

Aquatic Invasive Plant Research at MSU

Gray Turnage, PhD

Asst. Research/Extension Professor

Mississippi State University

Geosystems Research Institute

Gturnage@gri.msstate.edu

www.gri.msstate.edu



MISSISSIPPI STATE
UNIVERSITY™

Geosystems Research Institute



Background

- Dozens of Aquatic Weeds across southeastern U.S.
 - 16 on federal noxious weed list
 - 3 on MS state noxious weed list
 - >12 exotic aquatic plants in MS; ~1/2 dozen native nuisance species in MS
- Turnage lab projects focus on the biology, ecology, and management of aquatic weeds
 - Turnage: split appt. – 60% research/40% extension
 - Projects: plant surveys, herbicide screenings, non-chemical control methods, restoration plantings, UAS detection methods of AIS, phytoremediation efforts, field herbicide applications, education and outreach initiatives, consulting with gov't agencies, etc.



MISSISSIPPI STATE
UNIVERSITY™

Geosystems Research Institute



Ongoing Research and Activities

- **Primary AIS Targets**

- Alligatorweed
- Cuban bulrush
- Hybrid eelgrass
- Cutgrass
- Knotgrass

Alligatorweed



Cuban Bulrush



Eelgrass



Cutgrass



Knotgrass



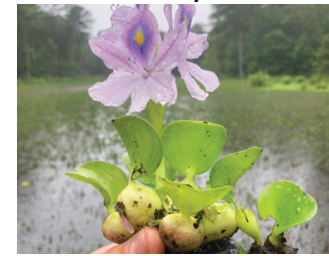
- **Secondary AIS Targets**

- Giant Salvinia
- Water hyacinth
- Mosquitofern

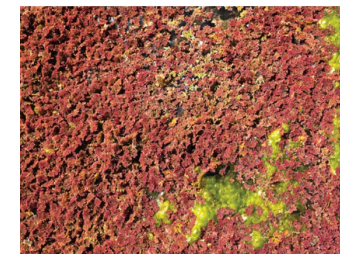
Giant Salvinia



Water Hyacinth



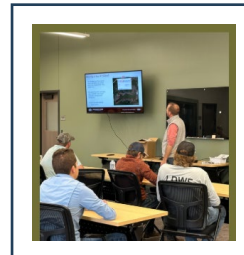
Mosquitofern



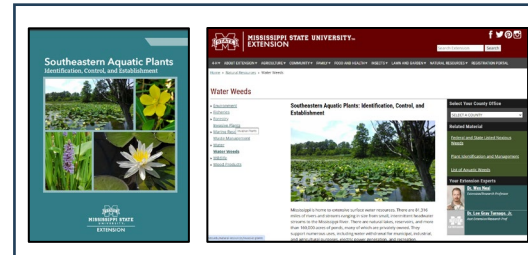
- **Ed./Outreach Programs**

- Extension Agent Training
- MSU Waterweeds (Neal and Turnage)
- MSU SEAS

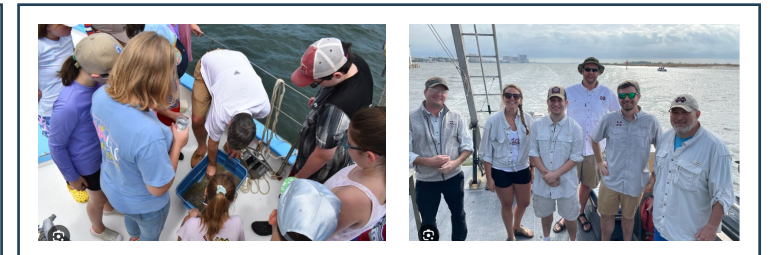
Agent Training



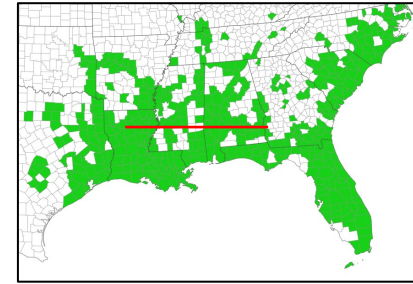
MSU Waterweeds



MSU SEAS



Primary AIS Targets



- Alligatorweed

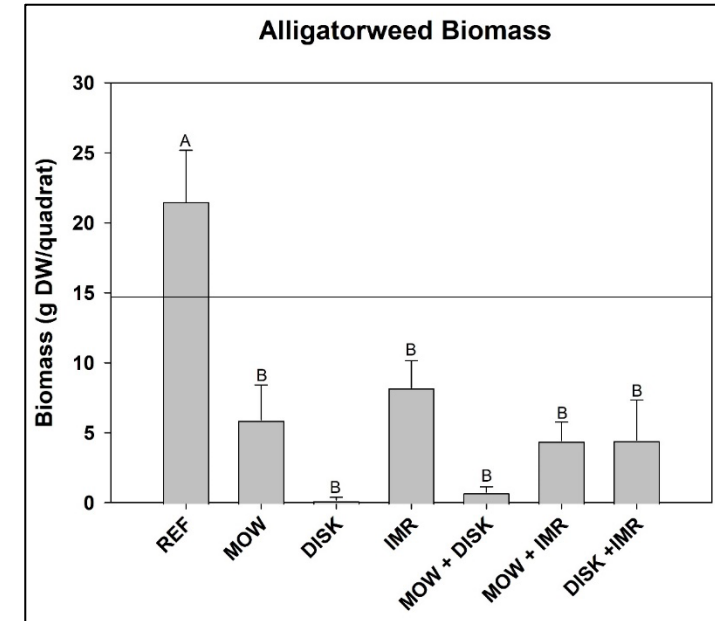
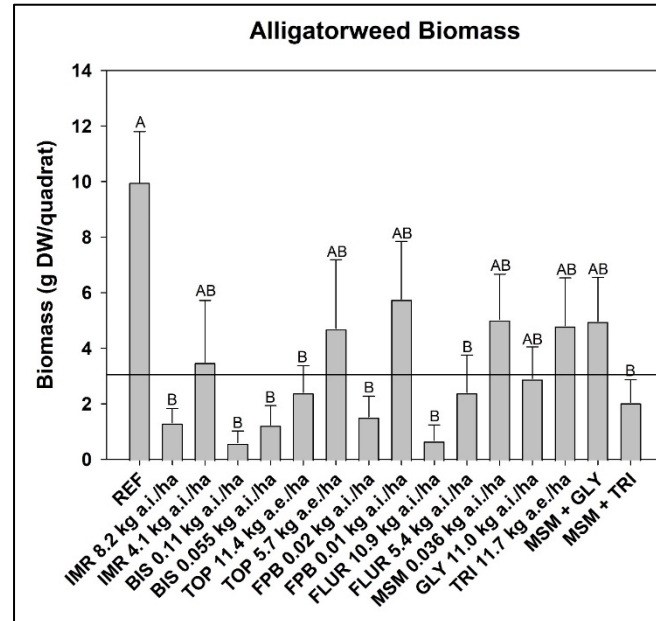
- Most common aquatic plant (native or exotic) in MS

- Contemporary management strategies don't work across entire range or deliver long term control

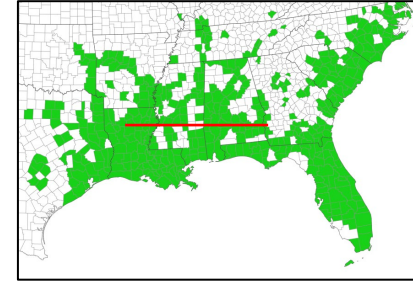
- Flea Beetle
- Imazapyr + Glyphosate

- Ongoing

- Herbicide trials
- Integrated control trials
 - Chemical + thrips



Primary AIS Targets



- Alligatorweed

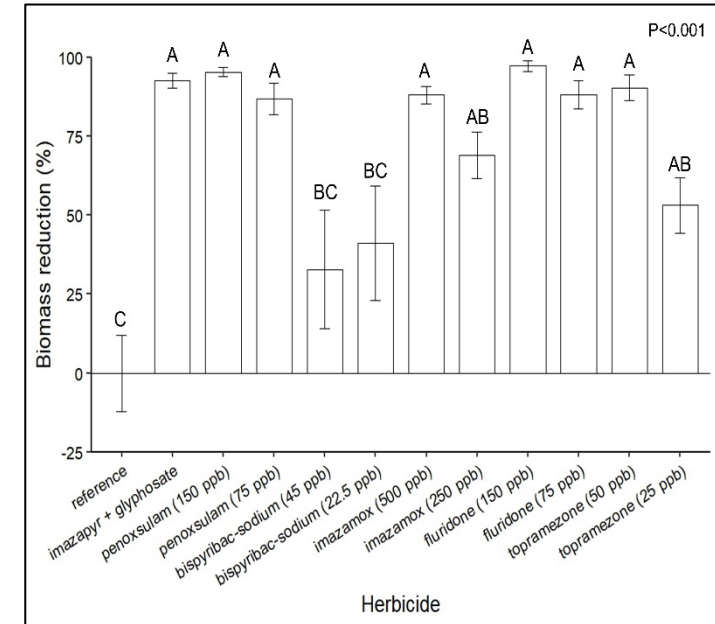
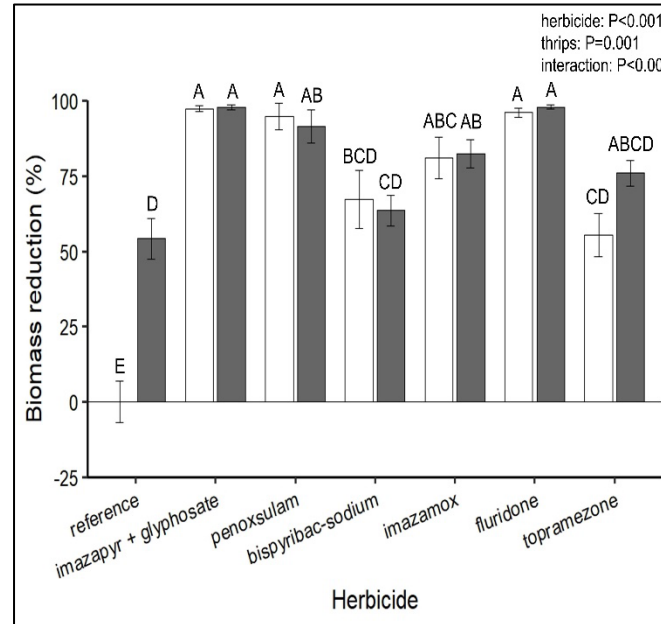
- Most common aquatic plant (native or exotic) in MS

- Contemporary management strategies don't work across entire range or deliver long term control

- Flea Beetle
- Imazapyr + Glyphosate

- Ongoing

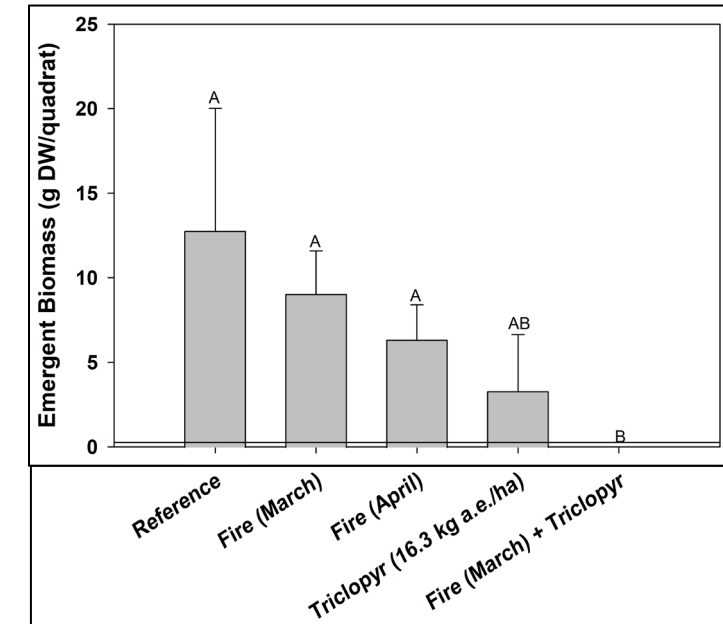
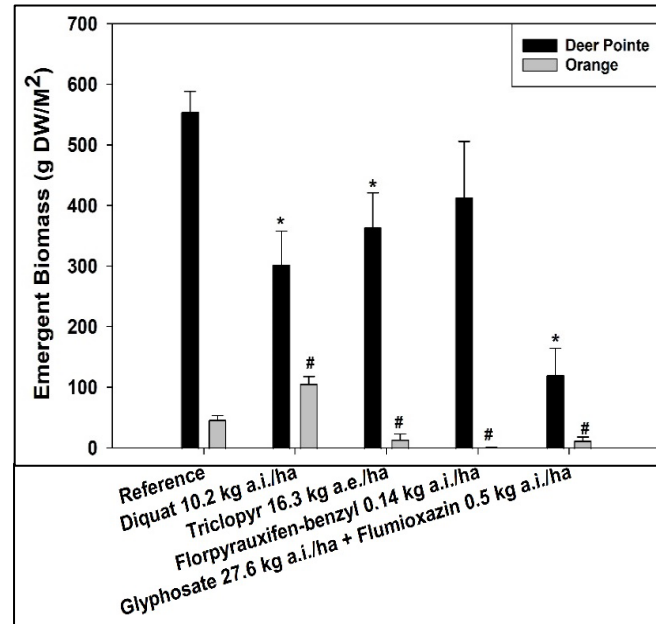
- Herbicide trials
- Integrated control trials
 - Chemical + thrips



Primary AIS Targets

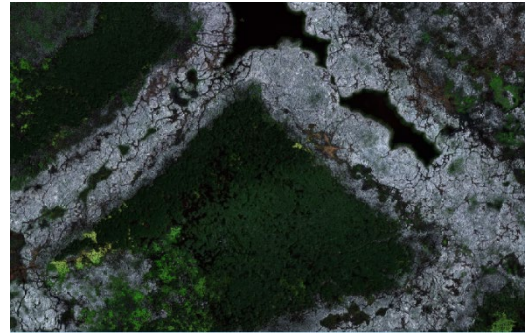


- Cuban Bulrush
 - Free Floating epiphyte
 - Forms large floating islands
 - 2 biotypes (umbellate vs. monocephalous)
- Not managed prior to ~2010
 - First peer review lit in 2014
- Ongoing Research
 - Small scale screenings
 - Field trials in MS and FL
 - Integrated control techniques
 - Chemical + Prescribed Fire

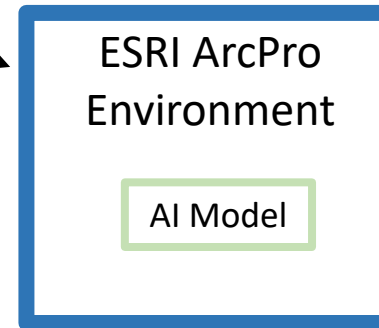


Primary AIS - UAS

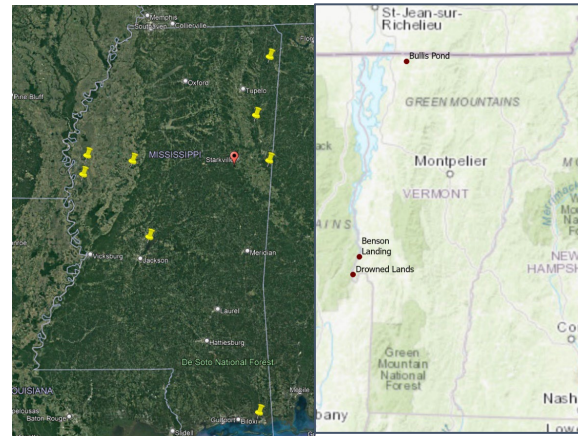
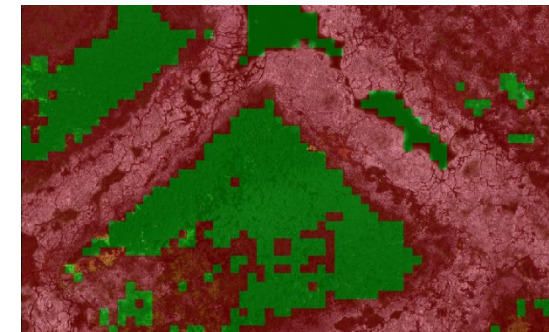
- UAS present new tool to ID AIS on landscape; however, multiple methods in literature
- Project funded by USACE ERDC EL
 - ~\$2.5M over 4 yrs (in yr. 2)
- Preliminary results found 98% accuracy differentiating Cuban bulrush from Juncus
 - Expanding to other spp.



UAS Acquired Imagery



Classification Map



Secondary AIS Targets



- **Mosquitofern**

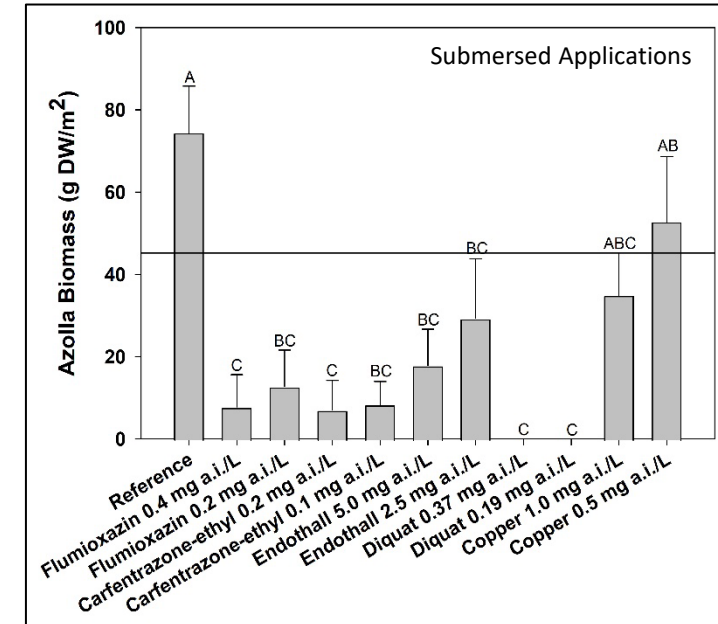
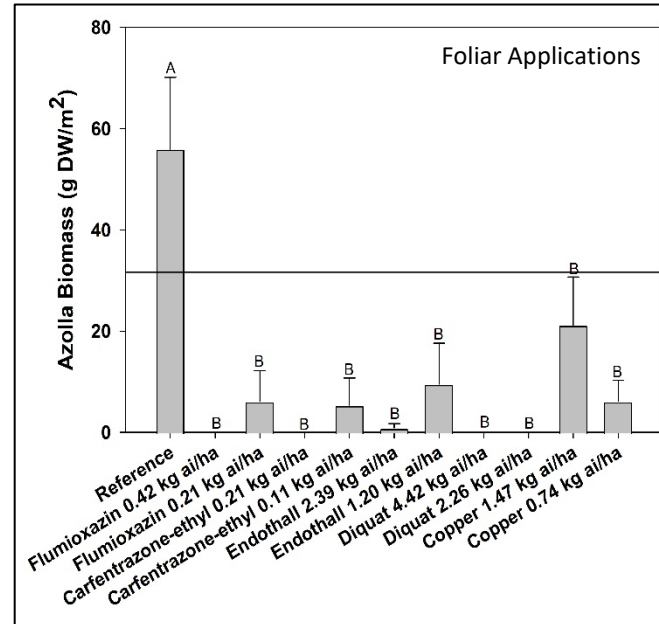
- Free Floating
- Native Nuisance
- Green or red coloration
- Invasive and native spp. in Southeastern U.S.

- **Major problem in small lentic water bodies**

- Not limited by low nutrients in water
- Literature regarding control techniques VERY limited

- **Ongoing Research**

- Small scale screenings
 - Contact vs. Systemic Herbicides
 - Foliar vs. Submersed Applications



Education/Outreach

- **Agent Training**

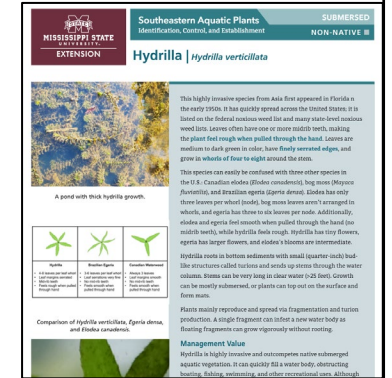
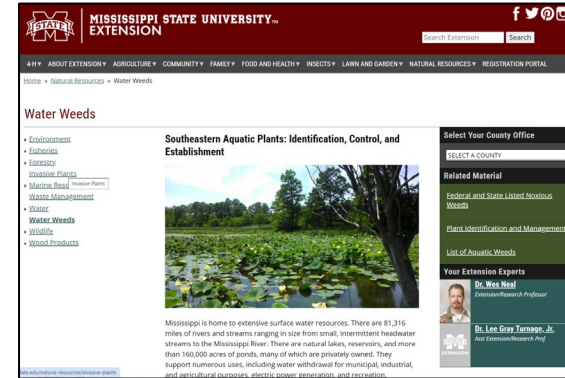
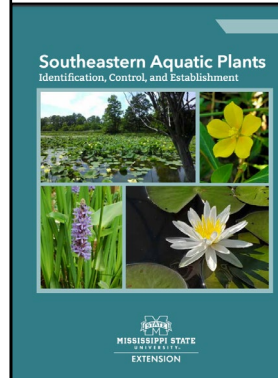
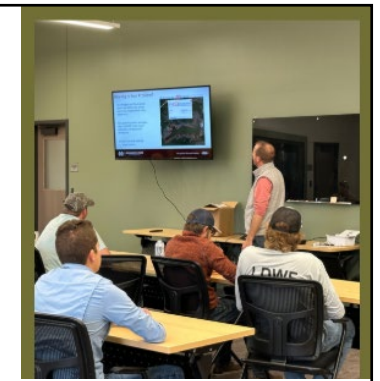
- Online Modules
- In-person events
- Workshops
- Plant ID

- **Waterweeds Website**

- Authors: Neal, Riecke, and Turnage
- On-line resource
- Factsheets
- Field Manual

- **MSU SEAS**

- 7-12 grade students
- Experiential learning event
- Focuses on marine/estuarine science



MISSISSIPPI STATE
UNIVERSITY™

Geosystems Research Institute



Questions

Gray Turnage, PhD
Assistant Res/Ext Professor
Mississippi State University
Geosystems Research Institute
Ph: 662-325-7527
E-mail: Gturnage@gri.msstate.edu

www.gri.msstate.edu



MISSISSIPPI STATE
UNIVERSITY™

Geosystems Research Institute

