48th Annual Meeting of the Mississippi Chapter of the American Fisheries Society

Hattiesburg, MS

February 16 to 18, 2022

Sponsors

- Gulf Coast Research Laboratory, University of Southern Mississippi

- Division of Coastal Sciences, University of Southern Mississippi

- Coastal Conservation Association of Mississippi

- Center for Fisheries Research and Development at USM's Gulf Coast Research Laboratory

Program-at-a-Glance

All activities will take place in Magnolia Room 1 & 2 at the DoubleTree by Hilton Hattiesburg unless otherwise noted.

Date and Time	Event	Location
February 16, 2022		
5:00 to 6:00 PM	Registration	
5:00 to 9:00 PM	Evening Social Note: Cash Bar	
February 17, 2022		
8:00 to 9:00 AM	Registration	
9:00 to 10:15 AM	Morning Session I	
10:15 to 10:30 AM	Morning Break Coffee, Soda, and Snacks	
10:30 to 12:00 PM	Morning Session II	
12:00 to 1:30 PM	Lunch	On your own
1:30 to 2:30 PM	Afternoon Session I	
2:30 to 2:45	Afternoon Break Coffee, Soda, and Snacks	
2:45 to 4:00 PM	Afternoon Session II	
4:30 to 6:00 PM	Poster Session	
6:00 to 9:00 PM	Banquet Note: Cash Bar	
7:30 PM	Fisheries Jeopardy! Hosted by Samantha Bergeron and Stephen Brown	
February 18, 2022		
9:00 to 10:00 AM	Morning Session	
10:00 to 10:15 AM	Morning Break	
10:15 to 11:45 AM	MSAFS Business Meeting	
11:45 AM	Adjourn	

Schedule of Presentations

Day One, February 17, 2022

Session	Time	Author	Title
Morning Session I	09:00	Matthew Byrnes	The relationship between *Ruppia maritima* (widgeon grass) meadow complexity and habitat use by Gobiidae and other juvenile fishes
	09:15	Manuel Coffill-Rivera	Effects of Temperature on Growth, Metabolism, and Lower Dissolved Oxygen Tolerance of Speckled Peacock Bass *Cichla temensis*
	09:30	Jacob Zona	Gulf sturgeon in the Apalachicola River: Population structure and effective number of breeders
	09:45	Baylor Lynch	Ecological separation between congeneric shrimp species within Biloxi Back Bay
	10:00	Jordan Besson	Movers and stayers: A look into the movements of Silver Carp in an oxbow lake system
	10:15		Morning Break
Morning Session II	10:30	Elizabeth Greenheck	Occurrence of federally threatened Gulf Sturgeon (*Acipenser oxyrinchus desotoi*) outside of critical habitat area designation in Mobile Bay, AL.
	10:45	Yvanna Paez Mendez	The Effects of Temperature and Salinity on juvenile Atlantic Tarpon *Megalops atlanticus*
	11:00	Loren Stearman	High Erosional Activity in River Mainstems Correlates to Low Gene Flow in Tributaries
	11:15	Darren Shoemaker	Assessing the relationships of fish communities with climate and hydrology in agricultural headwater streams
	11:30	Jake Schaefer	Population genomics of Frecklebelly Madtom populations in Mississippi
	11:45	Suja Aarattuthodi	Development and characterization of a catfish cell line
	12:00		Lunch
Afternoon Session I	13:30	Jennifer Green	Migratory movements of Southern Flounder, *Paralichthys lethostigma*, in Mississippi coastal waters

Session	Time	Author	Title
Afternoon Session I	13:45	Calvin Rezac	An Assessment Of Saltmarsh Topminnow Status Across The Mississippi Coast Utilizing Boat Electrofishing
	14:00	Eric Gigli	Satellite tagging and real-time tracking of Atlantic Tripletail, *Lobotes surinamensis* in the northern Gulf of Mexico
	14:15	Marcus Drymon	More than just a time series: the value of fishery-independent surveys for delineating habitat suitability
	14:30		Afternoon Break
Afternoon Session II	14:45	Steven George	Freshwater mussels (Unionidae) of the upper Tensas River, Northeast Louisiana
	15:00	Todd Slack	Notes on the current distribution and habitat of the Sicklefin Chub in the Lower Mississippi River
	15:15	Jack Killgore	Spawning, Age, and Growth of Silver Carp in the Lower Mississippi River Valley
	15:30	Katherine Wright	Fecundity of the *Argulus flavescens* Ectoparasite on Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)
	15:45	Ana Osowski	An Overview of the Need for and Recent Development of Regional Fishermen Training Programs

Day Two, February 18, 2022

Session	Time	Author	Title
Morning Session	9:00	Nancy Brown-Peterson	What do we know about Red Snapper reproduction in Mississippi?
	9:15	Ryan Jones	Keys to successful management of giant salvinia (*Salvinia molesta*)
	9:30	Kasea Price	Gulf Sturgeon movement and travel patterns in the lower Pascagoula River in the main distributaries and adjacent smaller tributaries
	9:45	Angie Hoover	Shark diversity across three regions of the Chandeleur Island chain found in historic longline survey data

Abstracts for Platform Presentations (Chronological Order)

09:00 The relationship between *Ruppia maritima* (widgeon grass) meadow complexity and habitat use by Gobiidae and other juvenile fishes

Matthew A. Byrnes (The University of Southern Mississippi)
Eligible for a Student Award

Dr. Kelly M. Darnell (The University of Southern Mississippi)

Seagrasses are important submerged coastal habitats that support nearshore communities. The morphological complexity of the seagrass can impact its value as a nursery, shelter, or foraging area. *Ruppia maritima* (widgeon grass) is a widespread seagrass species that branches extensively when reproductive, increasing its leaf complexity. The goal of this study is to understand habitat use of reproductive and non-reproductive *R. maritima* by juvenile fishes, recognizing the morphological change undergone by the plant when flowering. During the peak reproductive season in Fall 2021 we sampled *R. maritima* at the Chandeleur Islands, LA to describe the spatial distribution and morphology of reproductive plants, and at a subset of stations we sampled juvenile fish assemblages. We qualitatively assessed spatial trends in *R. maritima* presence and occurrence of reproduction using ArcGIS, and we evaluated differences in shoot morphology through surface area, number of branches, and root to shoot ratios. We calculated Shannon diversity, evenness, and species richness to describe juvenile fish assemblages in reproductive and non-reproductive meadows. We specifically focused on Gobiidae for a subset of analyses due to their overwhelming presence in samples. *Ruppia maritima* was distributed along the entire length of the island, but the occurrence of reproductive plants was pacthy. Leaves of reproductive plants were more complex than non-reproductive plants, with greater surface area and number of branches. Fish diversity was highest in beds with an intermediate proportion of reproductive shoots, but Gobiidae specifically showed no significant relationship with the proportion of reproductive plants present. The results of this study help elucidate drivers and patterns of habitat use in *R. maritima*-dominated ecosystems.

09:15 Effects of Temperature on Growth, Metabolism, and Lower Dissolved Oxygen Tolerance of Speckled Peacock Bass *Cichla temensis*

Manuel E. Coffill-Rivera (Mississippi State University)
Eligible for a Student Award

J. Wesley Neal (Mississippi State University)

Peter J. Allen (Mississippi State University)

The Puerto Rico Department of Natural and Environmental Resources is considering the introduction of Speckled Peacock Bass *Cichla temensis* to control the expansion of invasive cichlid populations. However, introductory stocking of Speckled Peacock Bass will require appropriate hatchery protocols for handling, spawning, and grow-out. Speckled Peacock Bass have been documented to have high sensitivity to temperatures and low concentrations of dissolved oxygen, but the metabolic response to these environmental conditions has not been evaluated. Therefore, the effects of temperature (25, 30, and 35°C) on growth and lower dissolved oxygen tolerance (LDOT) of juvenile Speckled Peacock Bass (139 ± 1 mm, and 29.73 ± 0.64 g) were evaluated during an 8-week study. Fish were reared in 150-L aquaria and acclimated for 7 weeks prior to the growth study. Total length and total weight gains were similar for fish acclimated to 25°C and 30°C (25 ± 1 mm, 20.03 ± 1.65 g, and 26 ± 2 mm, 19.17 ± 1.90 g, respectively), while fish acclimated to 35°C had lower growth rates (7 ± 1 mm, and 0.79 ± 0.55 g). Standard metabolic rate (SMR), Q10, and LDOT of juvenile Speckled Peacock Bass were measured at the same temperatures using intermittent static respirometers after an acclimation period of 2 weeks. Speckled Peacock Bass had the lowest SMR at 25°C (144.09 ± 10.43 mg O2/kg/hr), followed by 30°C (208.16 ± 12.45 mg O2/kg/hr), and 35°C (345.56 ± 19.89 mg O2/kg/hr). The Q10 for 25-30°C and 30-35°C were 2.08 and 2.76, respectively; the Q10 for 25-35°C was 2.40. The LDOT of Speckled Peacock Bass at 25, 30, and 35°C was a pO2 of 30, 45, and 90 mmHg, respectively. These results indicate Speckled Peacock Bass are sensitive to temperatures near 35°C, therefore, we recommend rearing Speckled Peacock Bass at 25-30°C with dissolved oxygen concentration approaching saturation.

09:30 Gulf sturgeon in the Apalachicola River: Population structure and effective number of breeders

Jacob Zona (University of Southern Mississippi)
Eligible for a Student Award

Brian Kreiser (University of Southern Mississippi)

Adam Kaeser (United States Fish and Wildlife Service - Panama City)

Adam Fox (University of Georgia)

Sturgeon comprise an ancient family of fishes, Acipenseridae, dating back over 80 million years. This prehistoric group is now considered one of the most endangered animal taxa on the planet, with over two-thirds of species listed as critically endangered by the IUCN Red List of Threatened Species. The Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is a large, anadromous subspecies native to the eastern Gulf of Mexico and currently federally listed as Threatened. Published information on population structure and recovery status is still needed in many river systems in which they remain. In this study, genetic techniques were used to identify intra-drainage population structure and provide cohort-based estimates of the effective number of breeders (Nb) within the Apalachicola River. Our population structure analysis detected the presence of two unique populations within the Apalachicola River, corresponding to spring and fall spawning groups. This makes the Apalachicola the third river system shown to support an additional population that spawns exclusively during the fall. The genotypic information of juveniles was then used to estimate Nb for each cohort between 2012 and 2019. Estimates of Nb in the spring cohorts ranged from 36 to 94 and for fall cohorts ranged from 8 to 16. These results provide insight into the recovery status and life history of Gulf sturgeon within the Apalachicola River and create a baseline for future monitoring. They also allow the opportunity to investigate the effects of different natural and anthropomorphic alterations to the river during certain years or times of the year. This research lays the blueprint for similar studies across the remaining range of the Gulf sturgeon.

09:45 Ecological separation between congeneric shrimp species within Biloxi Back Bay

Baylor K. Lynch (Division of Coastal Sciences, School of Ocean Science and Engineering, The University of Southern Mississippi, Ocean Springs, MS 39564)
Eligible for a Student Award

Glenn T. Schumacher (Division of Coastal Sciences, School of Ocean Science and Engineering, The University of Southern Mississippi, Ocean Springs, MS 39564)

Michael J. Andres (Division of Coastal Sciences, School of Ocean Science and Engineering, The University of Southern Mississippi, Ocean Springs, MS 39564)

Kevin S. Dillion (Division of Coastal Sciences, School of Ocean Science and Engineering, The University of Southern Mississippi, Ocean Springs, MS 39564)

Palaemonids are an ecologically important family of estuarine shrimps that serve as a trophic link between the benthos and many recreationally important fishes, penaeid shrimp, and other marsh residents. *Palaemon pugio* has been observed in diets of many fisheries species; however, those same studies have not published data regarding their congener *Palaemon vulgaris*. These species tend to co-occur along estuarine edge habitats but seem to prefer different sediments and salinity regimes. Our objective is to determine if competition is occurring between these two congeners by comparing their relative abundances and isotope niche spaces at various habitat types within an estuary. To study competition and trophic niches, we seasonally sampled edge habitats along the Biloxi Back Bay estuary from November 2020 to November 2021 using fyke nets fished for an entire tidal cycle. Collected organisms were identified to species, enumerated, and measured for total length and weight. We analyzed stable carbon and nitrogen isotope values (d13C and d15N) for up to 20 individuals from each collection. Relative abundance estimates from edge habitats showed P. pugio as the dominant congener ($U = 5434$, $p = <0.001$), likely because the predominant salinity regime was oligohaline to fresh. Preliminary results suggest there is low isotopic niche overlap between *P. pugio* and *P. vulgaris* where *P. Pugio* exhibited 2.0%-4.0% lower d15N values and higher d13C variability (1.0%-2.0%) at most habitats sampled. Stable isotopic niche spaces of each species were distinct between the most spatially separated sites illustrating a clear d13C isoscape along the salinity gradient. The two congeners appear to be feeding at different trophic positions based on their d15N values. The congeners relative abundance was driven by salinity; however, our isotopic analyses suggest that there is a partitioning of resources between these two species in the study area.

10:00 Movers and stayers: A look into the movements of Silver Carp in an oxbow lake system

Besson, J.C. 1,2 (1 Department of Wildlife, Fisheries, and Aquaculture, Mississippi State University, Mississippi State, Mississippi 39762 2 USGS, Mississippi Cooperative Fish and Wildlife Research Unit; Mississippi State University, Mississippi State, MS 39762)
Eligible for a Student Award

M.E. Colvin 1 (1 Department of Wildlife, Fisheries, and Aquaculture, Mississippi State University, Mississippi State, Mississippi 39762)

L.E. Miranda 1,2 (1 Department of Wildlife, Fisheries, and Aquaculture, Mississippi State University, Mississippi State, Mississippi 39762 2 USGS, Mississippi Cooperative Fish and Wildlife Research Unit; Mississippi State University, Mississippi State, MS 39762)

C.G. Dunn 1,2 (1 Department of Wildlife, Fisheries, and Aquaculture, Mississippi State University, Mississippi State, Mississippi 39762 2 USGS, Mississippi Cooperative Fish and Wildlife Research Unit; Mississippi State University, Mississippi State, MS 39762)

Silver Carp (*Hypophthalmichthys molitrix*) are an aquatic invasive species present in the Lower Mississippi River that could threaten native aquatic species, resources, and economies. Research has been conducted on movements of Silver Carp in many locations, but not in oxbow lakes which host many valuable economical and ecological resources. Silver Carp invade oxbow lakes and other water bodies via hydrologic connections which can potentially be managed with barriers. However barriers have varying efficiency that depends on the location, operation, and movement patterns of the targeted organism. This study observed movements of 49 acoustically tagged adult Silver Carp in Moon Lake and the surrounding water bodies of Yazoo Pass and the Old Coldwater River in the Lower Mississippi Alluvial Valley to inform barrier placement near the oxbow lake. Using 10 stationary acoustic receivers we observed 12% of the tagged Silver Carp moving up to 14 miles in a 24-hour periods during high flows from late March to mid-June, although movements did not appear associated with temperature or water stage. Overall, 88% of tagged Silver Carp stayed within Moon Lake, Yazoo Pass, and the Old Coldwater River while 12% of tagged Silver Carp moved downstream into the Old Coldwater, Coldwater, or the Mississippi River via the Yazoo Pass. Observed Silver Carp movement patterns indicate that placement of a barrier would be most effective within the Yazoo Pass, the hydrologic corridor used by all tagged fish to travel in and out of Moon Lake and may only need to be operated from March to June. This study did not observe juvenile Silver Carp, which may have different movement patterns.

10:30 Occurrence of federally threatened Gulf Sturgeon (*Acipenser oxyrinchus desotoi*) outside of critical habitat area designation in Mobile Bay, AL.

E. M. Greenheck (University of Southern Mississippi)
Eligible for a Student Award

A. J. Draper (University of Southern Mississippi)

M. S. Peterson (University of Southern Mississippi)

M. J. Andres (University of Southern Mississippi)

D. Kiene (University of South Alabama)

S. P. Powers (University of South Alabama)

Gulf Sturgeon (GS; *Acipenser oxyrinchus desotoi*) are a federally threatened, anadromous species that feed primarily in estuarine and marine systems from October–April. Previous studies have identified Mississippi barrier island habitats as critical habitat for GS natal to western river systems (the Pearl and Pascagoula rivers; west of Mobile Bay) as well as eastern river systems (the Escambia, Blackwater, Yellow, and Choctawhatchee rivers; east of Mobile Bay). However, little published documentation exist of GS use in Alabama waters around Dauphin Island and Fort Morgan as well as within Mobile Bay. Therefore, our objective is to describe habitat use of Mobile Bay by GS from both western and eastern systems. Gulf Sturgeon were captured, measured, and tagged in both eastern and western river systems from 2010–2021. Tagged individuals were detected by an array of 44–55 receivers maintained by the Dauphin Island Sea Lab from 2015–2022. A total of 103 adult (n=73) and subadult (n=30) GS were detected from both western (n=77) and eastern (n=26) populations around and within Mobile Bay since 2015, with 67 individuals detected between 2–7 consecutive years. The highest number of detections occurred at receivers deployed along the Dauphin Island bridge (which connects Mobile Bay to the Mississippi Sound) and within the mouth of Mobile Bay. Despite variable receiver effort between years, GS of both size classes were detected in the Mobile Bay north of the Middle Bay Lighthouse. Previous sediment and benthic macroinvertebrate sampling within areas of high GS detection showed relatively low percent sand content and high polychaete richness, both characteristics to foraging habitats previously identified in the Pascagoula River delta region. Sustained use of this system by GS from both eastern and western populations strongly suggests Alabama's waters are suitable habitat despite the natal population for this system being extirpated.

10:45 The Effects of Temperature and Salinity on juvenile Atlantic Tarpon *Megalops atlanticus*

Yvanna Paez Mendez (Mississippi State University)
Eligible for a Student Award

Patrick M. Graham (The University of Southern Mississippi, Gulf Coast Research Laboratory)

James S. Franks, Jr. (The University of Southern Mississippi, Gulf Coast Research Laboratory)

J. Wesley Neal (Mississippi State University)

Peter J. Allen (Mississippi State University)

Atlantic tarpon Megalops atlanticus are highly migratory sport fishes. Juveniles are found in marshes along the northern Gulf of Mexico Coast, which is near the northern limit of their distribution. Juveniles may overwinter in these areas during the first several years of their life. Low temperatures are known to cause mortality in adults, but the challenges of temperature are less understood in juveniles. Furthermore, salinity, which can change dramatically in these habitats, may have a synergistic effect with temperature. To examine the effect of temperature and salinity on juvenile tarpon, fish were collected from the Mississippi Gulf Coast and transferred to the South Farm Aquaculture Facility. The hematology of juvenile tarpon was examined in two different salinity environments (1, 30 ppt) and at two temperatures (15, 25 °C) mimicking conditions found in estuaries, followed by a low temperature tolerance test. Fish were acclimated to treatment conditions for two weeks and then blood samples were collected and analyzed from 14 fish per treatment. Hematological results, including hematocrit, pH, red blood cell concentration, hemoglobin content, and blood osmolality offered valuable insight into physiological challenges with low temperature and variable salinity. For the low temperature tolerance test, fish acclimated to 15°C were transferred to separate tanks and temperature was gradually decreased 1°C / hr until fish lost equilibrium. Fish at low salinity (1 ppt) lost equilibrium more rapidly than fish at high salinity (30 ppt). Results indicate tarpon are susceptible to low temperature which is exacerbated by low salinity, therefore, resource managers must be cognizant of winter habitat use by juvenile tarpon.

11:00 High Erosional Activity in River Mainstems Correlates to Low Gene Flow in Tributaries

Loren Stearman (University of Southern Mississippi)
Eligible for a Student Award

Jake Schaefer (University of Southern Mississippi)

Altered sediment regimes have important consequences for aquatic habitats and ecosystems. Researchers have exhaustively studied the effects of altered sedimentary dynamics, particularly sediment deposition, on local-scale ecological structure and function. Whether sedimentary dynamics play a strong role in spatial ecological processes and metapopulation dynamics is less clear. Sediment deficits and erosional activities from channel straightening and headcutting are common in rivers throughout the Gulf Coastal Plain and lead to altered stream morphology and stability in larger streams and rivers. We examine whether the degree of sedimentary activity and channel evolution in larger streams affects gene flow among populations of a headwater fish throughout southern Mississippi. We quantified sedimentary activity by measuring change in mainstem channel width, displacement, and sinuosity over a 10-year period in eleven watersheds. We used Next-Generation sequencing and Single-Nucleotide Polymorphisms (SNPs) to quantify genetic structure among populations of Blackspotted Topminnow (*Fundulus olivaceus*) among multiple headwater streams in the same watersheds. Basins with high sedimentary activity were characterized by low sinuosity and high degrees of channel displacement. STRUCTURE analysis found strong patterns of geographic structuring among watersheds. Within watersheds, subsequent analysis found complex patterns of structuring in some watersheds, but evidence of high rates of gene flow in others. Intra-watershed pairwise FST among tributaries was positively correlated with degree of mainstem channel displacement and negatively correlated with channel sinuosity. Our results suggest that channel evolution in river mainstems may be affecting the ability of headwater species to disperse across watersheds, decreasing metapopulation connectivity.

11:15 Assessing the relationships of fish communities with climate and hydrology in agricultural headwater streams

Darren Shoemaker (Mississippi State University)
Eligible for a Student Award

Dr. Robert Gillespie (Purdue University – Fort Wayne)

Dr. Peter C. Smiley Jr. (USDA Agricultural Research Service)

Fish communities in agricultural headwater streams across the United States are impacted by a variety of factors including water chemistry, habitat modification, and hydrology. Little research has been conducted on how fishes in these small streams respond to climate change. We examined the effects of climate and hydrology metrics on fish communities at nine sites in the Saint Joseph River, Indiana and Michigan and 18 sites in the Upper Big Walnut Creek, Ohio from 2006 to 2019. Air temperature, water temperature, precipitation, discharge, wet width, velocity, and water depth metrics were calculated seasonally (spring, summer, and fall) for each year. Fishes were collected seasonally by backpack electrofishing and seining and identified to species level. Nineteen fish community metrics were calculated from these sampling efforts. Principal Component Analyses were used to create axes which represented gradients of climate and hydrology metrics. Linear and generalized linear mixed effects analyses suggested hydrology is a stronger predictor of fish community structure than climate. Specifically, only percent open substrate spawners were influenced ($P < 0.05$) by climatic gradients alone and 13 response variables (abundance, Shannon diversity index, species richness, evenness, percent warmwater fishes, percent coldwater fishes, percent tolerant fishes, percent intolerant fishes, percent invertivores, percent planktivores, percent detritivores, percent substrate choosers) were influenced ($P < 0.05$) by hydrologic gradients alone. Three response variables (percent Percidae, percent herbivores, herbivore occurrence) were influenced ($P < 0.05$) by both climatic and hydrologic gradients. Additionally, the occurrence of coldwater and intolerant fishes were not influenced ($P >0.05$) by climatic or hydrologic gradients. However, climate may indirectly effect fish communities through its influence on hydrology and our results may reflect these indirect effects. Our study highlights the importance of understanding the relationships among climate, hydrology, and fishes for the conservation of fish communities in agricultural headwater streams.

11:30 Population genomics of Frecklebelly Madtom populations in Mississippi

Jake Schaefer (University of Southern Mississippi)

Brian Kresier (University of Southern Mississippi)

Langston Haden (University of Southern Mississippi)

Loren Stearman (University of Southern Mississippi)

Matt Wagner (U.S. Fish and Wildlife Service)

Habitat fragmentation and changes to natural flow regimes are thought to pose some of the greatest threats to aquatic biodiversity, particularly in the diverse native fish fauna in the southeastern US. Fragmented and isolated populations will be more susceptible to local extinction and range contractions that may initiate broader reductions in vital ecosystem services. The Frecklebelly Madtom (*Noturus munitus*) has a broad but disjunct distribution that includes portions of the upper Tombigbee and Pearl River drainages in Mississippi. Frecklebelly Madtoms inhabit medium to large tributaries where they were historically one of the more abundant benthic specialist taxa. Recent surveys have indicated the species is in decline in some portions of the range. Populations in the Pearl River appear stable despite geomorphic change, while Tombigbee populations may be fragmented in smaller tributaries. The purpose of this study was to assess population structure, genetic diversity, and broad patterns of intra-drainage connectivity of Frecklebelly Madtom populations in Mississippi. We used Next Generation Sequencing (Genotyping by Sequencing) to generate a large SNP dataset (over 3,000 loci) for 370 individuals from 84 sites. We present population genomic analyses (STRUCTURE, migrate, and metrics of diversity) aimed at better understanding the status of this species, and informing future management and conservation efforts.

11:45 Development and characterization of a catfish cell line

Suja Aarattuthodi (Mississippi State University)

Vandana Dharan (Mississippi State University)

Catfish industry is a major contributor to the economic sustainability of the southern United States. Viral diseases are a major concern in the hatchery and nursery phases of catfish rearing. The associated fish mortalities can affect availability of catfish fry and fingerlings impacting the viability of farm operations. Since treatment options are limited in the case of several viral diseases, early disease diagnosis and prophylactic measures are key to successful fish health management. For the emergent, emerging, and any uncharacterized fish viruses, the pathogenicity, potential host range, and viral inhibition methods need to be studied. The ability to propagate fish viruses in vitro using cell cultures is imperative in advancing virus research and to facilitate pathogen-targeted management strategies including vaccines and antiviral agents. Though cell lines are a very relevant research tool in virology, cell lines originated from ictalurid catfish are limited. The ictalurid cell line previously available from ATCC cell repository has recently been reported as cross-contaminated by brown bullhead (BB) cells. Lack of host-specific cell lines and contamination issues necessitated initiation of cell cultures from the fin tissues of hybrid catfish (<U+2640> channel catfish, *Ictalurus punctatus* x <U+2642> blue catfish, I. furcatus). A combination approach involving tissue explantation and enzymatic digestion methods were employed to develop the hybrid catfish fin (HCF) cell line. The fin cell cultures were passaged over 100 times and transitioned into an established cell line. The HCF cell line has been characterized, maintenance conditions optimized, species of origin molecularly authenticated, and its susceptibility to fish viruses evaluated. Susceptibility of HCF cell line to catfish viruses demonstrated the potential of these cells to propagate ictalurid viruses. This established ictalurid catfish cell line could serve as an efficient tool for virus studies, antiviral agent screening, and vaccine development benefitting catfish aquaculture.

13:30 Migratory movements of Southern Flounder, *Paralichthys lethostigma*, in Mississippi coastal waters

Jennifer Green (The Mississippi Department of Marine Resources (MDMR), Biloxi, Mississippi, USA)

Patrick Graham (Center for Fisheries Research and Development (CFRD), The University of Southern Mississippi, Ocean Springs, Mississippi, USA and Division of Coastal Sciences, School of Ocean Science and Engineering, The University of Southern Mississippi, Ocean Springs, Mississippi, USA)

Joshua Waters (The Mississippi Department of Marine Resources (MDMR), Biloxi, Mississippi, USA)

Paul Grammer (Center for Fisheries Research and Development (CFRD), The University of Southern Mississippi, Ocean Springs, Mississippi, USA)

Christopher Lapniewski (Center for Fisheries Research and Development (CFRD), The University of Southern Mississippi, Ocean Springs, Mississippi, USA)

Elizabeth Greenheck (Division of Coastal Sciences, School of Ocean Science and Engineering, The University of Southern Mississippi, Ocean Springs, Mississippi, USA)

Southern Flounder (*Paralichthys lethostigma*) is a popular sportfish species along the northern Gulf of Mexico and is the most harvested flatfish species in Mississippi coastal waters. Prompted by evidence of range-wide population declines and stakeholder concern, MDMR recognized a need to develop projects to increase knowledge of the Southern Flounder stock. In response, the MDMR and USM-CFRD began a collaborative acoustic telemetry project aimed at documenting the timing and environmental drivers of Southern Flounder movements from Mississippi estuaries to offshore waters, and subsequent returns to inshore habitats following presumed spawning activity. In 2021, cooperative tagging efforts were conducted in Biloxi Bay and Pascagoula drainages by MDMR and in St. Louis Bay by USM-CFRD. Southern Flounder were collected using fyke nets and traditional fishing methods, and externally fitted with InnovaSea V9 acoustic transmitters between August and November 2021. Tagged flounder (n= 96) ranged in size from 301 – 500 mm, with a mean of 393.6 ± 40.9 mm total length. Southern Flounder movement was monitored using several passive acoustic telemetry arrays deployed throughout the Mississippi Sound, St. Louis Bay, Biloxi Bay, Pascagoula Bay, and the barrier island passes. In total, over 300 acoustic receivers are deployed and maintained by MDMR, USM and other collaborators. As of December 2021, there were a total of 151,723 Southern Flounder detections from 74 individuals (77% of total tagged fish). Emigration from the Mississippi Sound was documented between September and December as indicated from detections by 33 individuals on receivers in barrier island passes. Through continued collaborative efforts, we hope to gain a better understanding of Southern Flounder migration patterns and connectivity between coastal drainages to enhance management of the species in Mississippi.

13:45 AN ASSESSMENT OF SALTMARSH TOPMINNOW STATUS ACROSS THE MISSISSIPPI COAST UTILIZING BOAT ELECTROFISHING

Calvin R. Rezac (Mississippi Department of Wildlife, Fisheries, and Parks, Research Department of Mississippi Museum of Natural Science)

Robert J. Ellwanger (Mississippi Department of Wildlife, Fisheries, and Parks, Research Department of Mississippi Museum of Natural Science)

Benjamin H. Chaffins (Mississippi Department of Wildlife, Fisheries, and Parks, Research Department of Mississippi Museum of Natural Science)

The Saltmarsh Topminnow*, Fundulus jenkinsi* (Evermann, 1892), is a marine-estuarine species found in Mississippi along the gulf coast and is dependent on the presence of saltmarsh habitat and dendritic tidal creeks located adjacent to main river channels. However, preferred marsh habitat is declining due to coastal development, sea level rise, pollution, as well as levee and canal construction. The species is currently reported as rare and sporadic throughout the entire distribution from Texas to Florida and is presently under review for federal listing with a listing decision in 2022. The last targeted survey for Saltmarsh Topminnow in Mississippi was completed in 2009, leaving an information gap of over a decade for the species in the state. Additionally, in a range-wide assessment of the species, Peterson et al. (2016) noted the difficulty to accurately assess the status with commonly available gears which may have historically underestimated Saltmarsh Topminnow populations. However, a recent Saltmarsh Topminnow survey by Louisiana Department of Wildlife and Fisheries (LDWF) demonstrated that a custom electrofishing boat with the ability to sample in high conductivity waters produced higher catch rates when compared to traditional methods. Herein, we used the methods developed by LDWF to assess the status of Saltmarsh Topminnow along the Mississippi coast. In 2021, we collected 61 species, including 3,151 Saltmarsh Topminnow at 42 of 50 sites (84%). Compared to other studies utilizing traditional gears (0.3-2.1 fish/collection), our average Saltmarsh Topminnow per collection was higher (63 fish/collection). These results indicate that Saltmarsh Topminnow populations are stable along the coast of Mississippi; although, future habitat loss is of concern. Additionally, our study supports the use of boat electrofishing as an effective gear targeting Saltmarsh Topminnow and other small-bodied surface-dwelling species during ideal sampling conditions (e.g., tides, salinity levels).

14:00 Satellite tagging and real-time tracking of Atlantic Tripletail, *Lobotes surinamensis* in the northern Gulf of Mexico

Eric M. Gigli (Mississippi Department of Marine Resources)

Atlantic Tripletail are a coastal migratory fish found throughout the world in tropical and sub-tropical waters. Little is known about the spawning, population dynamics, and associated movements of the species. In the Gulf of Mexico, Atlantic Tripletail are a highly sought-after species, with average annual landings of approximately 380,000 pounds (NMFS 2020). Most of the fishing effort in the northern Gulf of Mexico occurs during warmer months when the species is found nearshore, and efforts decrease in the cooler months when their movements are largely unknown. It is not clear to what geographical extent the species migrates throughout the Gulf of Mexico. To better manage and understand the migratory patterns of the species, the Mississippi Department of Marine Resources attached pop-up satellite tags to Atlantic Tripletail captured in the Mississippi Sound Tagging of wild-caught individuals occurred immediately prior to the expected migration of the fish during cooler months. In Fall 2019, Wildlife Computers miniPAT tags were deployed on ten fish using a bridle attachment method. Premature releases from all ten tagged fish limited the intended temporal coverage however migratory and environmental data was collected between late-August and mid-November. In Fall 2021, Desert Star SeaTag-GEO tags were deployed on 10 fish as well as a single Wildlife Computers miniPAT tag deployment. Deployments occurred throughout the Mississippi Sound between September and October. When the tag antenna breaches the surface of the water, SeaTag-GEO tags are capable of satellite communications throughout the deployments and provide GPS locations of variable confidence upon transmission. Six of the SeaTag-GEO deployments provided real-time tracking data covering Mississippi, Alabama, Louisiana, and adjacent federal waters between September and late-November 2021. The 2021 tags are programmed to transmit the archived deployment data in March or April 2022 and no premature tag releases have been identified to date.

14:15 More than just a time series: the value of fishery-independent surveys for delineating habitat suitability

J.M. Drymon (Mississippi State University)

S.P. Powers (University of South Alabama)

Fishery-independent surveys are fundamental for developing the indices of relative abundance used during the stock assessment process. However, these surveys are increasingly used to quantify the factors that influence species' distributions. Collectively, this information is crucial for implementing effective management and conservation practices, yet is challenging for highly vagile species. To illustrate this, we present two case studies focused on coastal sharks and red drum (Sciaenops ocellatus) wherein we sought to quantify abiotic factors that influence seasonal variation using data from a long-term fishery-independent bottom longline survey in the northern Gulf of Mexico. Between May 2006 and November 2018, we conducted 1,226 bottom longline sets and caught 13,742 individuals encompassing 67 species. These catch data were coupled with a suite of potentially predictive variables and analyzed using boosted regression trees to generate habitat suitability maps. For coastal sharks, depth and distance from shore were the strongest predictors of distribution and relative abundance. Conversely, for red drum, surface velocity and surface temperatures were the strongest predictors. Surprisingly, the importance of the predictive factors varied little across seasons for both sharks and red drum, suggesting future efforts to characterize the dynamics of this community could take place any time of the year. While the primary function of fishery-independent surveys will always be the construction of indices of relative abundance, our findings demonstrate the value of these efforts beyond a time-series. As such, long-term fishery-independent monitoring should remain a priority, particularly in light of impending climate change.

14:45 Freshwater mussels (Unionidae) of the upper Tensas River, Northeast Louisiana

Steven G. George (USACE Engineer Research and Development Center)

W. Todd Slack (USACE Engineer Research and Development Center)

The Tensas River is the second largest tributary of the Black River that drains much of the Mississippi alluvial valley of northeastern Louisiana. During September 2021, a freshwater mussel survey was conducted along a 63 kilometer reach of the Tensas River from the headwaters near Lake Providence, LA to the Tensas River National Wildlife Refuge. A total of 242 individuals (194 live and 48 dead) representing 24 species were collected from seven sites. Five species representing 59% of the numerically dominant live mussels were: Pimpleback (*Cyclonaias pustulosa*), Bankclimber *(Plectomerus dombeyanus*), Mapleleaf (*Quadrula quadrula*), Threeridge (Amblema plicata) and Yellow Sandshell (*Lampilis teres*). Less abundant live mussels included eight species and comprised 36% relative abundance: Wabash Pigtoe (*Fusconaia flava*), Giant Floater (*Pyganodon grandis*), Bleufer (*Potamilus purpuratus*), Deertoe (*Truncilla truncata*), Wartyback (Cyclonaias nodulata), Washboard (Megalonaias nervosa), Fawnsfoot (*Truncilla donaciformis*) and Texas Lilliput (*Toxolasma texasiense*). Rare live mussel species represented 5% collectively and included Rock Pocketbook (*Arcidens confragosus*), Fragile Papershell (*Potamilus fragilis*) and White Heelsplitter (*Lasmigona complanata*). Recent dead mussels collected from three sites were Tapered Pondhorn, (*Uniomerus declivis*), Lilliput, (*Toxolasma parvum*), Flat Floater (*Utterbackiana suborbiculata*) and Threehorn Wartyback (*Obliquaria reflexa*). Relict mussel shells collected were Spike (*Eurynia dilatata*), Ebonyshell, (*Reginaia ebenus*) and Pyramid Pigtoe (*Pleurobema rubrum*). These three species are likely extirpated from the Tensas River as a result of combined impacts associated with flood control measures (channelization and weirs), deforestation and increased sedimentation. A comparison of our survey to previous historical studies suggests the freshwater mussel fauna in the upper Tensas has changed little in recent times. However a more extensive mussel survey of the entire drainage is needed to make an accurate comparison with previous survey efforts.

15:00 Notes on the current distribution and habitat of the Sicklefin Chub in the Lower Mississippi River

William T. Slack (U.S. Army Engineer Research and Development Center - Environmental Laboratory)

Steven G. George (U.S. Army Engineer Research and Development Center - Environmental Laboratory)

K. Jack Killgore (U.S. Army Engineer Research and Development Center Environmental - Laboratory)

Bradley R. Lewis (U.S. Army Engineer Research and Development Center - Environmental Laboratory)

Jay A. Collins (U.S. Army Engineer Research and Development Center - Environmental Laboratory)

The Sicklefin Chub, *Macrhybopsis meeki*, is a big-river minnow generally confined to the main channels of the Missouri and Mississippi rivers, occurring in swift, deep waters. Historically, only a few records of this species were noted in the Mississippi River downstream from the confluence with the Ohio River with individuals often considered as waifs from northern populations. The species has been petitioned in the past for listing by USFWS under the Endangered Species Act and is currently the focus of a Species Status Assessment (SSA). From 2005 through 2021, the ERDC Fish and Invertebrate Ecology Team has documented 28 specimens ranging 31-110 mm TL during 14 sampling events with the majority occurring within the Lower Mississippi River (LMR). Chub collections have been episodic ranging 1-3 per year during non-targeted sampling focused primarily on Pallid Sturgeon recruitment and LMR secondary channel monitoring projects. Four collections occurred in Missouri, five in Arkansas and five in Mississippi with the greatest concentrations of records occurring at Mhoon Bend (RM 686; Tunica Co., MS) and Old White River Chute (RM 595; Desha Co., AR). All specimens were taken with a 10’ Missouri Trawl, with one captured on a trotline while fishing for Pallid Sturgeon. Individuals were documented primarily over sand and gravel, occasionally with some mud in main channel dike fields and secondary channel habitats. Our samples have occurred primarily (64%) during the spring (Feb-May) at a water depth of 3.3 – 41.5 feet (mean: 20.7 ft.) with water temperature ranging 3.48-26.7 C (mean: 17.1 C). The Sicklefin Chub will continue to be an important target species as part of our ongoing research program in the LMR.

15:15 Spawning, Age, and Growth of Silver Carp in the Lower Mississippi River Valley

K Jack Killgore (USACE - Engineer Research and Development Center)

Todd Slack (USACE - Engineer Research and Development Center)

Steven George (USACE - Engineer Research and Development Center)

Bradley Lewis (USACE - Engineer Research and Development Center)

Jan Jeffrey Hoover (USACE - Engineer Research and Development Center (retired))

The Lower Mississippi River Valley (LMRV) is the principal center of abundance for invasive Silver Carp. The many flowing streams and rivers in the LMRV provide virtually unlimited spawning sites, and extensive backwaters and lakes provide stable rearing areas with high productivity. Long term monitoring of aquatic resources in the LMRV has included collection of pectoral fin rays for aging and observations of spawning habitat. Maximum age of Silver Carp females and males was 9 and 10 years, respectively. Von Bertalanffy growth curves for the LMRV exceeded regions of higher latitude. We compared mean Fulton's Condition Factor and mean age between mainstem Mississippi River and connected floodplain lakes using ANOVA. Condition Factor was significantly higher (>1.2) in the lakes for both sexes compared to the mainstem river (<1.2). Average age of females was 6 years ranging from 2 to 8 years, which was significantly higher than mainstem females and males in both habitats. A second outcome of our research and monitoring in the LMRV was direct observation of spawning Silver Carp. We recorded a major spawning event in the Tallahatchie River, Mississippi during April 2019. Aggregations of three or more Silver Carp constantly splashed and glided along the surface, and suddenly a caudal fin would emerge from the water for about 5–10 s and point straight up to the sky, at which point presumably eggs and milt were released. Peak spawning occurred during a rapid rise in river stage due to releases from upstream reservoirs that also caused a rapid rise in water temperature up 18°C–19°C, which is the reported preferred spawning temperature of the species. Although spawning activities were widespread, it appeared the majority of activities were in a sinuous river reach with complex hydraulic patterns.

15:30 Fecundity of the *Argulus flavescens* Ectoparasite on Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)

Katherine A. Wright (Division of Coastal Sciences, School of Ocean Science and Engineering, The University of Southern Mississippi)

Michael J. Andres (Division of Coastal Sciences, School of Ocean Science and Engineering, The University of Southern Mississippi)

Mark S. Peterson (Division of Coastal Sciences, School of Ocean Science and Engineering, The University of Southern Mississippi)

Gulf Sturgeon, *Acipenser oxyrinchus desotoi*, is a threatened species of anadromous fish that reside in rivers at holding sites during late Spring through early Fall and feed in marine waters during the winter. Little is known about the parasite community on Gulf Sturgeon. Argulus (Branchiura) are common ectoparasites of fishes, with no specific host preferences. Argulus infections can cause physical damage, behavioral changes, and can tax a host's immune system by increasing secondary infections. *Argulus flavescens* has been found on both Gulf Sturgeon and Flathead Catfish (*Pylodictis olivaris*) in the Pascagoula and Pearl Rivers. The purpose of this study is to examine the ecology, sex ratio, and fecundity of *Argulus flavescens* on Gulf Sturgeon in the Pascagoula and Pearl Rivers. From 2016 to 2021, fish were captured in gill nets and all ectoparasites were removed. Our study found that *A.* flavescens were more abundant on larger Gulf Sturgeon and in freshwater holding areas. The overall sex ratio of *A.* flavescens was skewed female (<U+03A7>2 = 16.797, $p < 0.001$) but did not significantly vary by river, holding location, or month sampled. These parasites tend to reach sexual maturity with a carapace length of around 2.42 mm; however, specimen found in the Pascagoula River seem to reach sexual maturity faster than Pearl River specimen. Fecundity of *A.* flavescens is highly correlated to their carapace length, but that fecundity did not vary by holding location or month sampled. No *A. flavescens* infestation was at a level that would suggest harm to the fish. Our preliminary study of Gulf Sturgeon parasites from the Suwannee River, FL, demonstrate *Argulus stizostethi* infects fish from that drainage rather than *A. flacescens*. Additional collections from other drainages east of Mobile Bay are needed to determine where the geographical divide is located.

15:45 An Overview of the Need for and Recent Development of Regional Fishermen Training Programs

AR Osowski (Mississippi State University Coastal Research and Extension Center)

KM Calhoun (Mississippi State University Coastal Research and Extension Center)

AE Jefferson (Mississippi State University Coastal Research and Extension Center)

JM Drymon (Mississippi State University Coastal Research and Extension Center)

Commercial fishing is a culturally and economically important industry in coastal regions across the United States. During the last 30 years, the average age of commercial fishermen has increased substantially. This trend is commonly referred to as the "graying of the fleet" and is attributed to a substantial decrease in the number of new commercial fishermen entering the industry. Ensuring the continuation of fishery participants remains challenging due to a variety of obstacles preventing entrance into the commercial fishing sector. Fishermen training programs can provide the infrastructure needed to encourage new entrants into this sector; however, no comprehensive lists of fishermen training programs previously existed, and few programs had been established in the state of Mississippi. Therefore, we collected information on existing commercial, recreational, and aquaculture-based fishermen training programs across the U.S. and designed a course that is applicable to all sectors and focuses on fisheries management, science, and sustainability. Our search results illustrate that while a wide variety of fishermen training programs exist, additional efforts are still needed in specific regions. Additionally, our pilot fisheries course was highly successful in communicating useful, yet understandable, information based on student feedback. These Extension activities lay the groundwork for current and future initiatives providing training, education, and outreach to the U.S. seafood sector, which will promote food security, economic prosperity, and job recruitment and retention across the Mississippi region.

09:00 What do we know about Red Snapper reproduction in Mississippi?

Nancy J. Brown-Peterson (USM Center for Fisheries Research and Development)

Red Snapper, *Lutjanus campechenus*, is an important commercial and recreational species throughout the northern Gulf of Mexico (GOM). While much is known regarding their reproduction in many areas of the GOM, information is lacking from Mississippi waters. To fill this data gap, Red Snapper were collected from 2016-2020 in three depth strata (< 20 m (shallow; 20-40 m (mid); >50 m (deep) and from three artificial structure types (oil platforms, artificial reefs, rigs-to-reefs) in offshore Mississippi waters using vertical long-lines. Females were macroscopically and histologically analyzed for reproductive parameters. Female Red Snapper achieve 50% sexual maturity at a small size (339.8 mm TL) and young age (1.78 years). Females were reproductively active from April-October, although peak spawning months were May-September. Red Snapper are batch spawners, and females are estimated to spawn an average of every 2.4-3.4 days during the reproductive season, with 21.8% of actively spawning females showing histological evidence of daily spawning. Fecundity increases with increasing fish size, with a mean (± se) batch fecundity of 42,654±7,391 for 93 females ranging from 287-774 mm TL; mean relative batch fecundity is 90.65±22.68 eggs/g ovary-free body weight. Depth is an important variable for predicting female reproductive parameters such as maturity, reproductive activity, potential spawning (measured as the percentage of vitellogenic oocytes), and recent spawning (presence of 24 h postovulatory follicles), whereas structure type is unimportant for predicting Red Snapper reproductive parameters. However, structure type is somewhat important when modeling differences in length or age by maturity status, with immature females on artificial reefs older than those on platforms while both length and age of mature females is greater on rigs-to-reefs than artificial reefs or platforms. Our results suggest that reproductively active females are more likely captured in deeper waters, which should be considered when managing Mississippi GOM Red Snapper populations.

09:15 Keys to successful management of giant salvinia (*Salvinia molesta*)

Ryan R Jones

Giant salvinia (*Salvinia molesta*) is an exotic, invasive aquatic plant from Brazil which can have devastating ecological and socioeconomic impacts if not managed properly. The free-floating aquatic fern can outcompete and suppress growth of native vegetation while degrading water quality and fish habitat. Giant salvinia can double in number and biomass in less than three days under optimal conditions. Once identified, a rapid and aggressive response is imperative for any chance of eradication. Integrated management techniques include recreational access closures, floating barrier deployment, water level management, herbicide applications, physical removal, and prescribed fire while monitoring from boats, on-foot, and using drone imagery.

09:30 Gulf Sturgeon movement and travel patterns in the lower Pascagoula River in the main distributaries and adjacent smaller tributaries

Kasea L. Price (Division of Coastal Sciences, The University of Southern Mississippi, Ocean Springs, MS 39564)

Elizabeth M. Greenheck (Division of Coastal Sciences, The University of Southern Mississippi, Ocean Springs, MS 39564)

Mark S. Peterson (Division of Coastal Sciences, The University of Southern Mississippi, Ocean Springs, MS 39564)

Paul O. Grammer (Division of Coastal Sciences, The University of Southern Mississippi, Ocean Springs, MS 39564)

Michael J. Andres (Division of Coastal Sciences, The University of Southern Mississippi, Ocean Springs, MS 39564)

Gulf Sturgeon, *Acipenser oxyrinchus desotoi*, is an anadromous species found in the northern Gulf of Mexico and is federally listed as threatened. Gulf Sturgeon comprising the western population units (those natal to the Pearl and Pascagoula rivers) have smaller population sizes than those comprising the eastern population units (river systems east of Mobile Bay). One possible reason for this could be habitat alteration with sills in the lower Pearl River although no river impediment is located along the main stem of the Pascagoula River. However, the eastern distributary of the lower Pascagoula River is partially altered, and maintenance dredged, which may impact overwinter survival. Objectives for this research are to determine patterns of Gulf Sturgeon movement in the lower Pascagoula River and determine differential occupancy throughout this system. We tracked Gulf Sturgeon movement using telemetry receivers placed along both major distributaries and smaller tributaries from September 2020 and to January 2022. During that time, 159 individual Gulf Sturgeon were detected in the Lower Pascagoula River. Of those, 54 were juveniles, 60 were subadults, and 45 were adults. A total of 32 individuals were detected in the Escatawpa River in the east, during this study period, 7 juveniles, 12 subadults, and 13 adults. As for Bluff Creek in the west, 136 individuals were detected at the mouth. Only 17 of them were detected further into Bluff Creek. 9 of those individuals were juveniles, 6 were subadults, and 2 were adults. After weighting for receiver effort, we saw Gulf Sturgeon used the western distributary more than the eastern distributary in all months, except for September and January. February had very few overall detections. Continued monitoring of Gulf Sturgeon movement will help inform distributary preference in the Lower Pascagoula River.

09:45 Shark diversity across three regions of the Chandeleur Island chain found in historic longline survey data

Angie Hoover (The University of Southern Mississippi CFRD)

Jeremy Higgs (The University of Southern Mississippi CFRD)

Jill Hendon (The University of Southern Mississippi CFRD)

The Chandeleur Island chain is a natural barrier island formation off the east coast of Louisiana and due to the north-south orientation of the chain, a protected estuary is formed between the islands and the mainland. Though the Chandeleur Island chain is known to support shark populations, there is considerable environmental variability associated within the region, thereby obscuring the specific usage by various species and life stages. The western, estuarine area, the Chandeleur Sound, is relatively shallow (mean of 3.6m), and more subject to freshwater runoff from terrestrial sources making it generally lower in salinity and higher in nutrients. This is evidenced by the rich seagrass beds present on the west side of the northern islands, which support diverse communities, as well as ample habitat conducive to a shark nursery ground. In contrast, the east side of the islands does not support seagrass beds, generally has a higher salinity, and drops off to depths greater than 6.0m within a couple of kilometers. The southern end of the islands (south of Grand Gosier islands) may be more subject to both terrestrial runoff and influx of gulf waters. The University of Southern Mississippi's Center for Fisheries Research and Development (CFRD) sampled the northern Chandeleur Sound by means of a standardized Southeast Area Monitoring and Assessment bottom longline survey from 2009-2011. In 2015 this effort expanded to include the eastern and southern portions of the Chandeleur Islands. Species composition, encounter rate (CPUE), sex ratio, and life stage were compared among the three designated regions to determine how these groups are using the Chandeleur region.

Abstracts for Poster Presentations

(Alphabetical Order by last name of first author)

Analyzing the use of fyke nets for Southern Flounder (*Paralichthys lethostigma*) along the Mississippi Gulf Coast

Christopher Graham (Mississippi Department of Marine Resources)

Joshua Waters (Mississippi Department of Marine Resources)

Jennifer Green (Mississippi Department of Marine Resources)

Trevor Moncrief (Mississippi Department of Marine Resources)

Matthew Hill (Mississippi Department of Marine Resources)

Southern Flounder (*Paralichthys lethostigma*) is an important finfish species for both recreational and commercial fishermen along the Mississippi Gulf Coast. Due to the selectivity of current fishery-independent surveys, this species has been inconsistently sampled resulting in difficulties determining the species relative abundance each year. To lessen the extent of these inconsistencies, the goals of this project are to 1) evaluate the effectiveness of fyke net sampling, 2) analyze and compare data collected from 2018-2021, 3) establish additional sites in the Pascagoula drainage, and 4) assist with long-term relative abundance monitoring through acoustic tagging. Sampling sites in Pascagoula Bay, Pascagoula USCG Island, Belle Fontaine, Davis Bayou, and Deer Island were chosen based on the amount of ideal habitat and the sampling accessibility. Sampling occurred from May to November in two-week intervals with a 48-hour soak time. A total of 244 Southern Flounder have been caught during 53 sampling events from 2018 to 2021. The observed size distribution from 2018 to 2021 was 194 mm – 482 mm total length (TL). Observed weight ranged from 88 g – 1547 g, with an average weight of 481 g. Annual total catch per location varies from 2018 to 2021. Results of this study will aid in informing future stock assessments and management recommendations for Southern Flounder in the Mississippi Sound.

Analyzing Reef Fish Data from a Multi-year For-hire Vessel Observer Program

Austin Burmaster (Mississippi Department of Marine Resources)

Wade Hardy (Mississippi Department of Marine Resources)

Trevor Moncrief (Mississippi Department of Marine Resources)

Matthew Hill (Mississippi Department of Marine Resources)

Observer programs have been implemented across the country as a way to collect data used to monitor both state and federal fisheries. The Mississippi Department of Marine Resources (MDMR), along with funding through the National Fish and Wildlife Foundation (NFWF), has carried out a multi-year study to more accurately assess the state's reef fish populations. The program placed at-sea-observers on charter for-hire trips in an effort to document fishing effort, landings, and discards of the state's reef fish populations. Since its development in 2016, a total of 12 vessels have participated, resulting in a total of 100 trips throughout the program's six-year sampling period. Trips were randomly assigned to vessels across the duration of both state and federal red snapper seasons allowing for 18 trips each year with the exception of the years 2017 and 2020, which had 19 and 9 trips, respectively. Throughout these trips, observers collected at sea data including fish length, number of discards, degree of barotrauma, and condition upon release from the 1,410 fish captured. Supplementary bio-sampling data, including length, weight, sex, and otolith collection, were also obtained from the 1,293 harvested fish upon the vessel's return to the harbor. During the program's six-year sampling period, an average length of 21.47 inches was found for harvested snapper, while the average discard length was 14.54 inches. The data collected from this program, alongside other fishery-dependent data, has allowed MDMR to determine accurate harvest rates, release mortality estimates, discard rates, and management strategies for the state's reef fish population.

Program for Collection of Data on Blue Crab Harvest in Mississippi

Lillian Collins (Center for Fisheries Research and Development, The University of Southern Mississippi)

Harriet Perry (Center for Fisheries Research and Development, The University of Southern Mississippi)

Use of commercial landings to detect long-term trends in abundance in blue crabs, Callinectes sapidus, entering the fishery in Mississippi is complicated by the adoption of management measures that limited harvest of egg-bearing females and closed inland bays to commercial crab fishing. Additionally, Mississippi's processing capacity has declined, and a portion of the crabs landed in Mississippi are trucked to neighboring states for processing. This study was designed to address the need for fishery-dependent data on commercial harvest of blue crabs and used a fishermen/biologist field approach to determine effort, catch-per-unit-effort (CPUE), size and sex composition of the harvest, and presence of parasites and epizoans. Biologists accompanied crab fishermen twice monthly to obtain data on the harvest from each trap harvest and collected 20 crabs from each trip for more detailed laboratory analysis. Fishermen were selected to represent the western, central, and eastern Mississippi Sound. Data for this summary are based on 72,422 trap pulls from the survey period, 2007-2019. Overall, females dominated the catch making up more than 65 percent of the total surveyed harvest. On average, carapace width was consistent across each of the three sampling regions for the different sex and maturity stages, showing the most variation in immature females. The average carapace width of legal mature females was larger than that of the legal males in all regions and in each individual year. Of the crabs that were brought back to the lab for further study, *Carcinonemertes carcinophila* was the most commonly observed parasite/epizoan. When looking at gonadal condition of females seasonally, the majority of individuals examined in the Fall had been recently mated, and in the Spring and Summer most of the females were in the stage between their first and final ovulation.

Microbial Communities of Sargassum Habitat and Associated Microplastics Influence the Gut Microbial Community of Juvenile Gray Triggerfish

Olivia Lestrade (The University of Southern Mississippi, Center for Fisheries Research and Development)

Frank Hernandez (The University of Southern Mississippi, School of Ocean Science and Engineering, Department of Coastal Sciences)

Robert Griffitt (The University of Southern Mississippi, School of Ocean Science and Engineering, Department of Coastal Sciences)

Leila Hamdan (The University of Southern Mississippi, School of Ocean Science and Engineering, Department of Coastal Sciences)

Microplastics and Sargassum (a nursery habitat for juvenile fishes) aggregate in surface waters of the Gulf of Mexico via similar surface oceanic processes. We have found that microplastics are in higher concentrations within Sargassum compared to the adjacent open water and that Sargassum associated juvenile fishes are ingesting microplastics. Microplastics provide a new substrate for marine microbe colonization. Fish gut microbial communities are important in digestive and immune processes. Because fish gut microbial communities develop during early life history stages, there is potential for a new source of microbes from microplastics to influence juvenile fish gut flora from ingestion. This study examined relationships among the microbial communities of co-occurring juvenile Gray Triggerfish (gut flora), microplastics, Sargassum, and ambient seawater. DNA was extracted from each sample type and the 16S rRNA genes were sequenced to characterize each associated microbial community. Microplastics, Sargassum, and ambient seawater had higher microbial diversity and richness than Gray Triggerfish guts, and each associated microbial community was defined by specific operational taxonomic units. Our results suggest, Gray Triggerfish gut flora was sourced from microplastics (10.3%), Sargassum (6.9%), and seawater (16.4%) microbial communities. This study provides the first quantitative estimates of Sargassum-associated microplastic and Gray Triggerfish gut microbial communities, and provides evidence that the gut flora of developing fishes are being influenced by microplastic microbial communities.

Results of the Remote Oyster Setting 2021 Medium Scale Production Season

Ellen Coffin (Mississippi Department of Marine Resources)

The Mississippi Department of Marine Resources (MDMR) is in Phase I of the RESTORE Council-funded Remote Oyster Setting Facility Project. Remote setting is the process of taking oyster larvae and placing it in a system where it is protected from predators. The larvae are given substrate to settle on, ample food, and beneficial water quality conditions to ensure optimum survival. The purpose of the Remote Oyster Setting Facility Project is to provide a facility that will restore Mississippi's decimated oyster reefs at a faster rate than could be achieved in the wild. Not only will this benefit oyster reefs, but it will also aid the oyster industry and increase ecosystem services performed by the oyster reefs themselves such as providing a nursery for other important fisheries. During Phase I, planning activities assess the overall feasibility of the facility and determine infrastructure layout, ongoing operational and maintenance costs, setting efficiencies, and production milestones. To better plan and facilitate a successful future for the Remote Oyster Setting Project, MDMR was able to complete preliminary medium-scale tests in 2021. Throughout the medium-scale test, MDMR acquired 98 million eyed larvae from the University of Southern Mississippi and Auburn University Shellfish Laboratory. These larvae were set on oyster shells using natural seawater from Gulfport Harbor. Over a five-month period, 11,703,819 spat-on-shell oysters were produced resulting in a larva setting efficiency of 16.18% over the course of six individual production cycles. The average size of the oysters planted was 2.74mm. In addition to oyster setting successes, MDMR was able to confirm the feasibility of the sites' water quality parameters. Salinity values ranged from 3.8ppt to a maximum of 27.0ppt with an average salinity during production runs of 13.2 ppt. Overall, 46.8 cubic yards of spat-on-shell was deployed in Biloxi Bay on existing MDMR cultch plants.

Gulf Sturgeon, *Acipenser oxyrynchus desitoi*, spawning movement and site use of the Pascagoula River system

Eric R. Haffey (University of Southern Mississippi)

Michael J. Andres (University of Southern Mississippi)

Mark S. Peterson (University of Southern Mississippi)

William T. Slack (US Army Corp of Engineers)

Paul O. Grammer (University of Southern Mississippi)

Mississippi contains spawning habitat for Gulf Sturgeon natal to the Pearl and Pascagoula rivers; however, little is known about their movement and use of the upper reaches of these systems. Developing an understanding of spawning related movements for sturgeon from both of these systems has been outlined as a recovery need. Our objective is to determine the number of individuals making spawning migrations for the Pascagoula River, determine their preferred spawning habitats in those systems, and use drift nets to attempt to verify spawning as well as inform habitat characteristics. An array of telemetry receivers were deployed in the Pascagoula, Leaf, and Bouie rivers to determine timing of presumed spawning runs and determine use around a previously identified spawning site in the lower Bouie River. Drift net samples were collected during late spring through early summer to determine if spawning had occurred above and below a sill located at the historically known spawning location. From 2017–2021, Gulf Sturgeon initiated spawning runs on about ordinal day 76 (SD +/- 17 days) –ordinal day 108 (SD +/- 28 days). A total of 36 individuals have attributed to making spawning runs, with 25 of those returning to the known spawning site on the Bouie River. Number of individuals from 2017–2021 making spawning runs ranged from 7–17 individuals. Of those individuals, 16 were seen to make spawning runs in multiple years, and 11 of those individuals made spawning runs in sequential years suggesting they are male. No larval sturgeon or sturgeon eggs were present in June drift net samples in the Bouie River, suggesting post-larval sturgeon have already left the site. Potential prey items captured in drift net collections were similar above (mean CPUE= 33.5) and below (mean CPUE = 43.8; U= 346, p=0.60) the sill, suggesting similar prey availability.

Multiple new records of the ragged-tooth shark, Odontaspis ferox, from the western North Atlantic Ocean

Jeremy M. Higgs (The University of Southern Mississippi, Center for Fisheries Research and Development)

Eric R. Hoffmayer (National Marine Fisheries Service, Southeast Fisheries Science Center, Mississippi Laboratories)

William B. Driggers III (National Marine Fisheries Service, Southeast Fisheries Science Center, Mississippi Laboratories)

Christian M. Jones (National Marine Fisheries Service, Southeast Fisheries Science Center, Mississippi Laboratories)

Jill M. Hendon (The University of Southern Mississippi, Center for Fisheries Research and Development)

The ragged-tooth shark, Odontaspis ferox, is a circumglobal species inhabiting subtropical and tropical marine waters and is often associated with continental and insular shelves. Although the range for this species is expansive, it is driven by infrequent, isolated observations from disparate regions, resulting in a paucity of biological data. Within the western North Atlantic Ocean there have only been a total of 13 observations of the ragged-tooth shark since first reported in 1989. Through collaboration with recreational and commercial stakeholders we report four new records of the ragged-tooth shark, from the western North Atlantic Ocean and provide additional biological data lacking from this region. Two specimens of unknown sex were caught in the recreational swordfish, Xiphias gladius, fishery in the northern Gulf of Mexico (~225 and ~250 cm total length (TL)), a mature male was caught in the South Atlantic Bight (~200 cm TL) by an angler targeting barrelfish, *Hyperoglyphe perciformis*, and another mature male was caught in the Sargasso Sea off Bermuda (~275 cm TL) by a commercial fisher targeting Atlantic wreckfish, Polyprion americanus. All four specimens were incidentally caught on rod-and-reel and released alive. The Gulf of Mexico and South Atlantic Bight specimens reported herein contribute to the limited number of ragged-tooth shark interactions in these regions while the observation in Bermuda is the first documented record for this locality. These new records highlight the importance of fostering stakeholder collaborations as fishery dependent observations can help provide a better biological and ecological insight of rare and uncommon species.

Simple models to quickly estimate the probable range of data-limited riverine fishes

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Evan C. Boone (US Fish and Wildlife Service, Lower Mississippi River Fish and Wildlife Conservation Office, Tupelo, MS)

Species distribution models provide biologists with insight into species range, habitat niche, and potential areas of suitable habitat, but require significant data, training, and time requirements to obtain reliable results. Alternatively, ad hoc inferences from sparse sighting records leave biologists to face management decisions with high uncertainty. Simple predictive models can fill the gap between the alternatives, such as the approach for riverine fishes developed by Jaric et al. (2012). However, there are drawbacks to this method, namely in the reliability of coverage in the maximum probable range estimate (type I error) and positive bias in the probable range endpoint when sighting distributions are non-uniform (e.g., the distance between sightings decreases further upstream). Herein, two additional extinction estimators that are robust to non-uniformity of sighting distributions, the estimators of Jaric and Ebenhard (2010) and Roberts and Solow (2003), were adapted and compared to the method of Jaric et al. (2012) using simulations. Demonstrations of Jaric and Ebenhard's (2010) and Roberts and Solow's (2003) estimators are made with Gulf (of Mexico) Coast walleye (*Sander vitreus*) and silver carp (*Hypophthalmichthys molitrix*). The estimator of Jaric and Ebenhard's (2010) showed the least bias and variance in bias for the probable range endpoint. Roberts and Solow's (2003) estimator best balanced type I and type II errors in the maximum probable range estimate. The application of each of these estimators demonstrate how sampling can be planned based on available effort (Gulf Coast walleye) and where targeted early detection sampling should be conducted (silver carp). The three estimators examined here provide biologists with a suite of options to quickly assess the range of data-limited riverine fish species over a wide-range of distributional, scale, and sampling scenarios.

Assessing the efficacy of a barrier assessment method and the connectivity of headwater fish: An experimental approach

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The connectivity of populations particularly in dendritic networks is essential for the retention of genetic diversity, ample habitat, access to resources, and overall ecosystem function. Riverine ecosystems are dendritic networks which have become increasingly threatened by fragmentation due to in-stream barriers. Within riverine networks, culverts are the most common type of barrier to aquatic organismal passage (AOP). Studies on the effect of culverts on fish connectivity have been biased towards economically important species and primarily consist of small scale mark-recapture and large scale modeling approaches. Barrier surveys have been developed to rapidly assess culverts for AOP, but consistent support and studies investigating the efficacy of these surveys are lacking. Additionally, more information is needed to understand the connectivity of small-bodied headwater fish which account for much of the freshwater biodiversity in the southeastern U.S. The goal of this study was to 1) use a novel experimental approach to assess the efficacy of a common barrier survey, and 2) to determine the connectivity of stream fish within the range of the federally threatened Louisiana Pearlshell Mussel (*Margaritifera hembeli*). We conducted SARP (Southeast Aquatic Resource Partnership) barrier assessments at all accessible sites across two watersheds. 6 sites with varying SARP AOP scores were selected to conduct mark-recapture studies over a 2 year study period. Of the 49 culverts surveyed, 11 (22%) were identified as moderate barriers and 9 (18%) were identified as significant or severe. Initial marking survey's resulted in the capture and marking of 3,162 fish across 29 species. The mean recapture percentage was relatively high (11.1%), but varied depending on the site. Further recapture samples are needed to make conclusions, but preliminary recapture results reflect varying AOP across the 6 sites.

Reproductive timing in Percina aurora and other Percina sp in the Pascagoula River Watershed

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Understanding the timing, duration and effort put into reproduction is vital to successful management of any species. Within the Southeastern US region, human populations continue to put pressure on aquatic ecosystems and the resident species. Darters (Percidae) represent a large proportion of the freshwater fish diversity in the region. However, for some species age, growth, reproduction timing, effort and ecology remain poorly understood. The Pearl Darter, *Percina aurora*, has been recently listed as threatened due to its contracting range, likely due to anthropogenic pressure on these systems. Little is known of Pearl Darter life history as few reproductive adults have been captured. Thus, there remains a major knowledge gap in terms of the life history and reproductive ecology of this species. The purpose of this project was to examine the age, growth, and reproductive ecology of Percina aurora and other coexisting Percina species in the Pascagoula River basin. To do this, darters were sampled and their gonadosomatic index (GSI) was examined over time to better understand the reproductive effort and timing. Percina species collected included *P. aurora* (Pearl Darter), *P. vigil* (Saddleback Darter), *P. sciera* (Dusky Darter) and *P. suttkusi* (Gulf Logperch). The goal was to find the spawning window of each species to determine if there is overlap with the Pearl Darter. Overlap could lead to larval competition, placing another stressor on the threatened Pearl Darter. To better understand the age and growth of this species, we modeled growth (Von Bertalanffy) based on size measurements of previously collected specimens.

Cryopreservation of Fish and Shellfish Gametes for Enhanced Aquaculture Production

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The process of preserving cells or tissues by storing at low temperatures is known as cryopreservation. Cryopreservation of gametes is one of the most important off-site conservations of genetic material and has been commonly practiced in aquaculture and fisheries management sector. Currently, gametes or other cell and tissues from more than 200 fish species are successfully cryopreserved. However, cryopreservation of finfish ova and embryos has not been relatively successful as that of fish sperms. Cryopreservation of shellfish is one area where less research effort has been made with limited success. Despite the availability of successful sperm cryopreservation protocol for several fish species, usage of this practice at commercial level for fish seed production has been limited. High degree of variability in the procedural requirements and average success with hatching and survival rate among and within species are considered as the limiting factor in its utilization. This review provides a comprehensive overview of various aspects of milt cryopreservation of aquaculture species, including mollusk and crustacean gametes, biobanks, cryopreservation of cells of somatic, embryonic, and germinal origin, different cryoprotectants, factors influencing the preservation and revival of gametes, as well as benefits and challenges of cryopreservation.

Seasonal movements of Silver Carp (*Hypophthalmichthys molitrix*) in a hydrologically regulated oxbow network

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Silver Carp (*Hypophthalmichthys molitrix*) is an invasive planktivorous fish that has spread throughout the Mississippi River basin, and jeopardizes native species and recreational fisheries. Existing infrastructure such as water-control structures can limit fish passage, and therefore, potentially restrict the spread of invasive carps, including Silver Carp. Our goal is to examine environmental variables coinciding with Silver Carp movements through water-control structures into a recreationally important oxbow (Eagle Lake, LA, MS) from adjacent waterbodies. Using active and passive acoustic tracking, we will monitor seasonal movements of 80 Silver Carp through two water-control structures separating four waterbodies: Yazoo River, Steele Bayou, Muddy Bayou, and Eagle Lake. We will deploy remote data loggers to record water temperatures and water levels in each waterbody, and use existing river gauges to determine bi-directional movements of water through water-control structures. Using multi-state models, we will examine whether Silver Carp movements coincide with rising water levels and temperatures, and whether movement rates vary by sex and fish length. This research could inform how fisheries and water managers might adapt operations of water-control structures to limit movements by Silver Carp into recreationally important waterbodies.

Reexamining the Distribution of *Labidesthes* Across Mississippi

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The *Labidesthes* species complex is widely distributed throughout the freshwaters of the Midwestern and Southeastern United States. Prior to the 1960s, the genus *Labidesthes* was represented by the Brook Silverside (*Labidesthes sicculus*) and the Hardy Silverside (*Labidesthes vanhyningi*), but was synonymized under L. sicculus by Bailey et al in 1954. In 2015, Werneke and Armbruster re-described the *Labidesthes* complex elevating *L. vanhyningi* based on several phenotypic characteristics. *Labidesthes vanhyningi* was distinguished from *L. sicculus* by the presence of an anterolateral process of the post temporal that is longer than it is wide, an anteriorly broadening midlateral stripe (vs. anteriorly thinning), and a ratio of thoracic length to abdominal length of less than 2 (vs. > 2). Additionally, Werneke and Armbruster established that *L. vanhyningi* was found to primarily inhabit coastal drainages in the Southeastern United States, while *L. sicculus* was found to occur further inland throughout Southeastern and Midwestern states. However, apart from within the Tombigbee and Tennessee river drainages, both species were found to be sympatric throughout Mississippi. Previous ichthyologists at the Mississippi Museum of Natural Science had not differentiated between the two *Labidesthes* species and had cataloged all *Labidesthes* as *L. sicculus,* warranting a re-identification of all *Labidesthes* specimens to better understand the distribution of *Labidesthes* found throughout the state. We re-identified 14244 specimens from 1143 lots using methods established by Werneke and Armbruster, which resulted in 732/1143 (64%) of the MMNS lots re-identified as *L. vanhyningi*. Our findings support that *L. vanhyningi* is the prevalent species in Gulf of Mexico drainages and suggest a recent species exchange via the Tennessee-Tombigbee Waterway. This project not only updates the MMNS ichthyological collection to reflect contemporary taxonomy, but also adds to our knowledge of the distribution of the two species within the state of Mississippi.

Comparative coastal habitat use of three migratory species within Mississippi Sound prior to oyster reef construction

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Mark S. Peterson (University of Southern Mississippi)

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Oyster populations are declining globally with the coastal waters of Mississippi having experienced drastic decline. Little is known about the impacts oyster reef creation has on non-reef resident fishes, but such restoration is thought to be beneficial. To effectively determine the consequences of oyster reef creation on non-resident, we should establish baseline use and movements of fishes across habitat mosaics within the estuarine landscape so that post-restoration impacts can be understood. We describe habitat use prior to an oyster reef creation project for three species with variable feeding ecologies but which may be affected by such restoration; namely Gulf Sturgeon (*Acipenser oxyrinchus desotoi*), Sheepshead (*Archosargus probatocephalus*), and Black Drum (*Pogonias cromis*). Specifically, we will quantify the amount of time each species spends associated with marsh edge, open bottom, piling, rubble reef, and natural reef habitats within Mississippi Sound using acoustic telemetry. Each species did not occupy habitats uniformly and specific habitat types were more commonly used than others. Gulf Sturgeon had the most detections in natural reef habitats with 64% of all their detections followed by piling habitats with 18% of their total detections. Sheepshead had the largest proportion of detections at piling habitats with 83% followed by natural reef habitats with 13%. Black Drum were most detected in marsh edge habitats with 61% of all detections followed by piling habitats with 38%. Although tagging efforts for each species was variable, Gulf Sturgeon displayed a wider range of habitat use but favor natural reef habitat over the other species. Sheepshead favored vertically structured habitats whereas Black Drum were more edge associated. Our study will help quantify changes in habitat use in relation to oyster reef construction and provide data on potential benefits or unintended consequences of such restoration.

Registered Participants

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Candidates for Executive Committee

President Elect

Jeremy Higgs is the Research Manager for the Center for Fisheries Research and Development at The University of Southern Mississippi. He received his B.S. in Marine Biology with a minor in Environmental Studies from Southwestern College and a M.S. in Coastal Sciences from The University of Southern Mississippi. Currently, his work focuses on the life history, distribution, and movement of highly migratory species in the Gulf of Mexico. Jeremy is also the lab instructor for the Elasmobranch Biology field course for USM's Summer Field Program and provides mentorship for undergraduate and graduate students. Jeremy has been an active AFS member (National, Southern Division, and Mississippi Chapter) since 2011 and has been recognized as a Certified Fisheries Professional since 2020. He has served two terms as Secretary Treasurer of the Mississippi Chapter (2016-2018 and 2018-2020); Deputy Committee Chair, Committee Chair, and Past Committee Chair for the International Fisheries Section Fellow Award (2015-2018); and as President of the USM Student Subunit (2013-2014). Jeremy looks forward to continuing to serve AFS as he continues his career.

Candidates for Executive Committee

President Elect

Dr. Mike Andres is currently an Assistant Research Professor in the Division of Coastal Sciences at the University of Southern Mississippi. His research is largely focused around migratory fish management, conservation, ecology, and their parasites. Mike has been an AFS member since 2011, was active in the USM subunit while a student and has been active with MSAFS in various forms from meeting socials and coordination to student judging. Mike received his B.S. in Marine Biology from Texas A&M University at Galveston and his PhD from the University of Southern Mississippi in 2015. He currently teaches Marine Ichthyology at USM and has also taught Marine Fisheries Field and Lab Techniques and Marine Biology. His current research focusses on addressing data gaps in Gulf Sturgeon conservation and management, using parasites as biological tags for trophic interactions and movements of migratory fish, and the ecology of recreationally and economically important fish and shellfish species in relation to habitat restoration projects (e.g., living shorelines and oyster reefs). He has been an active participant in fisheries outreach events through USM and the Mississippi Museum of Natural Sciences and collaborates with both state (MDMR and MDWFP) and federal (USACE, USFWS, NOAA) agencies.

Treasurer

Olivia Lestrade is a research technician for the Center for Fisheries Research and Development at The University of Southern Mississippi. She received her B.S. (2013) in Marine Biology from The University of Southern Mississippi and recently graduated with a M.S. (2020) in Coastal Sciences from The University of Southern Mississippi. Her previous work has focused on the ecology and biology of early life history fishes in the Gulf of Mexico. Currently, her work focuses on the ecology and biology of coastal adult fishes in the Mississippi sound and bays. Olivia has been an active AFS member(National, Early life history section, and Mississippi chapter) since 2017. She has attended and presented at both national and state AFS meetings (2018, 2019) and international larval fish meetings (2017, 2019, 2020). As a master's student she served as the AFS student subunit president (2018-2019) and was an active member in the subunit. Olivia looks forward to continuing her participation in AFS and being able to serve in the AFS community.

AFS Code of Conduct

American Fisheries Society (AFS) meetings are among the most respected scientific meetings of fisheries professionals in the natural resource scientific community. AFS values the diversity of views, expertise, opinions, backgrounds, and experiences reflected among all attendees, and is committed to providing a safe, productive, and welcoming environment for all meeting participants and AFS staff. All participants, including, but not limited to, attendees, speakers, volunteers, exhibitors, staff, service providers, and others, are expected to abide by this Meetings Code of Conduct. This Code of Conduct applies to all AFS meeting-related events, including those sponsored by organizations other than AFS but held in conjunction with AFS events, in public or private facilities.

Expected Behaviors:

- Treat all participants, attendees, AFS staff, and vendors with respect and consideration, valuing a diversity of views and opinions, and critiquing ideas rather than individuals.
- Refrain from demeaning, discriminatory, or harassing behavior and speech directed toward other attendees, participants, AFS staff, and suppliers/vendors.
- Be mindful of your surroundings and of your fellow participants. Alert AFS staff or venue event staff if you notice a dangerous situation or someone in distress.
- Respect the rules and policies of the meeting venue, hotels, AFS-contracted facility, or any other venue. To foster a welcoming environment, assist AFS members with impaired physical or cognitive abilities, if necessary.

Unacceptable Behaviors:

Harassment, intimidation, or discrimination in any form is unacceptable. Harassment includes speech or behavior that is not welcome or is personally offensive. Behavior that is acceptable to one person may not be acceptable to another, so use discretion to be sure respect is communicated. Harassment intended in a joking manner still constitutes unacceptable behavior. Regardless of your intent, if you are advised directly or by another party that some aspect of your speech or behavior at an AFS meeting is harassment, you are expected to stop engaging in such speech or behavior.

Do not physically or verbally abuse any attendee, speaker, volunteer, exhibitor, AFS staff member, service provider, or other meeting guest.

Examples of unacceptable behavior include, but are not limited to, unwelcome or offensive verbal comments related to age, appearance, or body size, employment or military status, ethnicity, gender identity and expression, individual lifestyle, marital status, national origin, physical or cognitive ability, political affiliation, sexual orientation, race, or religion. Harassment can also include the use of sexual and/or discriminatory images in public spaces or in presentations; deliberate intimidation; stalking; following; harassing photography or recording; sustained disruption of talks or other events; bullying behavior; inappropriate physical contact; and unwanted sexual attention.

Appropriate and responsible personal use of photographs or posts to social media of another individual's oral presentation, poster, or likeness is acceptable unless permission is specifically denied by the individual. Do not disrupt talks at oral or poster session or activities in the exhibit hall or at other events organized by AFS at the meeting venue, hotels, or other AFS-contracted facilities.

Any retaliation against participants for reporting unacceptable behavior is unacceptable. Like harassment or discrimination, retaliation against reporting poor behavior will be subject to consequences.

Reporting Unacceptable Behavior:

Anyone experiencing or witnessing behavior that constitutes an immediate or serious threat to public safety at any time should contact local law enforcement (by calling 911) and immediately notifying facility security without delay.

If you are not in immediate danger but feel that you are the subject of unacceptable behavior, you are encouraged to file a formal complaint to the AFS Ethics and Professional Conduct Committee and/or an AFS officer or the AFS Executive Director which will then be forwarded to the Ethics and Professional Conduct Committee for assessment.

Consequences:

Anyone requested to stop unacceptable behavior is expected to comply immediately.

Consequences to unacceptable behavior will be determined by the AFS Ethics and Professional Conduct Committee in conjunction with AFS officers and the AFS Executive Director.

Consequences may include one or more of the following actions:

- Dismissal from the meeting without refund.
- Reporting to your agency.
- Exclusion from any future AFS (sub unit/chapter/division) meetings for five years.
- Revoke of AFS membership without the opportunity for renewal for five years.
- If the offense is criminal, local law enforcement will be contacted.