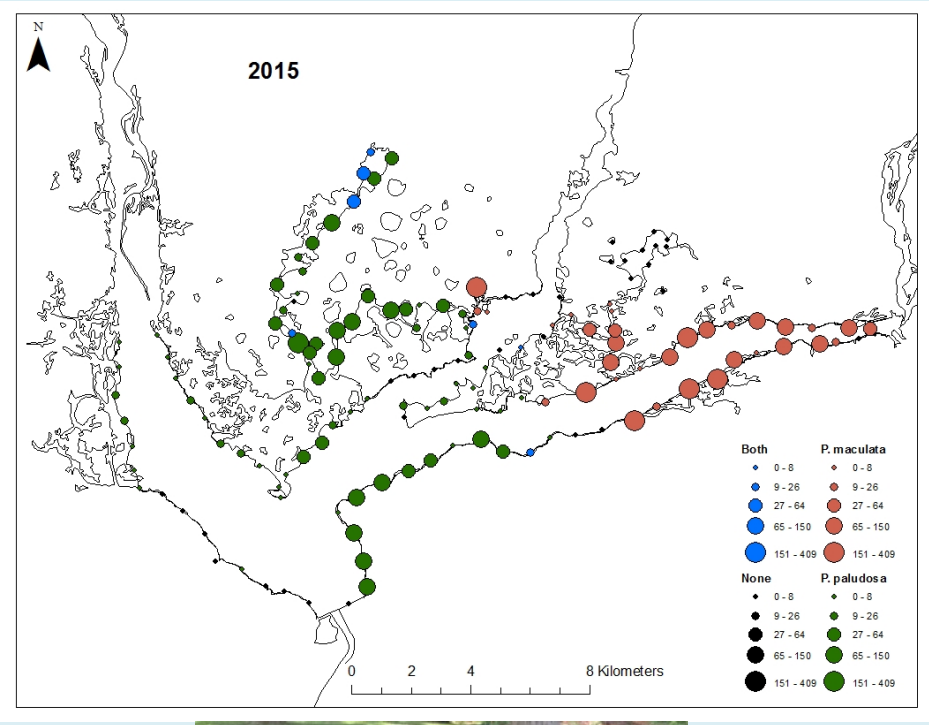
• No Egg Masses Observed





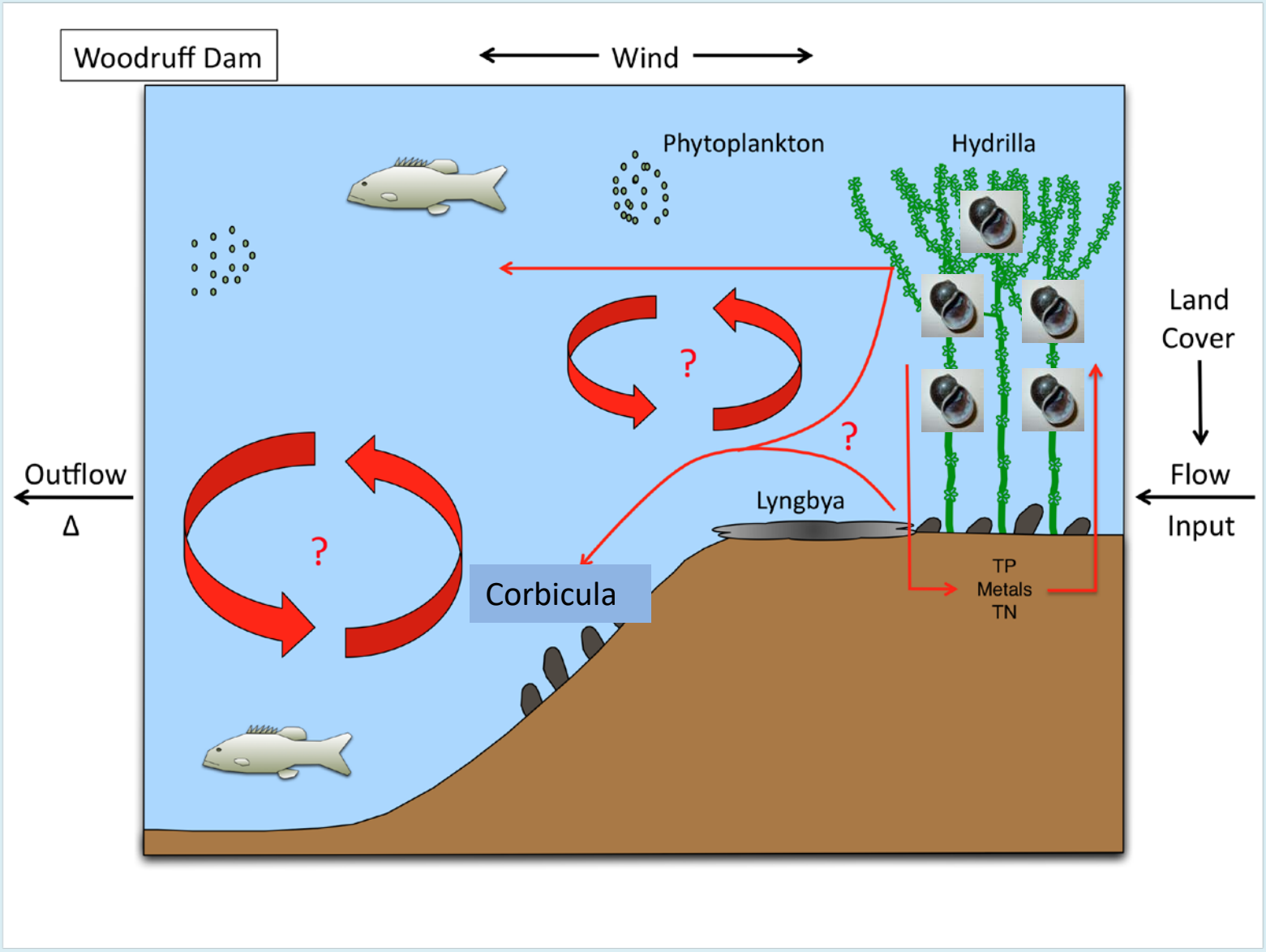
Pomacea Summary

- Largely concentrated on the Flint and Spring Creek arms
- Very few sites contained both species
- Unknown impacts on *Hydrilla* coverage
- Relationship between egg masses and population density?



Nick Marzolf ,MS UGA

Invasive species interactions

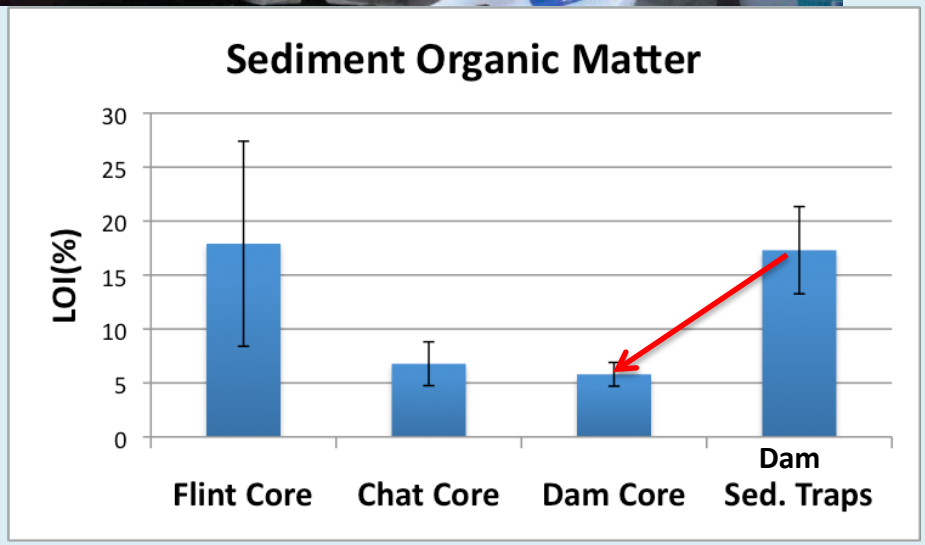


Mesocosms

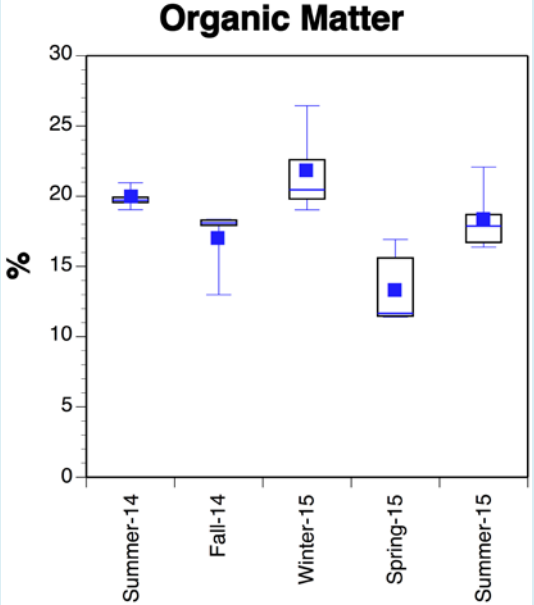
- Treatments
  - Control, Corb, Pom, Hyd
  - Corb+Hyd, Corb+Pom, Pom+Hyd
  - Hyd+Corb+Pom

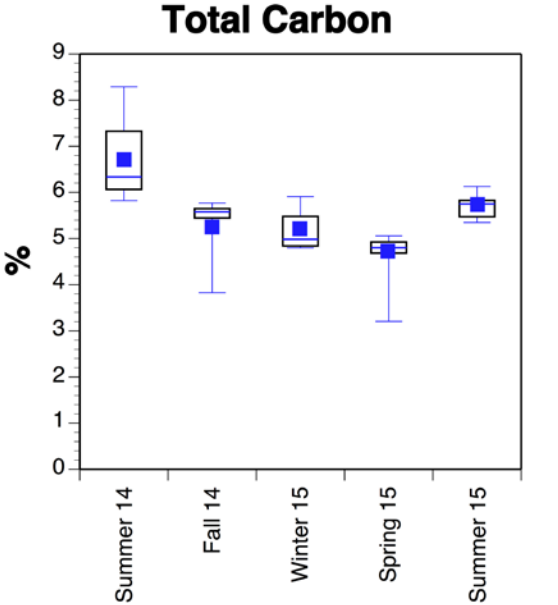
Stephen Shivers, PhD UGA

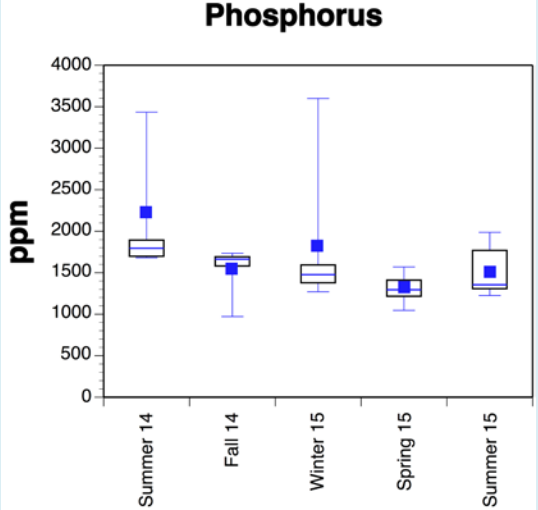
Dam Area Sediments

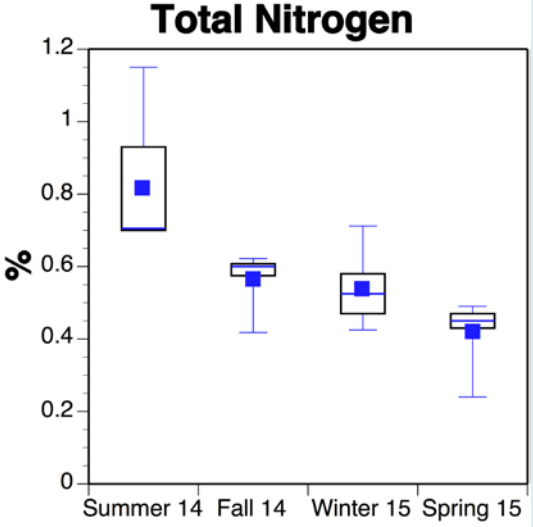


Sediment Trap Nutrients

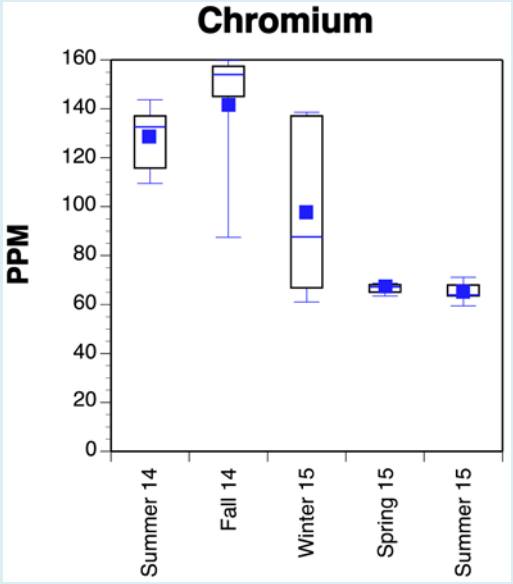


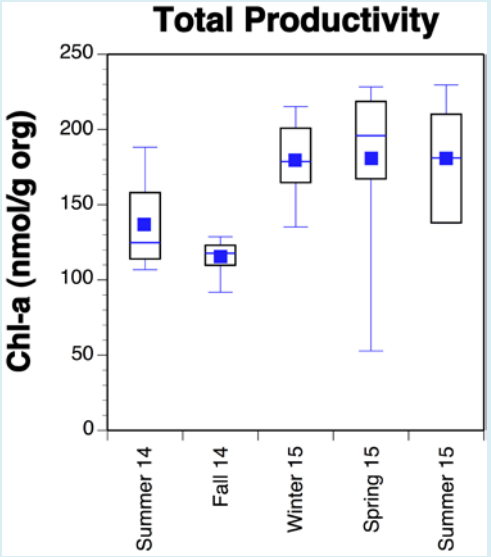


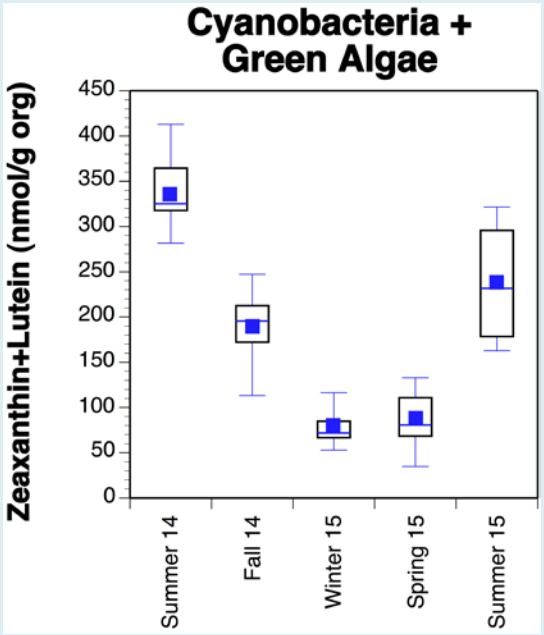


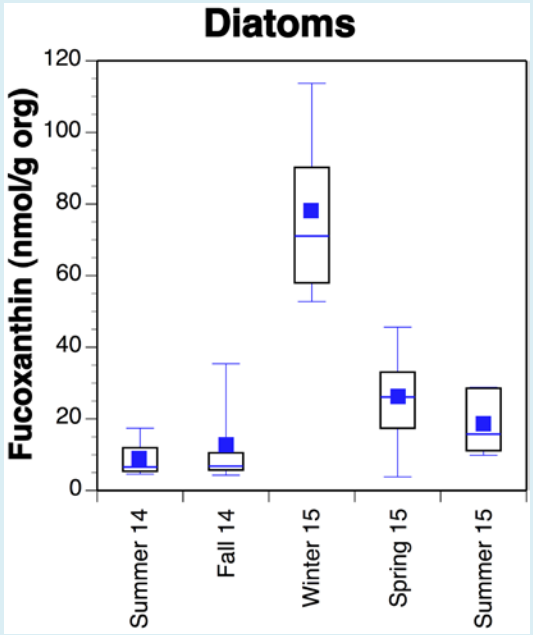


Sediment Trap Metals and Pigments



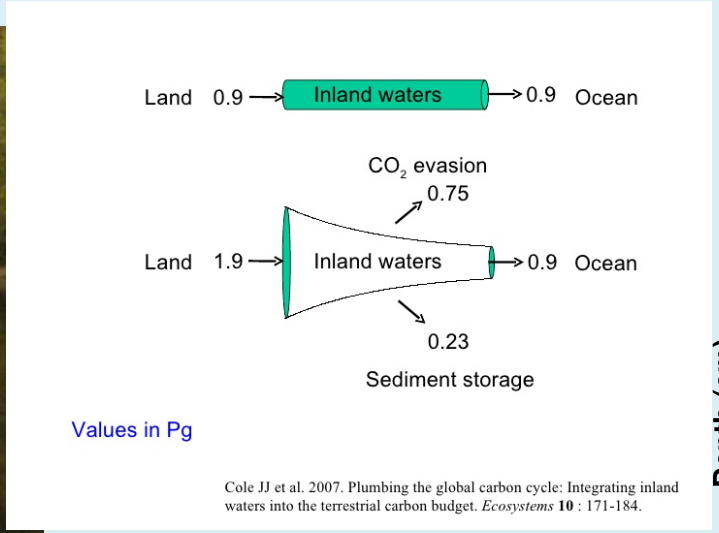




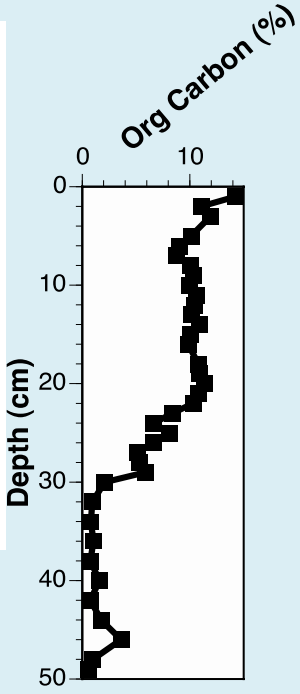


What's Next

- Drones
- eDNA
- C dynamics



Cole JJ et al. 2007. Plumbing the global carbon cycle: Integrating inland waters into the terrestrial carbon budget. *Ecosystems* **10** : 171-184.



Questions?

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