

**MidSouth Aquatic Plant Management Society  
44th Annual Meeting &  
Joint Conference with Texas APMS**

**MIDSOUTH AQUATIC PLANT**



**MANAGEMENT SOCIETY**

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**PROGRAM**

**November 3 – 6, 2025  
The Arlington  
Hot Springs, Arkansas**

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Dr. John Madsen (2011)  
Sherry Whitaker (2012)  
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Craig Aguillard (2014)  
Jeremy Slade (2016)  
Friends & Families of MSAPMS Members (2017)  
Dr. Ryan Wersal (2018)  
Dr. Brett Hartis (2019)  
JJ Ferris (2020)  
Scott Jackson (2021)  
Carl Della Torre (2022)  
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A. Leon Bates (1996)  
J. Lewis Decell (1996)  
Joe Kight (1997)  
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# MidSouth APMS & Texas APMS 2025 Joint Conference Agenda

## **MONDAY, NOVEMBER 3**

- 10:00 AM – 5:00 PM            Registration Opens (Conf Center Foyer)
- 12:00 PM – 5:00 PM            Exhibit Set up (Crystal Ballroom)
- 1:00 PM – 3:00 PM             MSAPMS Board Meeting (Board Room)
- 6:00 PM – 9:00 PM             President's Welcome Reception (Crystal Ballroom)
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## **TUESDAY, NOVEMBER 4**

**7:00 AM – 8:00 AM            Breakfast Provided (Venetian Dining Room)**

**8:00 AM – 5:00 PM            Exhibit Hall Open (Crystal Ballroom)**

### **Kickoff Session – (Conference Center)**

- 8:00 AM – 8:10 AM            Opening Remarks - *Stephen Turner, TVA, MSAPM President-elect*
- 8:10 AM – 8:30 AM            Welcome - Hot Springs City and Chamber Officials
- 8:30 AM – 8:40 AM            Presidential Address - *Dr. Gray Turnage, MSU, MSAPMS President*
- 8:40 AM – 9:30 AM            Why Control Aquatic Invasive Plants? -*Dr. John Madsen, JD Madsen Consulting LLC*
- 9:30 AM – 9:50 AM            AERF Update / AERF-MSAPMS-TVA Plant Camp Update – *Carlton Layne, Aquatic Ecosystem Restoration Foundation*
- 9:50 AM – 10:00 AM           APMS Update -*Dr. Lyn Gettys, University of Florida*

**10:00 AM – 10:20 AM        Networking Break (Crystal Ballroom)**

### **Research Session 1 – (Conference Center)**

- 10:20 AM – 10:40 AM        Legislation and Status of Aquatic Noxious Weeds in the Southeast United States - *Nicholas Engle-Wrye, Mississippi State University*
- 10:40 AM – 11:00 AM        Preliminary Phenological Trends of *Vallisneria* taxa in North America - *Maxwell G. Gebhart, Mississippi State University*

# MidSouth APMS & Texas APMS 2025 Joint Conference Agenda

- 11:00 AM – 11:20 AM      Field-Scale Assessment of Juncus-Derived Biochar and Fertilizer Regimes on Soil Biophysical Properties, Sorghum Yield, and Greenhouse Gas Fluxes in Southern Texas - *Damar D. Wilson, Prairie View A&M University*
- 11:20 AM – 11:40 AM      Phytoremediation and Growth Efficiency of Perennial Plants in Simulated Aquatic Environments - *Bhupinder Singh, University of Houston*
- 11:40 AM – 12:00 PM      Evaluating AC Aqua® as a Sustainable Management Tool for *Microcystis aeruginosa* Blooms in Pond Systems - *Brittany Chesser, Texas A&M University*
- 12:00 PM – 1:00 PM      Lunch Provided (Crystal Ballroom)**
- Research Session 2 - (Conference Center)**
- 1:00 PM – 1:20 PM      Chemical Control of the Aquatic Plants Alligatorweed and Knotgrass – *Dr. Gray Turnage, Mississippi State University*
- 1:20 PM – 1:40 PM      Quantifying the Nutrient-Pollution Impacts of Aquatic Plant Management in Florida - *Anthony Dues Jr., Florida Gulf Coast University*
- 1:40 PM – 2:00 PM      Reducing Carrier Volume for Crested Floating Heart (*Nymphoides cristata*) Control - *Corrina Vuillequez, University of Florida*
- 2:00 PM – 2:20 PM      Demonstration of Novel Small Plot Treatments for Controlling Hydrilla on Lake Seminole - *Amber Riner, University of Florida*
- 2:20 PM – 2:40 PM      Aquatic Use and Select Non-Aquatic Use Herbicide Efficacy on *Vallisneria × pseudorosulata* - *Maxwell G. Gebhart, Mississippi State University*
- 2:40 PM – 3:00 PM      Aquatic Use and Select Non-Aquatic Use Herbicide Efficacy on *Vallisneria spiralis* in Mesocosms - *Nicholas Engle-Wrye, Mississippi State University*
- 3:00 PM – 3:20 PM      Networking Break (Crystal Ballroom)**

# MidSouth APMS & Texas APMS 2025 Joint Conference Agenda

## Research Session 3 – (Conference Center)

3:20 PM – 3:40 PM	Efficacy of Five Herbicides on Nuisance Bladderwort ( <i>Utricularia radiata</i> ) Under Simulated Pond Conditions - <i>Brittany Chesser, Texas A&amp;M University</i>
3:40 PM – 4:00 PM	Screening ecotypes of native Florida SAV species under common nursery conditions - <i>Dr. Lyn Gettys, University of Florida</i>
4:00 PM – 4:20 PM	From Stakeholder Surveys to Tank Trials: Managing Cuban Bulrush Across the Southeastern United States - <i>Patrick Belk, University of Florida</i>
4:20 PM – 4:40 PM	Preliminary Morphological Trends of Vallisneria in North America- <i>Maxwell G. Gebhart, Mississippi State University</i>
4:40 PM – 5:00 PM	Vegetative reproduction and productivity of crested floatingheart ( <i>Nymphoides cristata</i> ) - <i>Dr. Lyn Gettys, University of Florida</i>
<b>5:00 PM – 6:00 PM</b>	<b>MSAPMS Annual Business Meeting (Conference Center)</b>
<b>6:00 PM – 7:00 PM</b>	<b>Student Networking Event (Fountain Room)</b>
<b>7:00 PM</b>	<b>Dinner (On Your Own)</b>

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## WEDNESDAY, NOVEMBER 5

**7:00 AM – 8:00 AM**                      **Breakfast Provided (Venetian Dining Room)**

**8:00 AM – 5:00 PM**                      **Exhibit Hall Open (Crystal Ballroom)**

## **Resource Managers Session 1 – (Conference Center)**

8:00 AM – 8:20 AM	From Past Failures to Future Successes: Efforts to Establish Aquatic Vegetation in Arkansas - <i>Jeremy Risley, Arkansas GFC</i>
8:20 AM – 8:40 AM	State of Alabama Aquatic Plant Management Update - <i>Graves Lovell, Alabama DCNR</i>
8:40 AM – 9:00 AM	Giant Salvinia's Northward Expansion: An Invasive Threat in Arkansas - <i>Elizabeth Chambers, Arkansas GFC</i>

# MidSouth APMS & Texas APMS 2025 Joint Conference Agenda

9:00 AM – 9:20 AM Alabama Power Aquatic Plant Management Program Update  
*Tim McLean, Alabama Power*

9:20 AM – 9:40 AM Invasive Aquatic Plant Management in Louisiana - *Michael Coulon, Louisiana DWF*

9:40 AM – 10:00 AM Mississippi Aquatic Vegetation Management from a Resource Manager's Point of View - *Buford Lessley, Mississippi WFP*

10:00 AM – 10:20 AM **Networking Break (Crystal Ballroom)**

## **Industry Session – (Conference Center)**

**Moderator – Stephen Turner, MSAPMS President - elect**

10:20 AM – 10:40 AM Industry Updates - *Platinum and Gold Sponsors*

10:40 AM – 11:40 AM Industry Round Table Discussion

**11:40 AM – 1:00 PM Lunch (On Your Own)**

## **Resource Managers Session 2 – (Conference Center)**

**Moderator – Matt Horton, MSAPMS Director**

1:00 PM – 1:10 PM Industry Updates - *Platinum and Gold Sponsors*

1:10 PM – 1:30 PM Nutrient Management for Algae Control: Key Nutrient Thresholds Required to Prevent Bloom Formation - *Patrick Goodwin, Natural Lake Biosciences*

1:30 PM – 1:50 PM Using the Adjuvant Topfilm to Improve Herbicide Control of Invasive Aquatic Plants - *Lucia Marshall, Biosorb Inc.*

1:50 PM – 2:10 PM Toxic Waters: Understanding and Addressing Harmful Algal Blooms (HABs) - *Chase Kilgore, SePRO Corporation*

2:10 PM – 2:30 PM Comparative analysis of UAS multispectral sensor derived vegetation indices for assessing emergent aquatic plant control – *Dr. Jonathan Fleming, Samford University*

2:30 PM – 2:50 PM Using BioBase as an Aid for Lake and Pond Management *Jordan Holmes, Aquatic Control Inc.*

**2:50 PM – 3:20 PM Networking Break (Crystal Ballroom)**

# MidSouth APMS & Texas APMS 2025 Joint Conference Agenda

## **Texas APMS Session – (Conference Center)**

**Moderator – Weston Jordon, TAPMS President**

- 3:20 PM – 3:40 PM            Understanding Phenology of Invasive Aquatic Plants to Inform Management Initiatives in the United States- *Dr. Gray Turnage, Mississippi State University*
- 3:40 PM – 4:00 PM            Evaluating Liming Formulations for Water Quality Improvement and Clearing Response in Aquatic Systems - *Dr. Todd Sink, Texas A&M University*
- 4:00 PM – 4:20 PM            Storm-resilient Floating Mat Systems for aquatic Plant Growth and Wetland Restoration- *Nirmal Kumar, Prairie View A&M University*
- 4:20 PM – 4:40 PM            Ecological Benefits and Propagation Strategies of Native Aquatic Plants- *Haley Kokel - Fish On Aquatic Plant*
- 4:40 PM – 5:00 PM            Managing Golden Algae Blooms with Non-Herbicide Alternatives: A Mesocosm Evaluation of AC Aqua - *Dr. Todd Sink, Texas A&M University*
- 5:00 PM – 6:00 PM            TAPMS Business Meeting (Conference Center)**
- 6:00 PM – 9:00 PM            Awards Banquet Dinner (Venetian Dining Room)**
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## **THURSDAY, NOVEMBER 6**

**Moderator – Stephen Turner, MSAPMS President-elect**

- 7:00 AM – 8:00 AM            Breakfast Provided (Venetian Dining Room)**
- 8:00 AM – 12:00 PM           Exhibit Hall Open (Crystal Ballroom)**

### **Workshop Session 1 – (Conference Center)**

- 8:00 AM – 9:00 AM            Ecology and Life History of AIS - *Dr. John Madsen, JD Madsen Consulting LLC*
- 9:00 AM – 10:00 AM           Environmental Fate and Toxicity of Herbicides Used for Aquatic Plant Control - *Dr. Gray Turnage, Mississippi State University*
- 10:00 AM – 10:10 AM           Networking Break (Crystal Ballroom)**

# MidSouth APMS & Texas APMS 2025 Joint Conference Agenda

## **Workshop Session 2 – (Conference Center)**

- 10:10 AM – 11:10 AM      Laws and Regulations around Aquatic Plant Management -  
*Carlton Layne, AERF*
- 11:10 AM – 12:10 PM      Calibrating Aquatic Herbicide Applications to Avoid Violating  
Federal and State Law  
Dr. John Madsen, JD Madsen LLC
- 12:10 PM – 1:00 PM      Lunch Provided (Crystal Ballroom) + Exhibit Tear Down**

## **Workshop Session 3 – (Conference Center)**

- 1:00 PM – 2:00 PM      Texas Statewide IPM of Aquatic and Riparian Invasive Species-  
*John Findeisen - Texas Parks and Wildlife*
- 2:00 PM – 3:00 PM      Vegetation Management on a Large Scale Constructed Wetland  
for Water Reuse - *T. Wells Shartle - Tarrent Regional Water District*

## **2:50 PM – 3:00 PM    Networking Break (Conference Center Foyer)**

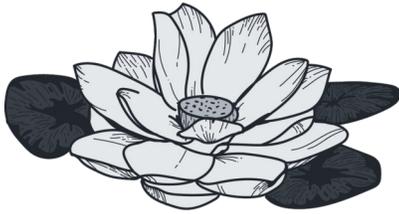
## **Workshop Session 4 – (Conference Center)**

- 3:00 PM – 4:00 PM      Comprehensive Approaches to Safety in Diverse Environments –  
*Cary Martin, Nutrien*
- 4:00 PM – 5:00 PM      Hands-on Plant ID Session - *Dr. Gray Turnage, Mississippi State  
University*
- 5:00 PM – 5:10 PM      Day 3 Concluding Remarks
- 5:30 PM – 7:30 PM      Workshop/Resource Managers Social (Crystal Ballroom)**
- 7:30 PM -                      Dinner (On Your Own)**

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## **FRIDAY, NOVEMBER 7**

7:00 AM Depart at Leisure



# MSAPMS and TAPMS



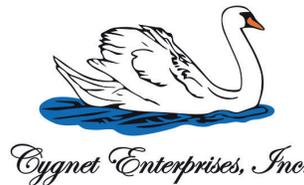
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# Session Abstracts

(In presentation order)

**Tuesday, November 4, 2025**

## **Keynote**

### **Why Control Aquatic Invasive Plants?**

***Dr. John Madsen, JD Madsen Consulting LLC***

The reasons to manage aquatic invasive plants are often obvious or irrelevant to those wanting the management performed, but cogent justifications for management of these species are readily available to justify these actions. An invasive species is defined as a nonnative species that causes ecological, economic, or aesthetic harm. Management might be done for any or all of these reasons. I will review these issues and the potential to reverse the harm that invasive aquatic plants cause.

## **Research Session 1**

### **Legislation and Status of Aquatic Noxious Weeds in the Southeast United States**

***Joey Kauppi and Gray Turnage (Presented by Nicholas Engle-Wrye), Mississippi State University***

Aquatic invasive plants (ANS) can negatively affect water chemistry, disrupt ecological processes, lower biodiversity, and impact human uses of water resources. Because of their ability to rapidly colonize new habitat, many states and the federal government have placed invasive aquatic plants on noxious weed lists with the aim of reducing their spread. The states of the southeastern U.S. (TX, LA, MS, AL, FL, GA, SC, TN, AR, and KY) have dozens of invasive aquatic plants but only a few are listed as noxious weeds. Many states have varying definitions and classes of noxious weeds thus complicating efforts to control the spread of these species across state lines. This project aims to describe and combine the current legislation regarding noxious weeds in each state of the southeastern U.S. into a factsheet in an effort to provide resource managers and stakeholders a common resource to help slow the spread of these problematic species

### **Preliminary Phenological Trends of *Vallisneria taxa* in North America**

***Maxwell G. Gebhart, Mississippi State University***

*Vallisneria* is a genus of submersed macrophytes part of the Hydrocharitaceae family which several species have been introduced and become invasive in North America. Previous research on the genus has been confounded by numerous taxonomic changes, warranting research into life history and phenological trends for the taxa in North America. *Vallisneria americana*, *V. neotropicalis*, *V. × pseudorosulata*, *V. spiralis*, and *V. australis* are all being grown as separate monocultures in mesocosms for one year. Environmental measures such as temperature, photoperiod, and water quality are being continuously monitored. Once a month, 30 samples are harvested per species and separated into aboveground and belowground tissues. Additionally, ramet and flower density are recorded, then tissues are put into paper bags and dried with a forced air-drying oven for 72 hours. Once dried, tissue weight is recorded and converted to g DW/m<sup>2</sup>. Current trends show invasive taxa: *V. × pseudorosulata*, *V. spiralis*, *V. australis*, growing much larger and reproducing faster than the native taxa, *V. americana* and

*V. neotropicalis*. *Vallisneria* × *pseudorosulata* shows reproduction occurring at a larger scale than other invasive taxa achieving a current maximum of 2,478 ramets per m<sup>2</sup>. Once completed, this information will be used to inform management timing for invasive *Vallisneria* taxa to reduce population density and biomass production. This study will finish January 2026 leading to several follow up studies on carbohydrate extraction and field verification of phenological trends.

### **Field-Scale Assessment of Juncus-Derived Biochar and Fertilizer Regimes on Soil Biophysical Properties Sorghum Yield, and Greenhouse Gas Fluxes in Southern Texas**

***Damar D. Wilson, Prairie View A&M University***

This study evaluated the effects of biochar and chemical fertilizer, applied individually or in combination, on sorghum biomass, grain yield, and greenhouse gas (GHG) emissions in a field trial conducted in Southern Texas. Treatments were applied using the banding method (5 cm lateral, 5 cm depth) and included full, half, and double recommended fertilizer rates with or without biochar, alongside a control. Across treatments, greenhouse gas fluxes (N<sub>2</sub>O, CH<sub>4</sub>, CO<sub>2</sub>) exhibited distinct responses to soil parameters such as temperature, moisture, and electrical conductivity, highlighting complex interactions between nutrient inputs, soil conditions, and gas dynamics. ANOVA results showed significant differences in stem and root biomass, grain yield, and plant height. Among treatments, B/C REC (biochar + recommended fertilizer) achieved consistently high biomass, soil moisture content, and yield while maintaining balanced soil conditions, whereas B/C-D/R (biochar + double fertilizer) produced the highest yield but also elevated CO<sub>2</sub> and N<sub>2</sub>O emissions. C-D/R (full fertilizer) promoted strong vegetative growth but with reduced soil moisture retention compared to biochar-amended treatments. C/REC emerged as the most sustainable treatment, balancing yield performance with lower GHG emissions.

These findings suggest that *Juncus*-derived biochar, when applied in conjunction with recommended fertilizer levels, has strong potential to improve soil health and sustain crop productivity while minimizing greenhouse gas impacts. The results highlight the importance of integrating aquatic-plant-derived biochar into agroecosystem management strategies to advance climate-smart agriculture.

### **Phytoremediation and Growth Efficiency of Perennial Plants in Simulated Aquatic Environments**

***Bhupinder Singh, University of Houston***

Aquatic ecosystems face growing risks from nutrient and heavy metal pollution. Phytoremediation with perennial aquatic plants offers a sustainable and effective way to address these issues, as these plants thrive year-round and support beneficial microbial interactions. This study investigates the nutrient removal efficiency and growth performance of twelve perennial aquatic plant species, evaluated under monoculture and mixed culture conditions in simulated aquatic environments. The experiment used 7-gallon buckets filled with tap water and 0.3 g/L soluble nutrients to simulate wastewater. Twelve monoculture and mixed-culture buckets were set up, along with a control containing only water and fertilizer. Every two weeks, TN, TP, DO, pH, and microbial load were measured. Preliminary findings focused on TN, TP (using Ion Chromatography), and DO dynamics. Mixed cultures can foster more diverse and functionally complementary microbial communities by combining different root structures and exudates, which in turn enhances nutrient cycling and removal efficiency compared to single-species systems.

In monoculture systems, Gulf dune paspalum (*Paspalum monostachyum*) showed the highest nitrogen removal (residual TN: 41.2–42.7 mg/L), whereas Slimpod rush (*Juncus diffusissimus*) retained more nitrogen (~49 mg/L), indicating lower efficiency. Soft rush (*Juncus effusus*) removed over 90% of total

phosphorus (TP), leaving only 6–7 mg/L, while Gulfdune paspalum was less effective, with ~62 mg/L residual phosphorus. Soft rush, Ravenfoot sedge, Slimpod rush, and Roundhead rush also consistently increased dissolved oxygen above 20 mg/L. Mixed culture systems were more effective than monocultures in removing nitrogen and phosphorus. Torrey’s rush and Gulfdune paspalum achieved about 69% TN and 70% TP removal (TN: ~19 mg/L; TP: ~28–29 mg/L). Arrowhead + Ravenfoot sedge and Ravenfoot sedge + Dixie iris also reduced TN by approximately 60–61%. Mixed cultures showed consistently higher DO levels, indicating better oxygen transfer and microbial activity. Pairing strong oxygen-releasing species with moderate ones boosts nutrient removal efficiency. The ongoing experiment shows that mixed perennial plantings in FTW systems enhance nutrient removal and oxygenation, providing a more sustainable solution for urban wastewater than monocultures.

### **Evaluating AC Aqua® as a Sustainable Management Tool for *Microcystis aeruginosa* Blooms in Pond Systems**

***Brittany Chesser, Texas A&M University***

Harmful algal blooms (HABs) caused by *Microcystis aeruginosa* (cyanobacteria) present substantial ecological, economic, and public health concerns across the United States. These blooms can lead to fish kills, livestock and pet deaths, degraded water quality, and disruptions in aquaculture and agriculture. Conventional management strategies such as nutrient buffers, chemical algaecides, dilution, and oxidation are often expensive, logistically challenging, or damaging to non-target organisms. As a result, there is increasing interest in sustainable alternatives. This study evaluated the use of AC Aqua, a proprietary humic acid-based water treatment, as a potential management strategy for *M. aeruginosa*. Humic acids are naturally derived organic compounds that can promote phosphorus cycling by beneficial bacteria and directly bind free phosphorus. Replicated outdoor mesocosm trials were conducted using multiple application rates (prophylactic, low, and high), with and without pond sediment present. Within six hours of treatment, significant phosphorus reductions were observed, especially in systems containing sediment. Prophylactic treatments effectively limited algal proliferation, maintaining cell densities below bloom thresholds and significantly reducing *M. aeruginosa* abundance by week four. These results suggest that AC Aqua may provide a sustainable, cost-effective approach to managing *M. aeruginosa* blooms by enhancing nutrient sequestration and limiting algal growth.

## **Research Session 2**

### **Chemical Control of the Aquatic Plants Alligatorweed and Knotgrass**

***Dr. Gray Turnage, Mississippi State University***

Alligatorweed (*Alternanthera philoxeroides*) and knotgrass (*Paspalum distichum*) are two widespread aquatic weeds in Mississippi. Both can survive stressors such as drawdown or drought, and biocontrol agents provide varying levels (alligatorweed) or no reduction (knotgrass) depending on species and geographic location. Some data exist regarding chemical control of each species, but newer herbicides are commercially available that have not been evaluated against either species. In 2022, initial foliar herbicide screening for operational control of alligatorweed found that imazapyr, bispyribac-sodium, topramezone, and florypyrauxifen-benzyl reduced plant biomass 74 to 84% one year after treatment. A second trial initiated in 2023, found that tank mixtures generally provided greater alligatorweed reduction (>90% biomass reduction) than single herbicide applications. Initial knotgrass treatments found that glyphosate, imazamox, imazapyr, and penoxsulam all reduced knotgrass one year after treatment when applied at the maximum label rate. A second knotgrass trial (2023) found that all year 1 herbicides except imazamox could be reduced 50% and still provide greater than 77% biomass reduction one year after treatment. All herbicide applications included a 0.5% v:v MSO surfactant and were applied at a 467.7 L/ha (50 gal/ac)

diluent rate. This work provides multiple control techniques for each species so that resource managers have a multitude of treatment options to select among for budgeting and herbicide stewardship purposes.

### **Quantifying the Nutrient-Pollution Impacts of Aquatic Plant Management in Florida**

*Anthony Dues Jr., Florida Gulf Coast University*

The Florida Fish and Wildlife Conservation Commission (FWC) manages invasive and nuisance aquatic plants in Florida waterways through extensive use of herbicides. This practice has raised concerns among anglers and environmentalists about herbicide impacts on non-target species, concerns about the contribution of decaying plant matter to eutrophication and harmful algal blooms, reductions in water quality, and impacts on human health and recreational activities. FWC keeps detailed records of amounts of each type of herbicide applied to each plant species treated in each Florida water body it manages, as required by the US Environmental Protection Agency (EPA). This makes it possible to estimate the amount of nutrients released after herbicide treatment through a tool we have developed. We hope this tool will help managers better balance habitat management and water quality concerns.

### **Reducing Carrier Volume for Crested Floating Heart (*Nymphoides cristata*) Control**

*Corrina Vuillequez, University of Florida*

Crested floating heart (*Nymphoides cristata*, CFH) is an invasive aquatic plant in the southeastern United States. It spreads primarily through asexual reproduction via ramets, which have been reported to rapidly re-grow post-management actions. Stress induced by mechanical or chemical management may inadvertently stimulate ramet production and hinder long-term control efforts. Additionally, little is known regarding the impact of management on CFH ramet production. Therefore, a mesocosm study was conducted to evaluate CFH response to three management approaches: mechanical removal, a slow-acting herbicide treatment (glyphosate), and fast-acting herbicide treatment (diquat).

Each management type had eight replicates: four were harvested six weeks after treatment (WAT) while the remaining four were harvested 12 WAT. Visual ratings of leaf coverage (%) were conducted weekly to assess efficacy over time. At harvest, ramets were counted and biomass was dried and weighed. Biomass and ramet reduction (%) were calculated, and data was subjected to ANOVA ( $\alpha=0.05$ ) and mean separation using Fisher's Protected LSD Test.

At 6 WAT, reductions in ramets were observed across all treatments. Glyphosate had the greatest impact, reducing biomass and ramets through 12 WAT. Mechanical treatment produced moderate reductions by 6 WAT, but regrowth nullified effects by 12 WAT. Diquat caused initial injury by 2 WAT, but plants quickly recovered. No treatment triggered an increase in ramet production, suggesting that stress from sublethal control efforts does not exacerbate reproduction in CFH. These results highlight CFH's resilience and rapid regrowth capabilities, underscoring the need for sustained, long-term management strategies for effective control.

### **Demonstration of Novel Small Plot Treatments for Controlling Hydrilla on Lake Seminole**

*Amber Riner, University of Florida*

Lake Seminole, a 37,500-acre reservoir spanning Florida, Georgia, and Alabama, was created in 1958 after the construction of the Jim Woodruff Dam, where the Flint, Chattahoochee, and Apalachicola rivers converge. Similar to many other lakes across the southeastern United States, Lake Seminole is infested with *hydrilla verticillata*, an aggressively growing submerged aquatic invasive plant from Asia. Hydrilla has caused serious water resource issues on the lake such as impeding navigation, water quality

degradation, outcompeting native wildlife, and obstructing hydropower production. Currently in the southeast there is minimal rotation of hydrilla treatments, and management goals do not match concentration exposure times and selectivity profiles of single active ingredients. Therefore, the aim of this study was to evaluate herbicide novel herbicide combinations for hydrilla control in small plots to extend hydrilla suppression. Four treatment sites along the Florida and Georgia border of Lake Seminole ranging from 8 to 64 acres were treated with either endothall (2ppm) and forpyrauxifen benzyl SC (2 PDU), endothall (2ppm) and penoxsulam (25ppb), forpyrauxifen-benzyl SC (2 PDU) and imazamox (200 ppb), and 3 bump treatments spaced 1 month apart of forpyrauxifen-benzyl (2 PDU) in the spring. Point intercept aquatic plant surveys were conducted for nine months after treatment (MAT). Sites treated with combinations of endothall and forpyrauxifen-benzyl or endothall and penoxsulam exhibited an initial reduction of hydrilla followed by an increase beyond pre-treatment levels 4 MAT. The sites treated with the forpyrauxifen-benzyl and imazamox combination or forpyrauxifen-benzyl bump treatment exhibited decreasing hydrilla abundance until the end of the study. Additional monitoring will occur in the Spring to document potential regrowth.

**Aquatic Use and Select Non-Aquatic Use Herbicide Efficacy on *Vallisneria × pseudorosulata***  
*Maxwell G. Gebhart, Mississippi State University*

Submersed macrophytes such as *Vallisneria* fulfill critical roles in their native ecosystems and provide important forage and shelter for a variety of organisms. However, *Vallisneria × pseudorosulata* is a recent, aggressive invader of waterbodies in the southeast U.S., with little known about the management of this eelgrass hybrid. Therefore, mesocosm studies were conducted to assess the herbicide efficacy of 13 herbicides labelled for aquatic use and 14 herbicides not labelled for aquatic use. Plant biomass and ramet density were collected at 6 and 12 weeks after treatment (WAT). Data were analyzed using a generalized linear model with a post-hoc Tukey's Honest sum of differences test at the  $\alpha = 0.05$  significance level. Of the 27 tested herbicides, PPO, STPP, and ALS inhibiting herbicides effectively reduced above and belowground biomass and ramet density at 12 WAT. These results suggest several effective chemistries for use in *V. × pseudorosulata* management and their efficacy will be studied further in long-term concentration exposure time trials; however, some will require 24c labelling prior to availability for operational use.

**Aquatic Use and Select Non-Aquatic Use Herbicide Efficacy on *Vallisneria spiralis* in Mesocosms**  
*Nicholas Engle-Wrye, Mississippi State University*

*Vallisneria* is a genus of submersed macrophytes with several species that have become invasive in the U.S. potentially due to aquaria dumping. In Florida, *V. spiralis* is an introduced species of *Vallisneria* that has become problematic in large waterbodies such as the Braden River. Due to major taxonomic revisions, previous research on *V. spiralis* management is lacking, leading to the necessity of chemical management research. Mesocosm studies were used to assess the herbicide efficacy of 13 herbicides labelled for aquatic use and 14 herbicides with potential for a special local needs label. Plants were allowed to acclimate for two weeks in mesocosms then, pre-treatment specimens were collected, separated into aboveground and belowground tissue, and ramet densities were recorded. Plant tissues were then left to dry in a forced air-drying oven for 72 hours at 80° C, then biomass and ramet density was recorded and converted into a per square meter basis. Once treatments were dispensed, collections were done at 6 and 12 WAT and treated in a similar manner to the pre-treatment specimens. The collected biomasses and ramet densities were analyzed using a generalized linear model with a post-hoc Fisher's least sum of differences both at  $\alpha = 0.05$ . Overall, contact herbicides were found to be less effective at reducing target tissues with *V. spiralis*; however, systemic herbicides that utilize STPP and ALS inhibition reduce biomass dramatically at 12

WAT. These results suggest *V. spiralis* may need different considerations for management with effective chemistries to be studied further in a long-term concentration exposure time trials.

### **Research Session 3**

#### **Efficacy of Five Herbicides on Nuisance Bladderwort (*Utricularia radiata*) Under Simulated Pond Conditions**

***Brittany Chesser, Texas A&M University***

Bladderworts (*Utricularia* spp.) are a diverse group of carnivorous plants characterized by specialized bladder-like traps (utricles) used to capture microorganisms. Of the more than 240 species globally, approximately 16% inhabit aquatic environments where they are typically free-floating or loosely anchored by rhizoids. Although bladderworts contribute to ecosystem function and biodiversity, some species can become invasive or problematic. For example, *Utricularia radiata*, a native species in East Texas, can form dense surface mats in ponds and lakes, impeding recreation, suppressing native macrophyte diversity, and altering fish and invertebrate habitats. While previous studies demonstrated effective control of bladderwort with fluridone, its high cost, extended contact time, lack of selectivity, and prolonged water-use restrictions reduce its practicality for private and small-scale managers. Additionally, bladderworts reproduce via both seeds and fragmentation, complicating control efforts and increasing the likelihood of regrowth. This study evaluates the efficacy of five alternative herbicides (2,4-D acid, triclopyr amine, triclopyr acid, diquat, and flumioxazin) under controlled outdoor mesocosm conditions to identify more practical management strategies for nuisance *U. radiata* populations. Although focused on a problematic native species, this research may also inform broader efforts to refine selective management strategies and minimize impacts to non-target bladderwort species worldwide.

#### **Screening ecotypes of native Florida SAV species under common nursery conditions**

***Dr. Lyn Gettys, University of Florida***

Native SAV species play important roles in the aquatic ecosystem by providing structure, substrate stabilization, a food source, and numerous other environmental benefits. This presentation will describe common nursery experiments conducted on six ecotypes of Illinois pondweed (*Potamogeton illinoensis*) and seven ecotypes of native eelgrass (*Vallisneria neotropicalis*) and how the results may be useful for resource managers that are planning aquatic habitat restoration and enhancement projects.

#### **From Stakeholder Surveys to Tank Trials: Managing Cuban Bulrush Across the Southeastern United States**

***Patrick Belk, University of Florida***

Cuban bulrush (*Cyperus blepharoleptos*) is an epiphytic aquatic sedge with two distinct biotypes that have invaded the Southeastern United States and risen to a high management priority in the last decade. A survey was conducted of 132 aquatic management stakeholders from across the Southeast to collect, compile, and evaluate current management practices and information about Cuban bulrush biology and ecology. One goal of the survey was to parse out any differences between the two biotypes, but more than half (55%) of the survey respondents were unaware of which type was present in their region. The survey was followed by mesocosm studies of two of the most used herbicides (diquat and 2,4-D) for Cuban bulrush treatment. Ramets from both biotypes were propagated on floating rafts in 20-gal mesocosms from a standardized weight of cuttings in the spring of 2025. After 60 days of growth, plants were treated using a handheld, single-nozzle sprayer. Post-treatment injury ratings were significantly different between

treatments from two weeks onward, with 2,4-D alone underperforming both treatments with diquat. At six weeks post-treatment, injury declined for all units treated with 2,4-D alone as new growth emerged. Most notably, biotype had a significant effect on herbicide injury, particularly for 2,4-D. The poly biotype showed significantly less injury from 2,4-D alone as compared to the mono biotype. These results call into question the efficacy of 2,4-D as a viable treatment option for Cuban bulrush and suggest metabolic differences between the two biotypes, which will require further investigation.

**Preliminary Morphological Trends of Vallisneria in North America**  
*Maxwell G. Gebhart, Mississippi State University*

Today's aquatic herbicides can be classified by many characteristics including their absorption characteristics, mode of activity and selectivity. These characteristics along with different herbicide formulations, application techniques and/or adjuvant types can limit or manage the effects of environmental factors on herbicide treatment efficacy. As with all pesticide applications, safety is paramount, but especially when they are applied in the aquatic environment. Not only do we need to understand the types of toxicity, exposure pathways and PPE for the applicators and handlers. We also need to have an understanding of the environmental and public health concerns surrounding these materials and their use in the aquatic environment.

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**WEDNESDAY, NOVEMBER 5, 2025**

**Resource Managers Session 1**

**From Past Failures to Future Successes: Efforts to Establish Aquatic Vegetation in Arkansas**  
*Jeremy Risley, Arkansas Game and Fish Commission*

Black bass anglers in Arkansas have long advocated for establishing aquatic vegetation in reservoirs with minimal macrophyte coverage to improve black bass populations in those systems. Despite facing various challenges along the way, the Arkansas Game and Fish Commission has remained dedicated to fulfilling these anglers' requests by introducing or restoring aquatic vegetation in those reservoirs. In the early 2000s, the AGFC tried introducing submerged aquatic vegetation in Bull Shoals Lake, a 19,504-hectare reservoir in north-central Arkansas. The approach involved planting vegetation in the substrate and protecting it with exclusion cages. Unfortunately, this endeavor was impeded by water fluctuations greater than 10 meters and turtle herbivory, which hindered the successful establishment of the vegetation. However, this failure led to potential successes. In the following years, the AGFC faced another vegetation-related challenge at DeGray Lake, a 5,585-hectare reservoir in west-central Arkansas. A decline in vegetation led to a noticeable reduction in the black bass population. This time, AGFC biologists took a different approach and created floating enclosures known as "Arkansas Floating Cubes" to aid in the spread of aquatic vegetation via wind and wave action and impeding herbivory. The deployment of these structures aided in the increase in vegetation density and subsequently improved the black bass populations over time. Encouraged by this success, the AGFC has expanded the use of the Arkansas Floating Cubes to two other highland reservoirs, Beaver and Greers Ferry Lakes, aiming to replicate the positive outcomes observed in DeGray Lake. The AGFC remains dedicated to employing innovative methods to establish or restore aquatic vegetation in reservoirs with little or no macrophyte coverage, ultimately benefiting sport fish populations like black bass and enhancing angler satisfaction in Arkansas.

## **State of Alabama Aquatic Plant Management Update** *Graves Lovell, Alabama DCNR*

This will be an overview of Alabama's aquatic plant management program status.

## **Giant Salvinia's Northward Expansion: An Invasive Threat in Arkansas** *Elizabeth Chambers, Arkansas Game and Fish Commission*

Giant salvinia (*Salvinia molesta*) is an invasive floating aquatic fern native to South America. This plant forms large monoculture mats and can double its biomass in a matter of days, leading to exponential growth in infested waterways. These mats not only impede recreational activities like angling, hunting, and boating but also cause water quality issues. Well-established throughout much of Louisiana and parts of eastern Texas, giant salvinia began its northward invasion into Arkansas in 2017 at Smith Park Lake. Since then, it has spread to five additional waterbodies: Lake Erling (2018), Lake Columbia (2019), Millwood Lake (2020), Mercer Bayou (2022), and Clear Lake (2024). The Arkansas Game and Fish Commission (AGFC) and its partners have successfully contained and eradicated giant salvinia in all but Lake Erling and Lake Columbia, where invasions were more widespread. AGFC has employed various control and containment measures, including herbicide applications, containment booming, drawdowns, lake draining, cleaning stations, and manual removal. Additionally, recent climatic conditions, with extended freezing periods in winter followed by spring flooding, have been unfavorable for giant salvinia, leading to decreased densities. However, milder future winters in south Arkansas would likely lead to a dramatic increase in densities, escalating impacts on infested lakes and raising the risk of spread to nearby waterbodies.

## **Alabama Power Aquatic Plant Management Program Update** *Tim McLean, Alabama Power*

This will be a general update and overview of our program and what APC's aquatic plant management team has been up to for the 2025 season. We will talk about the ongoing battle we are having with invasive plants on our system. We will give an overview of the granular application system.

## **Invasive Aquatic Plant Management in Louisiana** *Michael Coulon, Louisiana Department of Wildlife and Fisheries*

LDWF's Aquatic Plant Control division manages nuisance aquatic vegetation throughout public waterways in Louisiana for the sake of boating access and aquatic habitat management. This presentation will consist of a general update of LDWF's aquatic plant control efforts over the recent past and near future. We will also address the use of new tools by APC staff, efforts to increase inter-agency management in Louisiana, and future concerns to monitor.

## **Mississippi Aquatic Vegetation Management from a Resource Manager's Point of View** *Buford Lessley, Mississippi Department of Wildlife, Fisheries, and Parks*

Much like other state agencies across the Southeast and Texas, the Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) continues to battle the onslaught of aquatic invasive species with a variety of techniques. The Fisheries Bureau is responsible for aquatic vegetation management on public waters and state-owned properties which consist of approximately 225,000 acres. Primary management focuses include controlling exotics, maintaining access, educating the public, and promoting native species. Problematic species managed include the giant salvinia in the Pearl River Watershed and Tenn-Tom

Waterway, Eurasian watermilfoil on Spring Lake, and water hyacinth throughout the Delta. In addition to conducting vegetation treatments across the state, fisheries staff provide technical guidance related to aquatic vegetation management to private landowners and government agencies.

## **Research Session 2**

### **Nutrient Management for Algae Control: Key Nutrient Thresholds Required to Prevent Bloom Formation**

*Patrick Goodwin, Natural Lake Biosciences*

Nutrient management is fundamental for safeguarding aquatic ecosystems and preventing harmful algal blooms (HABs), which pose risks to water quality, biodiversity, and human health. Excessive nitrogen (N) and phosphorus (P) inputs from agricultural runoff, urban stormwater, and wastewater discharges drive eutrophication, fueling algal proliferation, oxygen depletion, and, in some cases, the production of harmful toxins. Effective control of algal blooms relies on establishing nutrient thresholds that define safe concentrations of N and P in both water and sediment. In freshwater systems, water-column phosphorus levels are often targeted between 0.02 and 0.1 mg/L, while nitrogen levels are typically kept below 0.5 to 1.5 mg/L to suppress bloom formation. Importantly, sediments act as internal nutrient sources, potentially releasing phosphorus back into the water column even after external inputs are curtailed. A sediment phosphorus threshold of 50 mg/kg is increasingly recognized as a critical benchmark to minimize this internal loading risk.

Nutrient modeling plays a pivotal role in informing these management strategies by simulating nutrient transport, transformation, and interactions within watersheds, water columns, and sediments. Models such as the Lake Loading Response Model (LLRM) enable practitioners to predict nutrient loading under various land-use scenarios, climatic conditions, and management interventions. These tools support the development of Total Maximum Daily Loads (TMDLs), prioritize mitigation efforts, and help quantify uncertainties, guiding adaptive management and resource allocation.

This presentation will explore the nutrient thresholds required to prevent bloom formation in both water and sediments, discuss the essential role of nutrient modeling in guiding management decisions, and illustrate these concepts through case studies that demonstrate successful nutrient reduction strategies. Together, these topics provide an integrated framework for protecting water quality, maintaining ecosystem health, and securing the benefits aquatic systems provide to society.

### **Using the Adjuvant Topfilm to Improve Herbicide Control of Invasive Aquatic Plants**

*Dr. Lucia Marshall, Biosorb Inc.*

Biosorb® TopFilm™ is essential for managing alien invasive aquatic plants on a global scale. Using TopFilm has solved many aquatic invasive weed control problems in Europe and in the USA. TopFilm is a natural cereal grain-based microsponge technology that absorbs the treatment in the tank mix, delivers a uniform coating while being sprayed and dries to form a protective microsponge film which promotes rainfastness. This characteristic is necessary to increase the efficacy of herbicide treatments on invasive aquatic plants that are normally partially resistant to herbicide treatment, either because of inability to penetrate waxy leaves, or due to climatic conditions that prevent adequate uptake of slower acting herbicides. The extended rainfastness of up to 22 days allows entry of a sufficient dose of herbicides to give efficacy control. The financial benefits achieved are due to the extension of the spraying season, including making best use of the correct application timing periods by making unsuitable application days

suitable. These optimized cost efficiencies of herbicide applications and allow more rapid conclusion of eradication programs. The advantages of TopFilm over other adjuvant types, specifically for aquatic weed control have been demonstrated, especially with glyphosate as a relatively slow acting herbicide. TopFilm is non-toxic and was the first adjuvant approved for aquatic use in Europe. During regular use we have shown benefits for effective control of *Fallopia japonica*, *Rhododendron ponticum* and many other waxy-leaved weed species. Use of TopFilm reduces drift, minimizing non-target contamination. Results of extensive treatments conducted over 25 years in the USA and Europe are summarized here and key findings for improving control of Invasive Aquatic Plants are presented.

### **Toxic Waters: Understanding and Addressing Harmful Algal Blooms (HABs)**

*Chase Kilgore, SePRO Corporation*

Harmful algal blooms (HABs) are increasingly threatening aquatic ecosystems, public health, and local economies across the globe. This talk explores the science behind HABs—what they are, why they form, and how human activity and climate change are accelerating their frequency and intensity. Through vivid case studies and accessible explanations, we'll examine the environmental, health, and economic consequences of these blooms, from fish kills and contaminated drinking water to multimillion-dollar losses in tourism and fisheries. The presentation also highlights innovative monitoring technologies, nutrient management strategies, and policy interventions that offer hope for mitigation.

### **Comparative analysis of UAS multispectral sensor derived vegetation indices for assessing emergent aquatic plant control**

*Dr. Jonathan Fleming, Samford University*

Effective monitoring of invasive aquatic vegetation is essential for adaptive management, yet traditional field assessments are labor-intensive and spatially constrained. This study evaluated nineteen vegetation indices derived from five-band multispectral imagery collected by an unoccupied aerial system (UAS) to determine which best predict biomass and herbicide control efficacy of American frogbit (*Limnobium spongia*). Using mesocosm experiments conducted at Mississippi State University, we combined multiple machine-learning approaches (Random Forest, Gradient Boosting, XGBoost) with mixed-effects statistical models to identify robust spectral predictors of total biomass, emergent biomass, and visual coverage. Among all methods, chlorophyll-related and red-edge indices, including the Green Chlorophyll Index (GCI), Chlorophyll Red-Edge (CLRE), and Green NDVI (GNDVI), consistently ranked highest. Visual coverage was predicted most accurately (average  $R^2 = 0.57$  for machine learning;  $R^2 = 0.62$  for quadratic mixed-effects models), while biomass models achieved conditional  $R^2$  values  $> 0.64$ . Quadratic relationships between spectral indices and vegetation metrics revealed non-linear thresholds associated with canopy density and chlorophyll saturation, underscoring the need for non-linear modeling approaches. The inclusion of spatial heterogeneity metrics (standard deviations) further improved predictive performance. These findings demonstrate that simple chlorophyll- and red-edge-based indices can provide reliable, non-destructive indicators of frogbit abundance and treatment response, supporting efficient UAS-based monitoring programs for aquatic plant management.

### **Using BioBase as an Aid for Lake and Pond Management**

*Jordan Holmes, Aquatic Control Inc.*

Using off-the-self sonar equipment and BioBases' online processing platform we can gather more accurate waterbody data which in turn allows for more accurate calculations in herbicide management, better placement of artificial fish structure, easier installment of aeration lines and diffusers and the ability to offer high quality bathymetric maps to our customers. While it is possible to do most of these things without

fully mapping a waterbody, being able to do so in a largely passive manner while on a fish or vegetation survey can increase data accuracy while keeping time on the water the same. I will be discussing how Aquatic Control has used the data processed through Biobase in some of the waterbodies we manage.

## **Texas APMS Session**

### **Understanding Phenology of Invasive Aquatic Plants to Inform Management Initiatives in the United States-**

*Dr. Gray Turnage, Mississippi State University*

Invasive aquatic plants are an increasing global problem that have limited management strategies when contrasted with terrestrial invasive plants. The most effective plant management strategies for invasive species are those that maximize stress on target species when internal energy reserves are low (i.e., weak points in the plant life cycle). Understanding the phenology of invasive aquatic plants can help resource managers time management initiatives to maximize stressors during weak periods of target species. Phenology is the study of the seasonal timing of critical life stages in plants in response to environmental cues (e.g., temperature or photoperiod), whereby the allocation of biomass and other resources, such as carbohydrates, are fundamental aspects during these life stages. Oftentimes, aquatic plants exhibit cyclical seasonal growth patterns that allow researchers to identify periods of low plant energy reserves (i.e., weak points in the life cycle) that can be exploited for management activities that maximize stress on the target species (e.g., mechanical, chemical, or biological control methods). Biomass data was collected over two years for invasive aquatic plant species in the United States (curlyleaf pondweed [*Potamogeton crispus*] and parrotfeather [*Myriophyllum aquaticum*]) and correlated to environmental parameters (air temperature and photoperiod) to predict natural weak points in plant phenology. Starch, which is a component of carbohydrate reserves, was also quantified in parrotfeather tissues to further validate predictions of weak points in the plant life cycle. Spring and late fall were identified as weak points of curlyleaf pondweed phenology, based on biomass allocation, and therefore suitable times to implement management strategies to maximize stress. Late summer was identified as the weakest phenological point in the parrotfeather life cycle based on biomass allocation and starch content suggesting management should coincide with this period to maximize stress on this species. Phenological data are necessary when developing management strategies to better manage invasive species and potentially selectively reduce target species when growing as part of a mixed plant stand. However, not all management strategies are appropriate for use during all plant life stages as desirable species may be present during some stages of the target species life cycle. Therefore, target plant phenology and the presence of non-target species should be considered prior to initiating management activities as each may influence selection of appropriate management techniques that simultaneously target to weak points of the invasive species life cycle while minimizing impacts to non-target species.

### **Evaluating Liming Formulations for Water Quality Improvement and Clearing Response in Aquatic Systems**

*Dr. Todd Sink, Texas A&M University*

Liming is a widely used management practice in aquatic resource management to improve water chemistry and stabilize pH fluctuations. The addition of calcium-containing compounds, such as agricultural lime, enhances alkalinity, hardness, and calcium levels, supporting aquatic productivity and buffering capacity. However, the solubility, availability, and perceived ease of use of liquid lime formulations have led some managers to utilize these alternatives, believing label claims that significantly less material is required to

achieve the same result, despite limited research on the effectiveness of these products. This study evaluates the impact of crushed agricultural lime and a commercially available liquid lime product on water quality parameters and sediment flocculation in two experiments. In Experiment 1, replicated outdoor mesocosms with and without sediment were treated with either agricultural or liquid lime to assess their effects on water alkalinity, hardness, pH, and calcium over eight weeks. In Experiment 2, increasing dosages of each lime product were tested in a clearing assay to determine their capacity to flocculate suspended clay particles. Observations suggest differences in the magnitude and rate of response between formulations, influenced by both dosage and soil presence. These results will provide science-based recommendations to pond managers considering liming strategies for water quality improvement, nutrient availability manipulation, and water clarification, particularly in regions with acidic soils or low buffering capacity.

### **Storm-resilient Floating Mat Systems for aquatic Plant Growth and Wetland Restoration**

*Nirmal Kumar, Prairie View A&M University*

This study evaluates the effectiveness of storm-resilient floating mat systems for the cultivation of aquatic plants in a field-based environment. Implemented on a pond, the research addresses the dual objectives of ecological restoration and sustainable biomass management under challenging weather conditions. Three robust plant species, *Juncus effusus*, *Panicum virgatum*, and *Typha latifolia*, were selected for their adaptability, resilience, and contribution to ecosystem function. The floating mats were engineered for stability using concrete anchors and stainless-steel supports, and plants were established through both rooted transplants and seedling propagation. System performance was monitored biweekly, integrating meteorological data from NASA GPM rainfall gauges and World Meteorological Organization (WMO) storm classifications. Elemental analysis (CHNS) of the harvested biomass (*Juncus effusus*) revealed 38.42 % carbon, 5.32% hydrogen, 0.91% nitrogen, and 0.17 % sulfur. For the *Panicum virgatum*, CHNS analysis showed 45.19% carbon, 6.42% hydrogen, 0.77 % nitrogen, and 0.08 % sulfur, highlighting nutrient content and potential for ecosystem benefits. Results of biweekly monitoring demonstrated that the floating mat systems maintained structural integrity and supported viable plant growth during heavy rainfall (~50 mm) and high wind (6 m/s) conditions. These findings underscore the potential of floating wetlands as a scalable, climate-adaptive strategy for wetland restoration, biodiversity enhancement, and ecosystem sustainability.

### **Ecological Benefits and Propagation Strategies of Native Aquatic Plants**

*Haley Kokel - Fish On Aquatic Plants*

Native aquatic plants play a vital role in enhancing aquatic ecosystems by providing wildlife habitat, improving water quality, preventing erosion, and adding aesthetic value. Successful establishment begins with species selection based on existing vegetation and system goals, followed by proper nursery propagation techniques. This presentation will highlight the ecological benefits of native plants and demonstrate propagation methods, including seeds, cuttings, and divisions.

### **Managing Golden Algae Blooms with Non-Herbicide Alternatives: A Mesocosm Evaluation of AC Aqua**

*Dr. Todd Sink, Texas A&M University*

Harmful algal blooms caused by the haptophyte *Prymnesium parvum* (golden algae) pose increasing threats to aquatic ecosystems, especially in southern U.S. reservoirs, aquaculture facilities, and farm ponds. Blooms of this toxin-producing algae can result in extensive fish kills, reduce biodiversity, and impair water use for recreation, agriculture, and fisheries. Current mitigation tools, including copper-based

algaecides and oxidizers, can be costly and harmful to sensitive aquatic life, prompting interest in alternative, low-impact management options. This research investigated the efficacy of AC Aqua, a proprietary humic acid-based water treatment, as a preventative and mitigation tool for *P. parvum* blooms. Outdoor mesocosm experiments were conducted under controlled bloom-inducing conditions, using varying application rates (prophylactic, low, and high), with and without sediment. Treatments with sediment showed rapid phosphorus reductions within six hours, while prophylactic applications significantly suppressed golden algae proliferation over a four-week period. Findings indicate that AC Aqua may serve as a practical, environmentally sound strategy for limiting *P. parvum* bloom formation and severity by enhancing natural biogeochemical processes.

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## **THURSDAY, NOVEMBER 6**

### **Workshop Session 1**

#### **Ecology and Life History of AIS**

*Dr. John Madsen, JD Madsen Consulting LLC*

Understanding the ecology and the life history of target invasive aquatic plant species will enhance the manager's ability to effectively and efficiently control target plant species, including where and when to find and control them. Three topics will be considered: growth forms of aquatic plants, environmental factors that drive the growth and distribution of aquatic plants, and the life history types of aquatic plants. Examples of how these factors are important in planning and implementing management will use common target aquatic plant species; such as water hyacinth, hydrilla, Eurasian watermilfoil, and others.

#### **Environmental Fate and Toxicity of Herbicides Used for Aquatic Plant Control**

*Dr. Gray Turnage, Mississippi State University*

This presentation will cover basics of calculating herbicide rates, application methods, and environmental fate of herbicides labelled for use in aquatic environments.

### **Workshop Session 2**

#### **Laws and Regulations around Aquatic Plant Management**

*Carlton Layne, Aquatic Ecosystem Restoration Foundation*

Aquatic herbicide use is strictly regulated by a combination of federal and state laws to protect human health and the environment, particularly water quality. Key federal laws include the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Clean Water Act (CWA). FIFRA makes it a violation of federal law to use any pesticide in a manner inconsistent with its labeling. The CWA directly affects aquatic pesticide use by requiring a permit for any application that results in a "point source discharge" of pollutants into waters of the U.S. Since pesticides are considered pollutants under the CWA, applicators must obtain a National Pollutant Discharge Elimination System (NPDES) permit before beginning certain activities. Although Federal Regulations must be followed across the U.S, State regulations can be more stringent than federal rules and often require special licensing and permits.

**Calibrating aquatic herbicide applications to avoid violating federal and state law**  
*Dr. John Madsen, JD Madsen LLC*

Many applicators have the misapprehension that calibration is simply using the correct concentration of the formulation for a spot treatment, but this is not the case. Spot treatments are only for individual plants, not larger areas, and result in under or over treatment. A substantial overtreatment will result in violating FIFRA and the Clean Water Act. This presentation will discuss how to calculate the treatment rate and correctly apply a calibrated application for both foliar and submersed treatments.

**Workshop Session 3**

**Texas Statewide IPM of Aquatic and Riparian Invasive Species-**  
*John Findeisen - Texas Parks and Wildlife*

This presentation will provide an update on Texas Parks and Wildlife Department's aquatic vegetation and invasive species management efforts in Fiscal Year 2025 (Sept. 2024 – Aug. 2025), with a focus on implementation of an Integrated Pest Management (IPM) strategy. Texas' IPM strategy employs a combination of prevention, herbicide treatments, biological control efforts, and outreach for not only prevention but also to promote environmental stewardship (e.g., enhancing creek health). Early Detection and Rapid Response (EDRR) capacity is vital to efforts to monitor for new infestations of the most problematic species such as giant salvinia (*Salvinia molesta*) and zebra mussels (*Dreissena polymorpha*) and mount a rapid response when feasible. Management efforts continue to focus on floating, aquatic invasive plants and riparian invasive plants that crowd or shade out native plants, degrade habitat for fish and wildlife, and inhibit boater access. Management of aquatic and riparian invasive species using an IPM approach plays a key role in conserving Species of Greatest Conservation Need (SGCN) and providing hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations.

**Vegetation Management on a Large Scale Constructed Wetland for Water Reuse**  
*T. Wells Shartle - Tarrant Regional Water District*

The George Shannon Wetland, developed by the Tarrant Regional Water District (TRWD), is a nearly 1,880-acre constructed treatment wetland designed to enhance water supply reliability for Richland Chambers Reservoir during drought conditions. This reuse system is capable of polishing up to 100 million gallons per day (MGD) of raw water diverted from the Trinity River by significantly reducing sediment and nutrient loads through natural wetland processes. The finished wetland water is pumped into Richland-Chambers Reservoir, from which it is delivered to municipal water systems to supply the 2.5 million TRWD customers. Following consumption and wastewater treatment, effluent is discharged back into the Trinity River, completing the reuse cycle when it is recaptured at the wetland intake. Situated within the Texas Parks and Wildlife Department's (TPWD) Richland Creek Wildlife Management Area – Carl Frentress Unit, the wetland is managed through a cooperative agreement between TRWD and TPWD. This partnership emphasizes vegetation management strategies that support both ecological and operational objectives, primarily optimization of water quality treatment performance and enhancement of waterfowl habitat for public recreation. Vegetation control efforts have employed a suite of techniques—moist soil drawdowns, biological agents, mechanical harvesting, and chemical applications—to suppress invasive or nuisance species and promote a diverse, functional plant community. This presentation will provide details of these management approaches, highlighting both successful outcomes and persistent challenges encountered over the course of wetland operation since

2013. Additionally, water quality monitoring results that demonstrate the wetland's effectiveness in reducing nutrient and sediment concentrations, supporting its role as a critical component of TRWD's reuse strategy.

## **Workshop Session 4**

### **Comprehensive Approaches to Safety in Diverse Environments**

*Cary Martin, Nutrien*

Safety is a universal responsibility that extends across multiple aspects of daily life—from the roads we travel to the waters we navigate, the chemicals we use, and the natural habitats we share. This presentation explores four key dimensions of personal and environmental safety: driving safety, boating safety, pesticide safety, and wildlife safety. Participants will gain insight into best practices that reduce risks, prevent accidents, and promote a culture of mindfulness and preparedness. Emphasis will be placed on understanding human behavior, environmental awareness, and regulatory standards that guide safe conduct in each area. Through practical examples, the presentation will highlight how proactive education and responsible decision-making can protect lives, property, and ecosystems. Ultimately, this session aims to foster a holistic understanding of safety as an interconnected system—where awareness and action combine to create safer communities and sustainable environments.

### **Hands-on Plant ID Session**

*Dr. Gray Turnage, Mississippi State University*

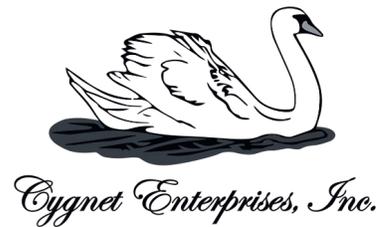
This presentation will focus on aquatic plant ID for common species in southeastern reservoirs. The presentation will include a hands-on component where attendees can handle and manipulate plants to see pertinent morphological details that are critical for correct ID in field sites.



# MSAPMS & TAPMS



WOULD LIKE TO THANK OUR EXHIBITORS



## **SPEAKER BIOGRAPHIES**

*(In Alphabetical Order by Last Name)*

### **Belk, Patrick**

Patrick Belk is a Graduate Research Assistant and second-year master's student working on upland and aquatic invasive plant management research at the UF/IFAS Center for Aquatic & Invasive Plants in Gainesville, FL.

### **Chambers, Elizabeth**

Elizabeth Chambers is a Reservoir Habitat Biologist with the Arkansas Game and Fish Commission (AGFC). She holds a degree in Wildlife Management and Ecology from Arkansas State University (2016). Her expertise encompasses bat population research, desert tortoise surveys, plant taxonomy, and fisheries management. At the AGFC, Mrs. Chambers specializes in aquatic vegetation management, collaborating with fisheries biologists, constructing habitat, and overseeing statewide aquatic herbicide applications. She holds a non-commercial aquatic license and conducts small-scale sprays in South Arkansas. Currently, she is pursuing a Master's degree in a conservation-related field through Oregon State University.

### **Chesser, Brittany**

Brittany Chesser graduated from Delaware State University with her B.S. in Natural Resources and later went on to receive her M.S. in Wildlife, Fisheries, and Aquaculture at Mississippi State. Brittany joined her current role in 2019 as Aquatic Vegetation Management Program Specialist for Texas A&M Agrilife Extension Service. Her primary duties include providing technical expertise on aquatic vegetation management to the public through identifying plant species, recommending correct management practices, delivering presentations and outreach materials, and maintaining AquaPlant.tamu.edu. Additionally, she is the Lab Specialist for the TAMU Aquatics Diagnostic Laboratory where she performs routine water quality analyses and other diagnostics, produces client reports, and recommends amendments. She is currently a Ph.D. Candidate in the Department of Rangeland, Wildlife, and Fisheries Management at Texas A&M University.

### **Coulon, Michael**

Michael has worked in the Aquatic Plant Control section of the Louisiana Department of Wildlife & Fisheries for nine years, and is currently the Aquatic Plant Control biologist manager for the south Louisiana district. He has assisted with the management of invasive aquatic weeds throughout the inland lakes, river systems, and coastal marshes of south Louisiana, primarily addressing floating and emergent nuisance species.

### **Dues, Anthony**

Anthony Dues is a junior doing a dual degree in Marine Science and Philosophy with a minor in Climate Change at Florida Gulf Coast University. After graduation, he plans to move on to graduate school and eventually attain a PhD in a conservation related field. Anthony wants to see the environment thrive and to fix the world's issues through research, education, and policy.

### **Engle-Wrye, Nicholas**

Nicholas J. Engle-Wrye is a Ph. D. candidate and research associate at Mississippi State University Geosystems Research Institute. Nicholas's doctoral research integrates phylogenetics, chemical ecology, pollination biology, and niche modeling to investigate biotic and abiotic drivers of hybridization in plants, as well as how phenotypic traits influence patterns of evolution. At the Geosystems Research

Institute, his current work focuses on identifying and evaluating best management practices for controlling invasive aquatic plant species.

### **Findeisen, John**

John Findeisen is currently the Team Leader for the Texas Parks and Wildlife Department's Aquatic Habitat Enhancement (AHE) Team in Brookeland, Texas. He earned a B.S. in Wildlife and Fisheries Sciences from Texas A&M University and a M.S. in Biology (emphasis in Aquatic Biology) from Southwest Texas State University. John has been employed by the Texas Parks and Wildlife Department for 30 years. His first 20 years were as a fisheries management biologist in the Corpus Christi District fisheries management team and the last 10 years as an invasive species biologist with the AHE team in February 2016.

### **Fleming, Jonathan**

Jonathan Fleming is an Associate Professor of Geography at Samford University, where he teaches applied GIS, remote sensing, and environmental geography, and directs both the undergraduate GIS program and the graduate GIS Certificate. He holds an M.S. and Ph.D. from Mississippi State University, and his research interests include GIS-based spatial analysis and monitoring, UAS mapping, landscape change, and invasion ecology. A certified GISP and FAA Part 107 Remote Pilot, Dr. Fleming works primarily with undergraduate students applying spatial technologies for environmental assessment and habitat conservation, including applications relevant to aquatic systems.

### **Gebhart, Maxwell**

Maxwell is an invasive plant biologist interested in aquatic plants typically associated with wetland environments. His research typically focuses on the biological and ecological traits of invasive plant species such as *Vallisneria × pseudorosulata* and *Butomus umbellatus*; but has recently started focusing on management strategies for invasive plant species.

### **Gettys, Lyn**

Dr. Lyn Gettys (Gettys rhymes with lettuce!) is an Associate Professor of Agronomy (Aquatic and Wetland Plant Science) and has been based at the University of Florida IFAS Fort Lauderdale Research and Education Center in Davie since 2012. She holds a bachelor's degree in horticulture from the University of Florida, a master's degree in plant breeding from North Carolina State University and a Ph.D. in plant genetics from the University of Florida. Dr. Gettys has written or co-authored 83 refereed papers, 23 peer-reviewed Extension documents, 3 CABI monographs, 136 conference abstracts, and 55 trade journals and newsletter articles. Her research focuses on the biology and ecology of native and introduced aquatic and wetland plants, management of invasive aquatic plants, and developing methods to improve the success rate of aquatic habitat enhancement and restoration projects. Her Extension efforts include providing leadership for the UF/IFAS Aquatic Weed Control Short Course, which attracts more than 500 attendees every year, and serving as a subject matter expert and speaker on aquatic plant biology and control for stakeholders throughout Florida.

### **Goodwin, Patrick**

Patrick Goodwin holds a B.S. in Biology from the University of North Florida and an M.S. in Lake Management from SUNY Oneonta. He is a certified lake manager with over ten years of experience in water resource management. Patrick specializes in data collection to evaluate nutrient loading and the consequences of that loading in terms of algal blooms and water clarity. He has written numerous comprehensive lake management plans and has unique industry insight into applied restoration techniques, where he has conducted numerous experiments evaluating restoration techniques. Patrick

has successfully restored multiple water bodies and is considered an expert in oxygenation and circulation techniques.

### **Holmes, Jordan**

Jordan graduated from Indiana State University in 2016 with a Bachelor of Science degree in biology and has been working in research and conservation since 2015. He began his career with Aquatic Control in the spring of 2019 as part of the Lakes and Special Projects Department where he assists with state sponsored Lake and River Enhancement (LARE) projects, large lake Harmful Algal Bloom (HAB) projects and vegetation management projects as well as benthic mapping projects.

### **Kilgore, Chase**

Chase is the Aquatic Research Manager at SePRO Corporation, where he has worked for the past five years. His career spans multiple scales of the water resources industry—from molecular research on cyanobacteria to hands-on field application as an applicator. Chase has held positions at both the University of Florida and New Mexico State University, bringing a unique blend of academic insight and practical expertise to his work.

### **Kokel, Haley**

Haley Kokel owns and operates Fish on Aquatic Plants, a native aquatic plant nursery in College Station, Texas. Haley earned her Master's degree from Texas A&M University through research on native aquatic vegetation establishment. Prior to opening her nursery, Haley worked for Texas Parks and Wildlife and Missouri Department of Conservation where she implemented plant propagation and planting techniques for vegetation restoration in state lakes. Haley rejoined TAPMS in 2019 after moving back to Texas and has been on the Board of Directors since 2021. Haley enjoys fishing, leatherworking, gardening, hunting, and spending time with her family.

### **Kumar, Nirmal**

Nirmal Kumar is currently a Postdoctoral Researcher at Prairie View A&M University, Texas, USA. He holds a Ph.D. in Water Resources and is an experienced hydrologist and environmental researcher specializing in surface and subsurface hydrology. His research focuses on sustainable management practices for environmental modeling with an emphasis on greenhouse gas reduction and carbon stock enhancement, and nature-based solutions for improving water quality.

### **Layne, Carlton**

Carlton is the Executive Director of the Aquatics Ecosystem Restoration Foundation. Prior to that, he was a law enforcement officer of EPA, Office of Pesticide Program, Region 5. Carlton is particularly skilled in the investigation of pesticide incidents to determine compliance with federal, state and/or tribal requirements under applicable statutes and ordinances. In particular, he has expertise in both label interpretation and development in terms of applicability in the field by users, legal requirements and enforcement.

### **Lessley, Burford**

Burford Lessley is a regional fisheries biologist for the Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP). He serves the Central Region that includes several oxbow lakes along the Mississippi and Yazoo Rivers, Ross Barnett Reservoir, and numerous state fishing and state park lakes. He received a bachelor's degree wildlife and fisheries from Mississippi State University in 2014 and a master's in biology from the University of Texas Rio Grande Valley in 2016.

**Lovell, Graves**

Graves has worked as a district fisheries biologist with ALDCNR for 19 years. Prior to that he was a biologist with Southeastern Pond Management. He obtained a M.S. in Fisheries Management and a B.S. in Wildlife Management, both from Auburn University.

**Madsen, John**

Dr. John D. Madsen is currently a consulting scientist. In December 2022, he retired from his position as a Research Biologist with the US Department of Agriculture, Agricultural Research Service on the campus of University of California-Davis. He was previously a faculty member at Mississippi State University for eleven years, and a Research Biologist with the US Army Engineer Research and Development Center for nine years. Dr. Madsen has been researching the biology, ecology and management of aquatic weeds and their impact on native aquatic plants for over 30 years. Dr. has also been an associate editor for Journal of Aquatic Plant Management and has served on numerous society boards. He has more than 130 peer-reviewed journal publications. Dr. Madsen has a Bachelor of Science degree from Wheaton College, Wheaton, IL, and Master of Science and Doctor of Philosophy degrees in Botany from the University of Wisconsin-Madison.

**Marshall, Lucia**

Dr. Marshall received her Ph.D. in Biochemistry from Rice University, an NIH Postdoctoral Fellowship at the University of Texas Medical School, Houston, and a Research Associate position at the University of Pennsylvania with Bell Laboratories. She was hired by Monsanto to establish their first Drug Delivery Laboratory prior to the purchase of G.D. Searle. While at Monsanto, she worked in pharmaceutical product development with California Institute of Technology and with Washington University Medical School, later becoming Research Group Leader in agricultural formulations. In 1994, Dr. Marshall initiated Trans America Product Technology, Inc. (TAPT), a consulting firm specializing in product development for pharmaceutical, nutraceutical, horticultural and agricultural formulations. Working with natural products and biopesticides, the Biosorb® Microsponge™ technology was developed and patented.

**Martin, Cary**

Cary Martin began his love of all things water at an early age. His first job was working with Sharks, Stingrays and Sea Turtles at Sea World of Florida. Expanding on his newly obtained knowledge in aquatic eco-systems, he joined the U.S. Coast Guard as a Marine Scientist and spent his tour in the rough cold waters of the Bearing Sea. After his tour, he focused on learning the ins and outs of lake management by working for one of Florida's largest lake management companies. Cary reverted to his Sea World days and thought about how aeration and circulation helped to improve the water quality. Taking a system that is used in aquariums and up-sizing it to be applied to the pond and lake scenarios, Cary invented his own Lake Bed Aeration systems, designed and sold these systems nationally and internationally. His background in Environmental Science and Fisheries combined with his dedication to community as the Past VP of the Central Florida Lake Management Society, Past President of the North Carolina Lake Management Society and Marine Safety officer in the US Coast Guard Auxiliary has allowed Cary the opportunity to work closely with groups about the entire Aquatic Eco System and how the parts work symbiotically together.

**McLean, Tim**

Tim has been with Alabama Power's aquatic plant management team since 2017. He graduated from Auburn University in 2005 with a degree in fisheries science.

**Riner, Amber**

Amber Riner is a graduate research assistant at the Center for Aquatic and Invasive Plants at the University of Florida. She received a BS in Environmental Science and an MS in Agronomy from the University of Florida as well. Her current research focus is on the phenology and management of Connecticut River hydrilla.

**Risley, Jeremy**

Jeremy Risley is the Statewide Black Bass Program Coordinator for the Arkansas Game and Fish Commission. A native of Arkansas, he has worked for the AGFC for 20 years. He is dedicated to improving black bass populations and their habitats throughout the state.

**Shartle, T. Wells**

T. Wells Shartle has over 10 years of experience in wetland management and water quality monitoring. He oversees the water quality laboratory and maintains long-term data sets for the George Shannon Wetland, a 1,880-acre reuse system supporting Richland Chambers Reservoir. Wells holds a BBA in Management from Baylor University and an MS in Environmental Science from Stephen F. Austin State University, where he focused on nutrient cycling in treatment wetland soils. His work supports TRWD's mission to improve water quality and enhance ecological function through sustainable reuse practices. He collaborates with TPWD to align vegetation management for waterfowl habitat and water quality goals.

**Singh, Bhupinder**

Bhupinder Singh is a Master of Science student in Biotechnology at the University of Houston, where he also serves as a Research Assistant and Teaching Assistant under the supervision of Dr. Venkatesh Balan on an EPA-funded project focused on phytoremediation and growth efficiency of aquatic plants in simulated aquatic environments. His research focuses on phytoremediation and environmental biotechnology, with a particular emphasis on the use of floating treatment wetlands for removing nutrients and heavy metals in aquatic systems. He has co-authored a review article on floating wetlands published in Applied Sciences (MDPI) and has experience in molecular biology, bioinformatics. Singh is passionate about advancing sustainable biotechnology solutions through hands-on research.

**Sink, Todd**

Dr. Todd Sink has more than 25 years of experience in aquatic ecosystem management research and extension spanning aquaculture, aquatic vegetation management, water quality, and pond (sport fish) management. Dr. Sink holds a B.S. from Purdue University in Fisheries and Aquatic Sciences and a Ph.D. from the University of Tennessee in Natural Resource Management (fish stress and disease physiology) and is currently a Professor in the Department of Rangeland, Wildlife, and Fisheries Management at Texas A&M University and statewide Aquaculture Extension Specialist for the Texas A&M AgriLife Extension service, where he is also Director of the Aquatic Diagnostic Laboratory. Current research projects include genetic improvement of red drum, mitigating ammonia spikes in aquaculture, freeze protection in warmwater aquaculture species, aquatic plant herbicide trials, and evaluation of commercial pond management products.

**Turnage, Gray**

Dr. Gray Turnage has over a decade of research experience with invasive aquatic and wetland plants. He has been involved with several projects nationwide establishing control efforts and protocols for invasive aquatic and wetland plants as well as monitoring those efforts to analyze success of the protocols he has helped to develop ([www.gri.msstate.edu](http://www.gri.msstate.edu)). His projects range in size from entire watersheds to private ponds. This work regularly includes consulting with resource managers and

landowners, developing management plans for public and private entities, and monitoring temporal changes in plant community dynamics. He is an active member of the MidSouth and National Aquatic Plant Management Societies (APMS) and engages other APMS chapters on a regular basis.

**Turner, Stephen**

Stephen is the Program Manager for the TVA Aquatic Plant Management Program and is based in Guntersville, AL. He received his B.S. in Environmental Biology from Jacksonville State University, then attended graduate school at Auburn University in Fisheries Biology. Stephen spent 20 years in the Pond and Lake Management industry prior to his working for TVA for the last 6 years. He oversees the management of aquatic plants throughout the entire TVA system, oversees treatment of around 2,500 acres of aquatic plants annually, harvesting about 1,000 acres of aquatic plants from TVA reservoirs annually and works in partnership with multiple state agencies, local governments, and stakeholder groups to provide management on multiple waterbodies throughout TVA's footprint.

**Vuillequez, Corrina**

Corrina Vuillequez graduated from the University of Florida in 2021 with a bachelor's degree in plant science. She currently is a graduate student as well as a researcher at the Center for Aquatic and Invasive Plants for Dr. Ben Sperry at UF. Her master's research focuses on developing novel control methods for the invasive aquatic plant crested floating heart. Outside of her thesis, she conducts research on other aquatic species such as giant salvinia, water hyacinth, hydrilla, and vallisneria.

**Wilson, Damar**

Damar Wilson is a Graduate Research Assistant in the Cooperative Agricultural Research Center at Prairie View A&M University. His research focuses on aquatic plant utilization, biochar applications, and greenhouse gas monitoring in agricultural systems. He has conducted field-scale studies on Juncus-derived biochar and fertilizer interactions, as well as wetland ecosystem carbon dynamics using AmeriFlux data. His broader research interests include aquatic and agroecosystem management, nutrient cycling, and climate-smart agricultural practices.