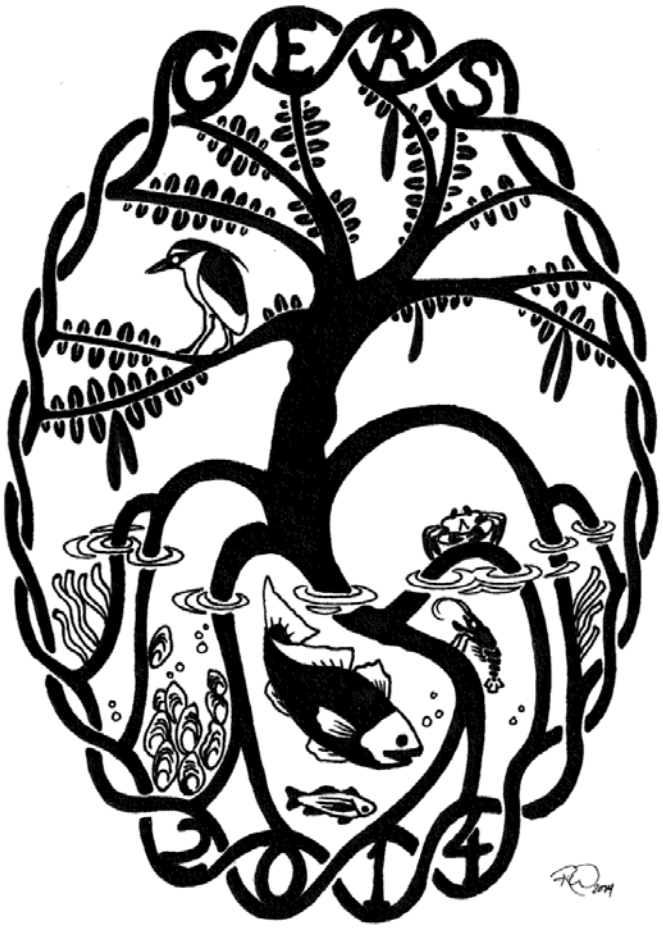
GULF ESTUARINE RESEARCH SOCIETY

2014 MEETING



University of Texas Marine Science Institute
Port Aransas, Texas
October 30 - 31, 2014

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THANK YOU!

We would like to thank sponsors of the GERS 2014 Biennial Meeting. We are honored to have such notable sponsors for this year's meeting. Their generous contributions have helped ensure that this year's GERS Biennial Meeting will continue the long-standing tradition of bringing together the foremost scientists, researchers, and students from universities, agencies and research labs along the Gulf coast.

Meeting Planning Committee

Ken Dunton, Conference Chair
Katie Swanson, Overall Program Coordinator
Christina Bonsell, Scientific Program Chair
John Mohan, Social Events Co-Chair
Meredith Evans, Social Events Co-Chair
Sara Wilson, Abstract and Program Book Chair
Jim McClelland, Student Awards Chair
Claire Griffin, Poster Session Chair
Tracy Harvey, Student Volunteer Coordinator

Volunteers

Elizabeth Brown
Matt Dzaugis
Wayne Hall
Carrie Harris
Melinda Martinez
Mark McKay
Gene Oh
Matt Seeley
Kiley Seitz

About the Gulf Estuarine Research Society

The Gulf Estuarine Research Society (GERS) is one of 7 regionally based Affiliate Societies of the Coastal and Estuarine Research Federation (CERF). GERS is a not for profit educational organization for people interested in estuarine and coastal issues centering on the Gulf of Mexico. The fundamental goal is to promote research in the Gulf of Mexico. GERS is a very active research society with a membership of scientists, researchers, and students from universities, agencies and research labs along the Gulf coast.

At its scientific meetings, GERS also encourages students to present papers on their research in marine related areas. Awards are presented at each meeting for the best student papers. These awards have been made possible by grants from Freeport-McMoRan and have resulted in many very high quality student presentations. GERS also funds student travel to regional and national meetings.

Today, GERS is a very active research society with a total membership of about 250 scientists, researchers, and students from universities, agencies and research labs along the Gulf coast. Many of the scientists have national and international reputations in their areas of research. This research society is expected to grow in importance during the next decade as human impacts on estuarine and coastal environments continue to escalate rapidly, presenting major challenges in characterizing and understanding ecosystem responses to such impacts. As society, and the scientific community in particular, faces these challenges, coastal research organization such as the Gulf Estuarine Research Society are poised to assume strong leadership positions as representatives for scientists involved in such research.

GERS 2013-2015 Officers

Ken Dunton – President
Tina Miller-Way – Secretary/Treasurer
Michael Murrell – President Elect
Ruth Carmichael – Past President
Robert McAdory – Member at Large
Janet Nestlerode – Member at Large
Erin Kinney – Media Coordinator
Allen Aven – Student Rep

Congratulations to our 2014 Student Travel Award winners!

Allen Aven
Dauphin Island Sea Lab

J. Luke Boutwell
Louisiana State University

Kayla DaCosta
Dauphin Island Sea Lab

Laura Hundy
University of Louisiana at Lafayette

Kathryn Mendenhall
Texas A&M University- Corpus Christi

Haley Nicholson
Dauphin Island Sea Lab

Amanda Anderson

Michael Bollinger
University of Texas at Brownsville

Elizabeth Darrow
Dauphin Island Sea Lab

University of Houston- Clear Lake

Catharine Gross
University of West Florida

Taylor Sloey
University of Lousiana at Lafayette

Laura West
Dauphin Island Sea Lab

Alison Shepherd
University of Texas at Brownsville

Carolyn Weaver
Texas A&M University

Jonathan Rodriquez
University of Texas at Brownsville

Congratulations to the 2014 t-shirt design contest winner!

Rachel Windham
Texas A&M University at Galveston

GERS 2014 ABBREVIATED SCHEDULE

Thursday, October 30th, 2014

8:00 am	Doors open, breakfast available
9:00 am – 9:15 am	Welcome and opening remarks
9:15 am – 10:30 am	**Session I: Fisheries I: Populations and Distributions**
10:30 am – 10:45 am	Break
10:45 am – 11:30 am	**Session II: Wetlands and Freshwater Inflow**
11:30 am – 12:00 pm	**GERS Plenary Speaker Presentation – Dr. Michael Osland**
12:00 pm – 12:15 pm	**GERS Plenary Speaker Q&A – Dr. Michael Osland**
12:15 pm – 1:45 pm	Lunch
1:45 pm – 3:00 pm	**Session III: Management and Restoration**
3:00 pm – 3:15 pm	Break
3:15 pm – 4:30 pm	**Session IV: Fisheries II: Movement and Migration**
5:00 pm – 7:00 pm	**GERS Poster Session and Dinner**
7:30 pm – 9:00 pm	**Beach Bonfire Social**

Friday, October 31st, 2014

8:00 am	Doors open, breakfast available
9:00 am – 9:45 am	**Session V: Contaminants**
9:45 am – 10:15 am	**Session VI: Physiology and Behavior**
10:15 am – 10:45 am	Break
10:45 am – 11:30 am	**Session VII: Monitoring Ecosystem Change**

11:30 am – 12:00 pm	**GERS Plenary Speaker Presentation – Dr. Maggie Walser**
12:00 pm – 12:15 pm	**GERS Plenary Speaker Q&A – Dr. Maggie Walser**
12:15 pm – 1:45 pm	Lunch
1:45 pm – 2:30 pm	**Session VIII: Plant and Animal Indicators**
2:30 pm – 2:45 pm	Break
2:45 pm – 4:00 pm	**Session IX: Population Ecology**
4:00 pm	**GERS Business Meeting and CERF Announcements**
4:30 pm	**GERS 2014 Awards Ceremony**
5:45 pm	**Meet at MSI Marina**
6:00 pm – 7:30 pm	**Halloween Sunset Pirate Cruise**
7:30 pm – 9:00 pm	**Dinner at Fins restaurant**

GERS 2014 PLENARY SPEAKER

Dr. Michael Osland

Research Ecologist, USGS National Wetlands Research Center

Dr. Michael Osland is a Research Ecologist at the U.S. Geological Survey, National Wetlands Research Center in Lafayette, LA. In broad terms, his research examines the response of ecosystems to changing conditions and the implications for ecosystem conservation and restoration. A large portion of his work investigates the ecological implications of climate and land use change within Gulf of Mexico coastal wetland ecosystems. Prior to joining the U.S. Geological Survey, Dr. Osland was a postdoctoral investigator at the U.S. Environmental Protection Agency's Gulf Ecology Division where he examined ecosystem development and functional equivalency during wetland restoration. Dr. Osland completed his Ph.D. in Ecology at Duke University (2009) and his B.A. in Biology at Willamette University in Oregon (2000). He currently serves on the conservation science team of the Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative, a public-private conservation partnership. Dr. Osland has also served as a Fulbright Scholar in Costa Rica and a Peace Corps Volunteer in El Salvador.

October 30th, 2014
11:30 am – 12:15 pm

Climate change and coastal wetlands: ecological transitions along the Gulf of Mexico coast

Michael J. Osland; U.S. Geological Survey, National Wetlands Research Center, Lafayette, Louisiana

Coastal scientists are increasingly challenged to understand and prepare for the effects of climate change upon coastal and estuarine environments. Here, I synthesize findings from several recent and ongoing studies in order to examine some of the effects of climate change upon tidal wetland ecosystems along the Gulf Coast. Due to a low-slope coastline that spans multiple climatic transition zones, tidal wetlands along the Gulf Coast are abundant, diverse, and highly sensitive to climate change. Sea level rise is the climate change factor of greatest concern for tidal wetland ecosystems; however, the ecological effects of sea level rise are influenced by interactions with other aspects of climate change including macroclimatic drivers (e.g., temperature and rainfall regimes). Along the Gulf Coast, macroclimatic drivers are especially important because they greatly influence abiotic conditions and the biotic interactions between foundation species in tidal wetland habitats which include mangrove forest, salt marsh, and salt flat ecosystems. The studies I present collectively highlight important ecological transition zones and address the potential effects of alternative climate change scenarios upon tidal wetland ecosystems.

GERS 2014 PLENARY SPEAKER

Dr. Maggie Walser

Senior Program Officer, National Academy of Sciences

Dr. Maggie Walser is a senior program officer with the Gulf Research Program at the National Research Council (NRC). She contributes to strategic planning and leads education initiatives of the program. Since joining the NRC staff in 2010, she has worked on a number of weather and earth science studies, including such topics as climate science, weather research and policy, climate change and water security, and Arctic research priorities. In 2008-2009, she was the AGU/AAAS Congressional Science and Engineering Fellow and worked on water and energy policy and legislation with the U.S. Senate Committee on Energy and Natural Resources. Prior to her time on the Hill, she was a Postdoctoral Fellow with the National Council for Science and the Environment. She received a Ph.D. in atmospheric chemistry from the University of California, Irvine in 2007. Her doctoral research focused on the composition and photochemical aging of secondary organic aerosol.

October 31st, 2014
11:30 am – 12:15 pm

The Gulf Research Program – emerging opportunities for scientists

Maggie Walser; National Academy of Sciences, Washington, D.C.

The National Academy of Sciences (NAS) is an independent, non-profit organization chartered by Congress in 1863 to provide expert scientific, engineering, and health advice to the nation. In 2013, as

part of the criminal plea agreements with the companies held responsible for the *Deepwater Horizon (DWH)* explosion and fire, the courts asked the NAS to form a $500 million, 30-year program focused on oil system safety and the protection of human health and environmental resources. A fundamental purpose of the Program is to bring the best expertise in science, engineering, technology, and health to advance understanding of the Gulf of Mexico and use that information to help prevent disasters like *DWH*, minimize adverse impacts of offshore energy production, and ensure that the ecosystem and surrounding human communities are resilient to shocks and long term changes. The Program will encourage cross-boundary work across disciplines, across geographic borders, and across perspectives and will fund activities in three categories: research and development, education and training, and environmental monitoring. This presentation will review key elements of the Program's strategic vision (released September 2014), including mission, goals, and objectives. The presentation will also highlight initial funding opportunities for 2015 and 2016, particularly those of interest to students and early-career scientists.

GERS 2014 FULL SCHEDULE

Thursday, October 30th, 2014

8:00 am Doors open, breakfast available
9:00 am Welcome and opening remarks

Session I: Fisheries I: Populations and Distributions

Session Chair: Elizabeth Darrow

9:15 am **Emaciated black drum (*Pogonias cromis*) in the upper Laguna Madre, Texas: tracking the recovery of the population two years later**
Zachary Olsen; Texas Parks and Wildlife Department- Coastal Fisheries Division, Corpus Christi, TX

9:30 am **Using ongoing fishery monitoring to predict the relationship between seagrass habitats and fish CPUE and diversity**
Emma Clarkson; Texas Parks and Wildlife Department, Rockport, TX

9:45 am **Validating side scan sonar as a fish survey tool**
*Michael Bollinger and Richard Kline; University of Texas at Brownsville, Brownsville, TX

10:00 am **Modeling larval oyster distribution in Pensacola Bay**
[1]Steven D. Meyers, [1]Mark E. Luther, [2]William S. Arnold, [3]Stephen P. Geiger; [1]College of Marine Science, University of South Florida, St. Petersburg, FL; [2]NOAA Fisheries Service Southeast Regional Office, St. Petersburg, FL; [3]Fish & Wildlife Research Institute, St. Petersburg, FL

10:15 am ***Periploma margaritaceum* (Bivalvia: Periplomatidae): why are there so many right valves in beach drift?**
Fabio Moretzsohn; Harte Research Institute, Texas A&M University- Corpus Christi, Corpus Christi, TX

10:30 am Break

Session II: Wetlands and Freshwater Inflow

Session Chair: Carolyn Weaver

10:45 am **Using LIDAR topography and image processing techniques for flow paths in tidal marshes**
Ben R. Hodges; Center for Research in Water Resources, University of Texas at Austin, Austin, TX

11:00 am **Determining the effects of freshwater inflow on benthic macrofauna in the Caloosahatchee Estuary, Florida**
[1]Terry A. Palmer, [1]Paul A. Montagna, [2]Robert H. Chamberlain, [2]Peter H. Doering, [2]Yongshan Wan, [2]Kathleen M. Haunert, [2]Daniel J. Crean; [1]Harte Research Institute for Gulf of Mexico Studies, Texas A&M University- Corpus Christi, Corpus Christi, TX; [2]South Florida Water Management District, West Palm Beach, FL

*student presentation

11:15 am **Implications of mangrove expansion in the northern Gulf of Mexico: mangrove and marsh habitats support different nekton species**
*[1]Carolyn A. Weaver, [2]Anna R. Armitage, [3]Sean P. Charles, [4]Sayatani Dastidar, [4]Hongyu Guo, [5]Zoe Huges, [3]John S. Kominoski, [2]Ashley Witt, [4]Steven C. Pennings; [1]Department of Ecosystem Science and Management, Texas A&M University, College Station, TX; [2]Department of Marine Biology, Texas A&M University at Galveston, Galveston, TX; [3]Deparment of Biological Sciences, Florida International University, Miami, FL; [4]Department of Biology and Biochemistry, University of Houston, Houston, TX; [5]Department of Earth and Environment, Boston University, Boston, MA

GERS Plenary Speaker- Dr. Michael Osland

11:30 am **Climate change and coastal wetlands: ecological transitions along the Gulf of Mexico coast**
Michael J. Osland; U.S. Geological Survey, National Wetlands Research Center, Lafayette, LA

12:00 pm Question & Answer Session

12:15 pm Lunch provided at the UTMSI Visitor Center

Session III: Management and Restoration

Session Chair: Laura Hundy

1:45 pm **Determination of seasonal abundance, density, and distribution of nekton species near Cedar Bayou pre- and post-opening**
*[1]Q.A. Hall, [1]M.M. Robillard, [2]J.T. Froeschke, [1]G.W. Stunz; [1]Center for Sportfish Science and Conservation, Harte Research Institute for Gulf of Mexico Studies, Corpus Christi, TX; [2]Gulf of Mexico Fishery Management Council, Tampa, FL

2:00 pm **Galveston Bay wetland mitigation assessment and local government capacity building**

[1]Erin L. Kinney, [1]Lisa A. Gonzalez, [2]John S. Jacob, [2]Rebecca M. DaVonnon, [1]Bradley S. Neish; [1]Houston Advanced Research Center, The Woodlands, TX, [2]Texas Coastal Watershed Program, Texas Agrilife Extension Service/Texas Sea Grant, Texas A&M University System, Houston, TX

2:15 pm **Plant growth and soil shear strength in relation to hydro-edaphic characteristics of restored salt marsh soils**
*Laura C. Hundy and Mark W. Hester, Department of Biology, University of Louisiana at Lafayette, Lafayette, LA

2:30 pm **Considering the influence of storm intensity, population size and wetland abundance on the value of wetlands as storm buffers**
*J. Luke Boutwell, John V. Westra, Rex Caffey; Center for Natural Resource Economics and Policy, Louisiana State University, Baton Rouge, LA

Thursday October 30th, 2014 (continued)

2:45 pm **Response of *Schoenoplectus* spp. to hydrologic and nutrient regimes**
*Taylor M. Sloey and Mark W. Hester; Department of Biology, University of Louisiana at Lafayette, Lafayette, LA

3:00 pm Break

Session IV: Fisheries II: Movement and Migration

Session Chair: John Mohan

3:15 pm **Tracking Alabama's state saltwater fish, Atlantic tarpon (*Megalops atlanticus*), using acoustic and satellite telemetry**
*Andrea M. Kroetz, J. Marcus Drymon, Sean P. Powers; University of South Alabama, Mobile, AL; Dauphin Island Sea Lab, Dauphin Island, AL

3:30 pm **Evidence for offshore blue crab spawning stock in the Gulf of Mexico and implications for fisheries management**
M. Zachary Darnell; Nicholls State University, Thibodaux, LA

3:45 pm **The effects of tides and currents on blue crab (*Callinectes sapidus*) megalopae settlement**
*[1]Claire Weirich, [2]Colleen M. McCue, [2]Lindsay P. Scheef, [2]Edward J. Buskey; [1]Texas Lutheran University, Seguin, TX; [2]Mission-Aransas National Estuarine Research Reserve, Port Aransas, TX

4:00 pm **Chemical signatures in scales reveal estuarine habitat use and trophic shifts of a highly migratory elopiform**
*[1]Matthew Seeley, [1,2]Skye Woodcock, [1]Benjamin Walther; [1]University of Texas Marine Science Institute, Port Aransas, TX; [2]Southern Seas Ecology Laboratories, University of Adelaide, South Australia, Australia

4:15 pm **A multi-proxy approach for estimating estuarine immigration using otolith elements and tissue-specific stable isotopes**
*John Mohan and Benjamin Walther; University of Texas Marine Science Institute, Port Aransas, TX

Poster Session, Costume Contest and Bonfire

5:00 pm – 7:00 pm Poster Session in the UTMSI Lyceum with dinner provided by Black Tie Catering- wear your Halloween costumes and vote in the Costume Contest!

7:30 pm – 9:00 pm Join us at the beach for a bonfire hosted by the UTMSI Graduate Student Association! Refreshments and supplies for s'mores will be provided.

Directions to Bonfire (held just north of the pier):
From Cotter St. (UTMSI): Drive until you hit the beach, turn right, you will see a fire just before the pier
From Beach St., Lantana, Ave. G, or Access Rd. 1: Drive until you hit the beach, turn left, you will see a fire just after the pier

Friday, October 31st, 2014

8:00 am Doors open, breakfast available

Session V: Contaminants

Session Chair: Amanda Fitzgerald

9:00 am **Methylmercury bioaccumulation in game fish food webs of Texas bays and estuaries**
James D. Simons, Kim Withers, Tracy Weatherall; Center for Coastal Studies, Texas A&M University- Corpus Christi, Corpus Christi, TX

9:15 am **Using ramped pyrolysis-gas chromatography-mass spectrometry to evaluate weathering intensity of the oil in Louisiana salt marshes following the Deepwater Horizon oil spill**
*[1]Meredith Evans, [2]Brad E. Rosenheim, [1]Zhanfei Liu; [1]University of Texas Marine Science Institute, Port Aransas, TX; [2]College of Marine Science, University of South Florida, St. Petersburg, FL

9:30 am **Effects of oil concentration on the microbial degradation of *n*-alkanes in crude oil in seawater**
*Andrew Kang, Jiqing Liu, Zhanfei Liu; University of Texas Marine Science Institute, Port Aransas, TX

Session VI: Physiology and Behavior

Session Chair: Rasmus Ern

Effects of methylmercury exposure on oxygen consumption of *Emerita talpoida*
*Debra Hoekel and Kim Withers; Department of Life Sciences, Texas A&M University-Corpus Christi, Corpus Christi, TX *(WITHDRAWN)*

9:45 am **Effects of salinity on blue crab behavior and fitness: a mesocosm study**
[1]Kelbi Delaune, [2]Julia C. Buck, [3]Elizabeth Smith, [1]Jeffrey R. Wozniak; [1]Department of Biological Sciences, Sam Houston State University, Huntsville, TX; [2]Texas Research Institute for Environmental Studies, Sam Houston State University, Huntsville, TX; [3]International Crane Foundation, Corpus Christi, TX

10:00 am **A time activity budget for American oystercatchers (*Haematopus palliatus*) and the factors affecting parental behavior during the incubation and chick rearing periods**
*[1]Amanda Anderson, [2]George Guillen, and [3]Susan Heath; [1]University of Houston- Clear Lake, Houston, TX; [2]Environmental Institute of Houston, University of Houston- Clear Lake, Houston, TX; [3]Gulf Coast Bird Observatory, Lake Jackson, TX

10:15 am Break

Friday, October 31st, 2014 (continued)

Session VII: Monitoring Ecosystem Change

Session Chair: Anne-Marie Gavlas

10:45 am **Nutrient and phytoplankton dynamics in a eutrophic lagoonal estuary, Oso Bay, Texas**
*[1]Kelsey Fisher, [1]Kenneth Hayes, [2]Lynn Price, [1]Michael Wetz; [1]College of Science and Technology, Texas A&M University- Corpus Christi, Corpus Christi, TX; [2]Department of Ocean, Earth, and Atmospheric Science, Old Dominion University, Norfolk, VA

11:00 am **Nutrient and phytoplankton dynamics in Baffin Bay, Texas: influence of physical forcing**
*[1]Emily Cira and [2]Michael Wetz; [1]Department of Physical and Environmental Sciences, Texas A&M University- Corpus Christi, Corpus Christi, TX; [2]Department of Life Sciences, Texas A&M University- Corpus Christi, Corpus Christi, TX

11:15 am **Four years of seagrass monitoring reveals a dramatic change in seagrass percent cover and species composition in Upper Laguna Madre, Texas**
*Sara S. Wilson and Kenneth H. Dunton, University of Texas Marine Science Institute, Port Aransas, TX

GERS Plenary Speaker- Dr. Maggie Walser

11:30 am **The Gulf Research Program- emerging opportunities for scientists**
Maggie Walser; National Academy of Sciences, Washington, D.C.

12:00 pm Question & Answer Session

12:15 pm Lunch

Session VIII: Plant and Animal Indicators

Session Chair: Ruth Carmichael

1:45 pm **Dynamics of zooplankton community in terms of environmental factors in Galveston Bay, Texas**

[1]Hui Liu, [1,2]Antoinetta Quigg, [1]Rujia Bi, [1]Rachel Windham, [1]Tyra Booe; [1]Department of Marine Biology, Texas A&M University, Galveston, TX; [2]Department of Oceanography, Texas A&M University, College Station, TX

2:00 pm **Trematode parasites as indicator species in estuarine ecosystems**

[1]Julia C. Buck, [2]Elizabeth M. Morris, [2]Jeffrey R. Wozniak; [1]Texas Research Institute for Environmental Studies, Sam Houston State University, Huntsville, TX; [2]Department of Biological Sciences, Sam Houston State University, Huntsville, TX

Friday, October 31st, 2014 (continued)

2:15 pm **Pre-historic oysters as time capsules in the northern Gulf of Mexico: nutrient sources, oyster growth, and human land use**

*[1,2]Elizabeth S. Darrow, [1,2]Ruth H. Carmichael, [3]C. Fred T. Andrus, [4]H. Edwin Jackson; [1]Dauphin Island Sea Lab, Dauphin Island, AL; [2]Marine Sciences Department, University of South Alabama, Mobile, AL; [3]Geological Sciences, University of Alabama, Tuscaloosa, AL; [4]Department of Anthropology and Sociology, University of Southern Mississippi, Hattiesburg, MS

2:30 pm Break

Session IX: Population Ecology

Session Chair: Allen Aven

2:45 pm **Investigation of potential factors that influence piping plover distribution along the upper Texas coast**

*[1]Kristen Vale, [2]George Guillen, [3]David Newstead; [1]University of Houston- Clear Lake, TX; [2]Environmental Institute of Houston, University of Houston- Clear Lake, Houston, TX; [3]Coastal Bend Bays & Estuaries Program, Corpus Christi, TX

3:00 pm **How does the environment influence population dynamics of *Acartia tonsa* in the northern Gulf of Mexico?**

*Rujia Bi and Hui Liu; Department of Marine Biology, Texas A&M University, Galveston, TX

3:15 pm **The nesting ecology of the Texas diamondback terrapin (*Malaclemys terrapin littoralis*)**

*Rachel George and George Guillen; Environmental Institute of Houston, University of Houston- Clear Lake, Houston TX

3:30 pm **Population expansion, structure, and migration patterns for the seagrass *Halodule wrightii***

Patrick D. Larkin, Tabitha J. Maloney, Sebastian Rubiano-Rincon, Michael M. Barrett; Department of Physical and Environmental Sciences, Texas A&M University- Corpus Christi, Corpus Christi, TX

3:45 pm	**Understanding Alabama manatees through use of public sightings, remote sensing, and biological sampling** [1,2]R. H. Carmichael, [1,2]A. Aven, [1]E. Hieb; [1]Dauphin Island Sea Lab, Dauphin Island, AL; [2]University of South Alabama, Mobile, AL
4:00	Gulf Estuarine Research Society Business Meeting and Coastal and Estuarine Research Federation Announcements
4:30	Gulf Estuarine Research Society Awards Ceremony and Costume Contest winners

Friday, October 31st, 2014 (continued)

Halloween Pirate Cruise and Dinner

5:45 pm	Meet at UTMSI marina
6:00 pm – 7:30 pm	Join us for a swashbuckling Halloween sunset cruise on the Red Dragon pirate ship! Cash bar and light refreshments will be provided.
7:30 pm – 9:00 pm	Red Dragon pirate ship docks at Fins restaurant for dinner. Shuttles back to UTMSI will be provided from 7:30 – 9:00 pm.

POSTER SESSION DIRECTORY

Estuarine Vertebrate Biology and Ecology

MODELING OF WEST INDIAN MANATEE MOVEMENTS INFORMS UNDERSTANDING OF SPECIES SPACE USE PATTERNS AND RESPONSES TO ENVIRONMENTAL CHANGES
*Allen Aven and Ruth Carmichael; Dauphin Island Sea Lab, Dauphin Island, AL; University of South Alabama, Mobile, AL

ANALYSIS OF MANATEE PERIOTIC BONE MICROCHEMISTRY AS A TOOL TO RETROSPECTIVELY TRACK MANATEE MIGRATIONS IN THE NORTHERN GULF OF MEXICO
*Kayla P. DaCosta, Justin Lew, William F. Patterson, and Ruth H. Carmichael; Dauphin Island Sea Lab, Dauphin Island, AL; University of South Alabama, Mobile, AL

CHARACTERIZING THE BENTHIC FOOD RESOURCES AND HABITAT UTILIZATION OF BLACK DRUM (*POGONIAS CROMIS*) IN BAFFIN BAY, TX
*[1]Kathryn Mendenhall, [1]Jennifer Pollack, [2]Greg Stunz, and [2]Matthew Ajemian; [1]Department of Life Sciences, Texas A&M University- Corpus Christi, Corpus Christi, TX; [2]Harte Research Institute, Texas A&M University- Corpus Christi, Corpus Christi, TX

ACOUSTIC TELEMETRY OF COMMON SNOOK (*CENTROPOMUS UNDECIMALIS*) IN SOUTH TEXAS
*Jonathan Rodriquez and Richard Kline; University of Texas at Brownsville, Brownsville, TX

ARE ESTUARINE FISH (PRE)ADAPTED TO CLIMATE CHANGE?
Rasmus Ern and Andrew Esbaugh; University of Texas Marine Science Institute, Port Aransas, TX

BISPHENOL-A, AND THREE RELATED ALKYLPHENOLS EXERT RAPID ESTROGENIC ACTIONS ON ZEBRAFISH (*DANIO RERIO*) OOCYTES TO MAINTAIN MEIOTIC ARREST
*Amanda Fitzgerald and Peter Thomas; University of Texas Marine Science Institute, Port Aransas, TX

USING LIPID STABLE ISOTOPES TO UNDERSTAND DIET ASSIMILATION IN EXPERIMENTAL ATLANTIC CROAKER
*Eric Attwood, Stephanie Smith, Tara Connelly, John Mohan, Benjamin Walther, and James McClelland; University of Texas Marine Science Institute

SALTMARSH POND CLASSIFICATION AND FISH ASSEMBLAGE STRUCTURE AT THE ARANSAS NATIONAL WILDLIFE REFUGE
Niki Ragan and Jeffrey R. Wozniak; Department of Biological Sciences, Sam Houston State University, Huntsville, TX

*student presentation

POSTER SESSION DIRECTORY (continued)

Bivalve Ecology

ENHANCEMENT OF FISH AND MACROINVERTEBRATE PRODUCTION RESULTING FROM THE RESTORATION OF OYSTER REEF HABITAT IN MATAGORDA BAY, TEXAS
*[1]Kevin De Santiago, [1]Jennifer Pollack, and [2]Terry Palmer; [1]Texas A&M University- Corpus Christi, Corpus Christi, TX; [2]Harte Research Institute, Corpus Christi, TX

INVESTIGATING THE VIABILITY OF THE BRACKISH WATER CLAM *RANGIA CUNEATA* AS AN INDICATOR OF ECOSYSTEM HEALTH IN GALVESTON BAY, TEXAS *(WITHDRAWN)*
*[1]Rachel Windham and [1,2]Antonietta Quigg; [1]Department of Marine Sciences, Texas A&M University at Galveston, Galveston, TX, [2]Department of Marine Biology, Texas A&M University at Galveston, Galveston, TX

MONITORING DERMO IN EASTERN OYSTER *CRASSOSTREA VIRGINICA* POPULATIONS THROUGHOUT MISSION-ARANSAS ESTUARY IN SOUTH TEXAS
*Maria C. Rodriguez, Jennifer B. Pollack, and J.W. Tunnell, Jr; Texas A&M University- Corpus Christi, Corpus Christi, TX

TEXAS SEASHELLS, A NEW FIELD GUIDE
John W. Tunnell, Jr., Noe Barrera, and Fabio Moretzsohn; Harte Research Institute, Texas A&M University-Corpus Christi, Corpus Christi, TX

SUITABILITY OF CALCEIN FOR MASS MARKING MARINE BIVALVE LARVAE (*CRASSOSTREA VIRGINICA*) UNDER DIFFERENT SALINITY AND TANK CONDITIONS
*[1,2]Haley Nicholson, [1,2]Ruth Carmichael, and [3]Scott Rikard; [1]University of South Alabama, Mobile, AL, [2]Dauphin Island Sea Lab, Dauphin Island, AL, [3]Auburn University Shellfish Laboratory, Dauphin Island, AL

ASSESSING THE HABITAT VALUE OF ALTERNATIVE SUBSTRATES FOR OYSTER REEF RESTORATION
*Patrick Graham, Jennifer Pollack, and Terry Palmer; [1]Department of Life Sciences, Texas A&M University-Corpus Christi, Corpus Christi, TX

Estuarine Plants and Macroalgae

THE RESPONSE OF ENCROACHING *AVICENNIA GERMINANS* ON THE SEDIMENT BIOGEOCHEMICAL AND FAUNAL COMPOSITION OF A SOUTH TEXAS *SPARTINA ALTERNIFLORA* SALT MARSH
*Riley Egger, Samantha Setta, and Ken Dunton; University of Texas Marine Science Institute, Port Aransas, TX

ECOSYSTEM ENGINEERING CAPACITIES OF *AVICENNIA GERMINANS* AND *SPARTINA ALTERNIFLORA* IN THE MANGROVE/MARSH ECOTONE UNDER FREEZE AND SEA LEVEL RISE STRESSORS
*[1,2]A. Macy, [1,2]J. Cebrian, [3]M. Osland, and [4]J. Cherry; [1]Dauphin Island Sea Lab, Dauphin Island, AL, [2]Department of Marine Sciences, University of South Alabama, Mobile, AL, [3] U.S. Geological Survey, National Wetlands Research Center, Lafayette, LA, [4]New College and Department of Biological Sciences, University of Alabama, Tuscaloosa, AL

POSTER SESSION DIRECTORY (continued)

DAMAGE AND RECOVERY OF BLACK MANGROVE (*AVICENNIA GERMINANS*) FROM THE JANUARY 2010 FREEZE ON THE LOUISIANA COAST
Richard H. Day; U.S. Geological Survey National Wetlands Research Center, Lafayette, LA

CARBON AND NUTRIENT DYNAMICS OF DISTURBED SEAGRASS ECOSYSTEMS
*Alison Shepherd, Abdullah Rahman, and Heather Alexander; University of Texas at Brownsville, Brownsville, TX

COMPARING NEKTON COMMUNITIES BETWEEN FRINGING COASTAL MARSHES AND ADJACENT SEAGRASS BEDS
*[1,2]Laura West, [1]Ryan Moody, [1,2]Just Cebrian, [3]Rich Aronson, [1,2]Ken Heck, and [1]Dottie Byron; [1]Dauphin Island Sea Lab, Dauphin Island, AL, [2]University of South Alabama, Mobile, AL, [3]Florida Institute of Technology, Melbourne, FL

DIVERSITY AND TAXONOMIC RICHNESS OF MACROALGAE AMONG CENOTES OF THE EASTERN YUCATAN PENINSULA
*[1]Madison L. Becker, [1]Sylvia F. Garza, [2]Stein Fredriksen, and [3]Kenneth H. Dunton; [1]University of Texas, Austin, TX, [2]Department of Biology, University of Oslo, Oslo, Norway, [3]University of Texas Marine Science Institute, Port Aransas, TX

Biogeochemical Processes

ORGANIC MATTER LOADING AND HETEROTROPHIC BACTERIAL ABUNDANCE IN A EUTROPHIC, LAGOONAL ESTUARY (OSO BAY, CORPUS CHRISTI, TX)
*Kenneth C. Hayes, Emily Cira, Kelsey Fisher, Ben R. Smith, and Michael S. Wetz; College of Science & Engineering, Texas A&M University- Corpus Christi, Corpus Christi, TX

RELATIONSHIP BETWEEN THE ZOOPLANKTON COMMUNITY AND WATER QUALITY IN AN URBANIZING, EUTROPHIC ESTUARY (OSO BAY, TX)
*Anne-Marie Gavlas; Texas A&M University, Corpus Christi, TX

COASTAL DUNE LAKES OF NORTHWEST FLORIDA: MULTIVARIATE ANALYSIS OF WATER QUALITY DATA TO ESTABLISH LAKE CLASSIFICATION AND PROPOSE ECOSYSTEM SPECIFIC NUTRIENT CRITERIA *(WITHDRAWN)*

*[1]Catharine D. Gross, [2]Jane M. Caffrey, and [1]Matthew C. Schwartz; [1]Department of Environmental Studies, University of West Florida, Pensacola, FL, [2]Center for Environmental Diagnostics and Bioremediation, University of West Florida, Pensacola, FL

ASSESSING THE ABUNDANCE AND DISTRIBUTION OF MICROPLASTICS IN A GULF OF MEXICO ESTUARY

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POSTER SESSION DIRECTORY (continued)

USING SEDIMENT GRAIN SIZE ANALYSIS IN CONJUNCTION WITH FORAMINIFERAL ASSEMBLAGE PATTERNS AS PROXIES TO DISCERN DROUGHT AND WATER BALANCE ISSUES IN NUECES BAY, SOUTH TEXAS.

*Mark C. McKay and Mark Besonen; Earth System Science Laboratory, Texas A&M University- Corpus Christi, Corpus Christi, TX

CONTROL OF ORGANIC MATTER QUALITY ON NITROGEN CYCLING AT THE SEDIMENT-WATER INTERFACE IN COASTAL SYSTEMS

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Monitoring and Management

GULF OF MEXICO SPECIES INTERACTIONS (GOMEXSI) DATABASE: CURRENT STATUS AND FUTURE PLANS FOR A GULF DATA RESOURCE

[1]J.D. Simons, [2]M. Yuan, [3]C. Carollo, [4]M.E. Vega Cendeja, [5]J. Poelen, [6]D. Reed, and [7]C. Ainsworth; [1]Center for Coastal Studies, Texas A&M University-Corpus Christi, Corpus Christi, TX, [2]Geoinformatics and Center for Spatial Analysis, University of Oklahoma, Norman, OK, [3]Harte Research Institute, Texas A&M University-Corpus Christi, Corpus Christi, TX, [4]Centro de Investigacion de Estudios Avanzados del Instituto Politecnico Nacional, Yucatan, Mexico, [5]Data Analysis and Visualization Consultant, Oakland, CA, [6]Florida Wildlife Research Institute, Florida Fish and Wildlife Conservation Commission, St. Petersburg, FL, [7]College of Marine Science, University of South Florida, St. Petersburg, FL

ZOOPLANKTON MONITORING IN THE MISSION-ARANSAS RESERVE

Rae F. Mooney, Cammie J. Hyatt, and Edward J. Buskey; Mission-Aransas National Estuarine Research Reserve and the University of Texas Marine Science Institute

DATA TO DECISIONS: SUPPORTING EFFECTIVE COASTAL MANAGEMENT

Kelly M. Darnell, Melissa Baustian, Ann C. Hijuelos, Leland C. Moss and Tim J.B. Carruthers; The Water Institute of the Gulf, Baton Rouge, LA

OUR GLOBAL ESTUARY: A STRATEGY FOR SCIENCE-BASED ESTUARINE OBSERVATION AND PREDICTION NETWORKS

[1]Edward J. Buskey, [2]Antonio Baptista, and [3]Megan Davis; [1]University of Texas Marine Science Institute, Port Aransas, TX, [2]Oregon Health & Science University, Portland, OR, [3]Harbor Branch Oceanographic Institute, Fort Pierce, FL

ORAL PRESENTATION ABSTRACTS

EMACIATED BLACK DRUM (*POGONIAS CROMIS*) IN THE UPPER LAGUNA MADRE, TEXAS: TRACKING THE RECOVERY OF THE POPULATION TWO YEARS LATER

Zachary Olsen; Texas Parks and Wildlife Department- Coastal Fisheries Division, Corpus Christi, TX

Black drum, *Pogonias cromis*, are the focus of a major commercial and recreational fishery in Texas coastal waters with the upper Laguna Madre producing the greatest proportion of commercial landings. During fall 2012, the black drum population in the Baffin Bay area of the upper Laguna Madre experienced an emaciation event. Individuals exhibited gelatinous fillets with reduced white muscle along the dorsal region, little to no digestate in the gut and, in some cases, atrophy of the internal organs. These individuals were found to be underweight compared to those in the northern Laguna Madre. After this initial emaciation event, Texas Parks and Wildlife Department- Coastal Fisheries Division staff continued to quantitatively monitor the health of this population using condition factor analysis through spring 2014. This analysis suggests that the Baffin Bay area population of black drum had begun recovery from the fall 2012 emaciation event by spring 2013 and had completely recovered by spring 2014. This was also reflected in decreased reports of emaciated black drum from both recreational and commercial anglers.

USING ONGOING FISHERY MONITORING TO PREDICT THE RELATIONSHIP BETWEEN SEAGRASS HABITATS AND FISH CPUE AND DIVERSITY

Emma Clarkson; Texas Parks and Wildlife, Rockport, TX

Seagrasses play an integral role in the aquatic community; they oxygenate the water, stabilize sediments, increase water quality, and provide habitat for important fish and invertebrate species. Recent efforts have been made by Texas Parks and Wildlife, UTMSI, and other organizations to map and monitor seagrass distribution in Texas bays. This study compares these maps to fisheries data, including CPUE and diversity, from the ongoing fisheries monitoring work of Texas Parks and Wildlife in an attempt to find a correlation between fish distribution and seagrass habitats. Catch per unit effort for most sportfish, including Red drum (*Sciaenops ocellatus),* Black drum *(Pogonias cromas),* and Spotted seatrout (*Cynoscion nebulosus),* was higher in non-seagrass habitats versus seagrass habitats. Within seagrass habitats, CPUE of these fish species generally increased with increasing total percent vegetation cover, but this regression was not significant in most cases. Diversity was not significantly different between non-seagrass and seagrass habitats. It is possible that this is due to a comparable

amount of habitat complexity in our adjacent “non-seagrass” habitats, such as macroalgae or oyster reef habitat. Alternatively, this could imply that our mapping and fisheries monitoring are not at the resolution required to assess impacts of seagrass habitats on fisheries. The results of this study can be important in identifying the future needs of monitoring and management of fisheries and seagrass habitats.

*student presentation

VALIDATING SIDE SCAN SONAR AS A FISH SURVEY TOOL

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Artificial reefs are becoming increasingly important in fisheries management in the Gulf of Mexico. Current survey techniques are crippled by the occasionally low visibility and ripping currents of the Gulf of Mexico. Hydroacoustics lends a solution to these harsh environmental conditions. This study validates and outlines a methodology to use side scan sonar to survey artificial reefs. Side scan sonar is particularly useful because of the wide beam angle that ensonifies a large swath of the water column, its economic viability, and reduced labor needed to carry out a survey. This study focuses on fish abundance, and ground truthing the side scan sonar technology to determine fish community biomass. Preliminary results suggest more fish are being recorded on sonar surveys than in visual surveys of the same site where mean fish abundance was 488 ± 186.1 for sonar and 172.1 ± 31.7 for visual SCUBA surveys.

MODELING LARVAL OYSTER DISTRIBUTION IN PENSACOLA BAY

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Water quality parameters and Eastern oyster (*Crassostrea virginica*) settlement collectors were monitored in the Pensacola Bay estuary in May 2007 and then from July 2007 through July 2008 to evaluate connectivity patterns within the framework of an integrated hydrodynamic/particle dispersal model. Salinity data was used to calibrate an Estuarine Coastal Ocean Model (ECOM) numerical circulation model of Pensacola Bay, which was then coupled to an existing oyster larval dynamics routine which predicted ontogenetic larval distribution. Three-dimensional Lagrangian transport algorithms were then used to simulate larval transport during four 20 d time periods during those summer and autumn months when oyster recruitment was empirically recorded in the bay. Based on outcomes from contemporaneous sampling of oyster larvae, the model was shown to represent the salient features of oyster larval distribution in Pensacola Bay. The spatial pattern of recruitment was shown to be dependent on the ontogenetic vertical distribution of the larvae, with transport dominated by the winds and tides. Larval transfer rates within and among previously identified oyster reefs in Pensacola Bay were determined and were used to predict optimal oyster reef restoration or rehabilitation sites. Finally, larval exports from the bay were estimated and considered within the context of larval exchange among north Florida estuaries and potential repercussions to the long-term health of the Gulf of Mexico oyster metapopulation.

PERIPLOMA MARGARITACEUM (BIVALVIA: PERIPLOMATIDAE): WHY ARE THERE SO MANY RIGHT VALVES IN BEACH DRIFT?

Fabio Moretzsohn; Harte Research Institute, Texas A&M University- Corpus Christi, Corpus Christi, TX

The Unequal Spoonclam, *Periploma margaritaceum* (Periplomatidae) is a small and fragile bivalve that is found in large numbers in bays, estuaries, and along the Gulf of Mexico coast of Texas. It lives buried shallowly into the sediment, where bird and crab predators dig it up and easily crush its shell; broken shells are then further degraded into small pieces by wave action. Predatory naticid snails (moon snails) search for the bivalve and drill a neat round hole on the shell; although boreholes weaken the shell, drilled shells are common in beach drift. Once the animal dies and the empty shell is washed on the beach, its thin ligament dries up and the valves become disarticulated. On the Gulf coast, where the water energy is high, articulated pairs are rarely found, but in bays and estuaries articulated pairs are common on the beach. As the popular name suggests, the valves have different sizes and shapes, with the right one being larger and more convex than the left. This difference contributes to a strong differential valve sorting in beach drift, mainly driven by water currents, wind, beach topology and shell shape. On average, there is almost a twofold bias on right to left valve ratio on Gulf beaches, and a fourfold bias in L/R valve ratio at University Beach, Corpus Christi Bay. This presentation will discuss some of the possible explanation for this bias.

USING LIDAR TOPOGRAPHY AND IMAGE PROCESSING TECHNIQUES FOR FLOW PATHS IN TIDAL MARSHES

Ben R. Hodges; Center for Research in Water Resources, University of Texas at Austin, Austin, TX

Airborne lidar can provide relatively fine topographic detail, on the order of 1x1 m horizontal resolution. However, even with today's fast workstation computers with large memories and massive disk storage space, using the fine resolution lidar data as a basis for flow modeling over a large area is simply impractical. Model time steps are driven down to sub-second intervals such that the computational effort for seasonal to annual modeling requires supercomputer capabilities. As an alternative, we can use techniques from the image processing to identify flow paths and create an approximate topography at a coarser scale that provides a more practical basis for flow modeling. In this presentation, lidar bathymetry from the Nueces Delta (originally processed by J. Gibeaut) is used as a basis for illustrating how image processing techniques can be used to identify features, blockage, and preferential flow paths in a complex marsh system. Although these techniques are focused on issues of flow modeling, they have a broader relevance for habit and connectivity analysis that should be valuable to the broader estuarine research community.

DETERMINING THE EFFECTS OF FRESHWATER INFLOW ON BENTHIC MACROFAUNA IN THE CALOOSAHATCHEE ESTUARY, FLORIDA

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The Caloosahatchee Estuary is a small (62 km^2) but significant part of the Charlotte Harbor estuarine complex, which is located in the southwest coast of Florida. Changes in inflow dynamics to the Caloosahatchee Estuary have altered salinity regimes which in turn have altered the ecological integrity of the estuary. These changes have prompted the development of the Caloosahatchee River Watershed Protection Plan, which in part has an aim to minimize undesirable flows to the estuary. The purpose of this current project is to determine how changes in freshwater inflows affect water quality, and in turn benthic macrofauna, spatially within the Caloosahatchee Estuary and between multi-year wet and dry periods. There is a spatial zonation in water quality within the estuary and significant increases in salinity during dry relative to wet periods throughout the estuary. A positive relationship between salinity and diversity occurs both spatially and temporally. Thirty-four benthic species were identified as being indicator species for salinity. The estuary was divided into four zones based on differences in community structure within the estuary. Community structure had the highest correlations with water quality parameters that were common freshwater indicators. A salinity-based model was used to estimate inflow during wet and dry periods for each of the macrofauna community zones. The bioindicator species and community zones with corresponding inflow ranges will be useful in managing inflow to the Caloosahatchee Estuary.

IMPLICATIONS OF MANGROVE EXPANSION IN THE NORTHERN GULF OF MEXICO: MANGROVE AND MARSH HABITATS SUPPORT DIFFERENT NEKTON SPECIES

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Tropical mangrove and temperate salt marsh species coexist in many subtropical ecotones, where freezing events limit the growth of cold-sensitive mangroves. Global climate changes, such as warmer winter temperatures, are facilitating mangrove range expansion into temperate salt marshes. Many marine animals seek refuge within mangrove and salt marsh habitats, but little is known how mangrove expansion will alter nekton community structure. From 2012-2014, we conducted annual surveys of nekton species composition and relative abundances using a 20ft bag seine adjacent to mangrove and marsh dominated shorelines within Corpus Christi Bay, TX and Copano Bay, TX. Based on abundance data, faunal communities were significantly different between marsh and mangrove dominated sites (ANOSIM Global R = 0.479; p = 0.029). Average total individuals (mangrove = 276.6±117.9SE; marsh = 320.9 ±115.4SE) were similar between vegetation types, however they were highly variable. Shannon-Wiener Diversity Index was not significantly different between mangrove (1.1±0.1SE) and marsh (0.9±2.1SE) dominated sites, nor was species richness (mangrove = 8.6±2.1SE; marsh = 6.9±1.0SE). However, the species collected from each site differed between dominant vegetation types. For example, inland silverside (*Menidia beryllina*) was the most prolific mangrove fish species and was 2.5 times more abundant than in the salt marsh sites. Bay anchovies (*Anchoa mitchilli*) dominated the marsh sites (86.3±48.7SE), but were only collected in one mangrove site in 2012. The disparities in nekton species between dominant vegetation types suggest that mangrove and marsh habitats support different species, and faunal community structure may be altered as mangroves expand into salt marshes.

DETERMINATION OF SEASONAL ABUNDANCE, DENSITY, AND DISTRIBUTION OF NEKTON SPECIES NEAR CEDAR BAYOU PRE- AND POST-OPENING

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In April of 2014 a collaborative effort began to dredge and reopen Cedar Bayou, a natural tidal inlet that historically linked Mesquite Bay, TX, to the Gulf of Mexico. Research has shown the importance of tidal inlets for migration and dispersal of juvenile and adult nekton. Thus, the main objectives of this study are: 1) determine how juvenile nekton densities change in Mesquite Bay pre- and post- opening, 2) use historical data to create a model capable of predicting nekton densities in Mesquite Bay based on environmental conditions, and 3) assess changes to adult Red Drum (*Sciaenops ocellatus*) movements in Mesquite Bay using acoustic telemetry pre- and post- opening. Using historic data from the Texas Parks and Wildlife Department's long-term monitoring program allowed us to model changes in catch-per-unit-effort (CPUE) of ten ecologically and economically important nekton species based on environmental factors including the historic flow status of Cedar Bayou. Initial analysis indicates a lack of key juvenile densities for several estuarine-dependent nekton species, such as *S. ocellatus* and Southern Flounder (*Paralichthys lethostigma*), near the closed Cedar Bayou yet densities are significantly higher near open and flowing inlets. We hypothesize the densities of these species will change once inlet is open in Fall 2014. Model predictions indicate that opening Cedar Bayou should result in significantly increased nekton densities for estuarine-dependent species. Preliminary movement data indicates that individual *S. ocellatus* have variable movements within Mesquite Bay, but currently no clear patterns have emerged prior to opening. Quantifying potential changes in abundance, density, and distribution of nekton in the Mesquite Bay complex pre- and post-opening of Cedar Bayou will elucidate the value of tidal inlets within the Gulf of Mexico ecosystem.

GALVESTON BAY WETLAND MITIGATION ASSESSMENT AND LOCAL GOVERNMENT CAPACITY BUILDING

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Wetland loss in the greater Houston region is accelerating as population and development continue to increase. The fill or destruction of "jurisdictional" wetlands requires a permit from the US Army Corps of Engineers (USACE), and in many cases mitigation is mandated. "No Net Loss" is the official policy of the wetland mitigation program administered under Section 404 of the Clean Water Act, but wetland habitats lying outside of the 100-year floodplain are largely unprotected by the federal regulatory system. The term "no net loss" should therefore be clarified to mean "no net loss of jurisdictional wetlands". We sought to assess the effectiveness of "no net loss" and also, to address the apparent disconnect between local governments and the federal permitting process. First, we evaluated 123 USACE wetland permits in the 8-county region surrounding Houston, Texas between 1990 and 2012 for impacts, mitigation and compliance. Second, to address the apparent disconnect between issues of water quality and flooding and the role that wetlands play in providing ecosystem services, we developed a regional decision support tool that can provide information to local governments and citizens, allowing them to access information describing potential development impacts to wetlands, floodplains and water quality. We found that only 56% of USACE wetland permits were in compliance and Required wetland mitigation acreage was no better than 1:1 (impacted to compensated), and may

be much lower. Outreach with the Wetland Tool indicates a need for geospatial datasets as well as a platform to access them.

PLANT GROWTH AND SOIL SHEAR STRENGTH IN RELATION TO HYDRO-EDAPHIC CHARACTERISTICS OF RESTORED SALT MARSH SOILS

*Laura C. Hundy and Mark W. Hester, Department of Biology, University of Louisiana at Lafayette, Lafayette, LA

Soil shear strength is an important soil property that should be considered in salt marsh restoration designs, as soils with higher shear strength may be more resistant to erosion. However, the relationship between soil properties, plant community composition, elevation, and soil shear strength in restored salt marshes has not been fully investigated. We conducted a controlled greenhouse experiment to examine the relationships between soil properties, nutrients, and hydrology on the growth response of smooth cordgrass (*Spartina alterniflora*) and black mangrove (*Avicennia germinans*) and the resultant influence on soil shear strength. Black mangrove survival was maximized at mean water level and was not effected by soil type or nutrient status. Aboveground growth of black mangrove was greatest at mean water level and was also associated with nutrient status and soil type. Similarly, *S. alterniflora* survival was greatest at mean water level although stem growth was highest 15 cm below mean water level and marginally influenced by nutrient status. At shallow depths, soil shear strength was strongly tied to plant survival and soil type, suggesting that both biotic and abiotic factors are important in determining soil shear strength. At deeper soil depths, soil shear strength was not related to plant survival but was solely attributed to soil type, with sandy soil having significantly higher shear strength than silt/clay marsh sediments. Results from this study provide essential information on the suite of characteristics that both optimizes the growth of salt marsh vegetation and in turn, produces the most resilient and stable restored marsh.

CONSIDERING THE INFLUENCE OF STORM INTENSITY, POPULATION SIZE AND WETLAND ABUNDANCE ON THE VALUE OF WETLANDS AS STORM BUFFERS

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Coastal communities along the gulf coast are annually threatened by coastal storms. Population grown, land-use change and potentially changing storm regimes are likely to increase coastal vulnerability to these events. Increasingly, coastal management entities are managing land resources to reduce the economic impact of natural disasters. This is true in Louisiana where coastal storms are regular events and land loss is increasing coastal vulnerability. The Louisiana Coastal Master Plan allocates billions of dollars to coastal restoration projects, many of which are intended to mitigate economic damages from tropical storms and hurricanes. Despite this significant proposed investment, the risk reduction value of these projects has not been analyzed, and the wisdom of using wetlands as storm buffers has been questioned. This analysis uses model simulation data and hurricane impact data to estimate the parish-level impacts of hurricanes in Louisiana from 1997-2008. Using this information, a damage model is estimated that describes economic damages as a function of population, wetland protection and storm intensity. The results describe the value of wetlands in various contexts and can be used to estimate how wetland loss, population growth and climate change may influence a regions vulnerability to economic damage resulting from coastal storms. This information could be valuable for project prioritization and is useful for evaluating the value of projects over different time horizons.

RESPONSE OF *SCHOENOPLECTUS* SPP. TO HYDROLOGIC AND NUTRIENT REGIMES

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Abiotic factors, such as hydrologic regime and nutrient availability, exert strong influences on plant survival, morphology, and growth. We implemented two separate greenhouse experiments to investigate the effects of 1) flooding regime and 2) nutrient availability on the survival, growth, morphology and physiology of two species of macrophytes commonly used in tidal freshwater wetland restoration planting efforts (*Schoenoplectus acutus* and *S. californicus*). The flooding experiment revealed that *S. acutus* growth, survival, and stem rigidity were inhibited by increased duration of flooding, whereas *S. californicus* was more robust to longer durations of flooding. In the nutrient regime study we modified the concentrations of ammonium nitrate and silica to determine their interactive effects on the growth, morphology, and physiology of these key species. Preliminary results suggest that although nitrogen enhances primary production, in the presence of abundant nitrogen, silica may become a limiting nutrient. Additionally, silica may play an important role in increasing stem strength, which may also limit herbivore damage. The information gained from these studies has important implications for freshwater wetland restoration throughout the range of these species, especially in regards to designing the proper hydrology and soil nutrient supply to promote vigorous growth of *Schoenoplectus* sp. while maintaining stem strength and resistance to lodging.

TRACKING ALABAMA'S STATE SALTWATER FISH, ATLANTIC TARPON (*MEGALOPS ATLANTICUS*), USING ACOUSTIC AND SATELLITE TELEMETRY

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The recent collapse of many estuarine and marine fisheries has been widely recognized and is particularly acute for fishes that are long lived, slow growing, and reach sexual maturity at a late age. Several of these fishes have life histories that include ontogenetic movements across estuarine habitats and knowing how much area an individual uses during their residency in a marine habitat is vital to understanding the life history of a species. Atlantic tarpon (*Megalops atlanticus*) are a highly migratory and highly prized sport fish throughout the Gulf of Mexico. Although this fish is a highly prized sport fish, little is known about the ecology of this species. We applied satellite and acoustic telemetry to adult tarpon in Mobile Bay and surrounding coastal waters of Alabama to investigate fine- and large-scale movement patterns of this species. From July-October 2014, 5 adult tarpon (mean size= 1771 mm total length, mean weight= 40 kg) were tagged with an acoustic and a pop-off archival tag (PAT). An acoustic array was used to monitor the fine-scale movements of this large fish and data were downloaded every 3 months. The PAT tags are programmed to pop-off and transmit data after 320 days on the fish and thus data will be transmitted in the spring/summer of 2015. Data from this study will provide valuable insight into the movements of Alabama's state saltwater fish in Mobile Bay and surrounding coastal waters, which are previously unknown.

EVIDENCE FOR AN OFFSHORE BLUE CRAB SPAWNING STOCK IN THE GULF OF MEXICO AND IMPLICATIONS FOR FISHERIES MANAGEMENT.

M. Zachary Darnell; Nicholls State University, Thibodaux, LA

Female blue crabs undertake a critical spawning migration seaward to spawn, migrating from low-salinity mating habitat to high-salinity waters of the lower estuaries and coastal ocean, where larval survival is highest. Although typically considered an estuarine species and managed on a state-by-state basis, recent evidence suggests that offshore waters are important spawning grounds for female blue crabs in the Gulf of Mexico. This is especially true in areas where freshwater inflow is high, resulting in low estuarine and coastal salinities. In low-salinity, high-inflow areas (e.g., Louisiana), spawning occurs further offshore while in high-salinity, low-inflow areas (e.g., South Texas), spawning takes place primarily within the estuary. These differences in spawning locations may have implications for population connectivity, especially under drought conditions, and emphasize the need for place-based management of the blue crab spawning stock. Additionally, an offshore spawning stock coupled with large-scale offshore migratory movements suggests the needs for regional and interjurisdictional management strategies to ensure sustainability of the blue crab fishery.

THE EFFECTS OF TIDES AND CURRENTS ON BLUE CRAB (*CALLINECTES SAPIDUS*) MEGALOPAE SETTLEMENT

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The Texas Parks and Wildlife Department has documented that the blue crab populations in the Mission-Aransas Estuary have been declining since the 1980s. The larval blue crabs (megalopae) hatch in the Gulf of Mexico and are returned by tides and currents to the estuary through the Aransas Pass Ship Channel in Port Aransas, TX. This phenomenon could possibly be influencing blue crab abundance in the estuary. The Mission-Aransas National Estuarine Research Reserve's Citizen Science: Larval Blue Crab Monitoring Project has been collecting data for blue crab megalopae in the Mission-Aransas Reserve since May of 2012. Hog's hair collectors are used by the Citizen Science project to sample the frequency and abundance of megalopae entering the estuary. To determine the influence of tides and currents on the number of megalopae settling on the hog's hair collectors, collectors were sampled daily for settlement from the UTMSI pier, and continuous measurements of tides and currents were taken with a tilt current meter placed under the pier. Highest numbers of megalopae were seen on nights dominated by incoming tide. There was no direct relationship between megalopae settlement and the maximum, minimum, or mean current speed for each night. However, there was an inverse relationship between megalopae collected and mean current speed just before sunrise. Although there are many factors that may affect the settlement of megalopae on the collectors, this study demonstrates that tide and current activity is a critical variable to take into consideration when analyzing the income of megalopae from the ocean.

CHEMICAL SIGNATURES IN SCALES REVEAL ESTUARINE HABITAT USE AND TROPHIC SHIFTS OF A HIGHLY MIGRATORY ELOPIFORM

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Fish scales are potential nonlethal analogues to otoliths that may be sampled for chemical signatures to reconstruct habitat usage of mobile species and trophic dynamics. We conducted analyses of organic ($\delta^{13}C$ and $\delta^{15}N$) and inorganic (Sr:Ca and Ba:Ca) proxies in scales of Atlantic tarpon *Megalops atlanticus* from the Gulf of Mexico and Caribbean to identify movements across estuarine salinity gradients and ontogenetic trophic shifts. Analyses were conducted in two ways: 1) paired subsamples were extracted from individual scales at designated locations to incorporate three life history intervals and

homogenized for solution-based ICP-MS and isotope ratio MS and 2) embedded scales were cross sectioned to reveal the surficial calcified layer which was then analyzed with laser ablation ICP-MS to produce continuous profiles of element:Ca ratios. Paired homogenized subsamples showed consistent shifts in Sr:Ca, Ba:Ca and $\delta^{13}C$ that reflected anticipated ontogenetic movements across estuarine salinity gradients. Strong correlations between Sr:Ca and $\delta^{13}C$ indicated that $\delta^{13}C$ primarily reflected salinity rather than trophic position. In contrast, $\delta^{15}N$ was not correlated with salinity proxies, as expected given trophic enrichments regardless of habitat use. Continuous laser ablation profiles provided high-resolution measurements of Sr:Ca and Ba:Ca values from the core (youngest increments) to the edge (oldest increments). Results indicate that individual behavior is highly variable, with certain fish transiting estuarine gradients into oligohaline waters at different life stages. Our findings demonstrate the utility of scales as non-lethal alternatives to otoliths when investigating fish migrations across estuarine gradients.

A MULTI-PROXY APPROACH FOR ESTIMATING ESTUARINE IMMIGRATION USING OTOLITH ELEMENTS AND TISSUE-SPECIFIC STABLE ISOTOPES

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A novel multi-proxy approach was developed to estimate estuarine immigration of juvenile Atlantic croaker, *Micropogonias undulatus*, in subtropical estuaries of the western Gulf of Mexico. Juvenile fish and water samples were collected along a latitudinal gradient that included positive, neutral, and negative estuary types, to test the hypothesis that juvenile fish immigration timing would vary along a climatic gradient. Lifetime otolith elemental transects of Sr:Ca and Ba:Ca were used to detect fish movement across salinity gradients, while tissue-specific stable nitrogen and carbon isotope ratios revealed time since fish switched from offshore to inshore food webs. A controlled diet-switch experiment determined that liver tissue equilibrated with diet 3X faster than muscle, and that isotope turnover was dependent on growth rate. Nitrogen isotopes in both liver and muscle tissues were highly correlated (r^2=0.98) and showed clear geographic separation between bays, suggesting that fish had immigrated inshore at least 3 months prior in all bays. Carbon isotopes in muscle and liver tissues were also correlated (r^2=0.79), but overlap in $\delta^{13}C$ values occurred between all bays, potentially indicating early or late migrants in each bay that will be identified with otolith chemistry. We compare fish immigration timing estimates using otolith chemistry and tissue-specific stable isotopes across each estuary, and present a framework highlighting the advantages, complexities and assumptions of this multi-proxy approach.

METHYLMERCURY BIOACCUMULATION IN GAME FISH FOOD WEBS OF TEXAS BAYS AND ESTUARIES

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Methylmercury, the most toxic form of mercury, bioaccumulates in terrestrial and aquatic food webs. Humans are exposed mainly through consumption of predatory fish, with children who consume large amounts of marine seafood most at risk. Atmospheric inorganic mercury, mostly from electric utility emissions, occurs in precipitation and particulates which is deposited into lakes, rivers, and estuaries where it is converted to methylmercury. There are few data to trace mercury from the environment through food webs to humans. This project will provide information on mercury concentrations in tissues of food web components of red drum, black drum and spotted seatrout. Our study area is Lavaca Bay, San Antonio Bay and Nueces Bay, which are popular areas for fishing and crabbing. Our objectives are: 1) analyze tissues and food organisms of Texas coastal game fishes to assess

methylmercury concentrations in study area food webs; 2) conduct stomach content analysis on games fishes to confirm food choices; 3) conduct stable isotope analysis on predator and prey organisms to confirm food web linkages; and, 4) construct a model of likely pathways of methylmercury bioaccumulation in Texas food webs. Game fishes, prey organisms (fishes, shrimps, crabs, polychaetes, molluscs), phytoplankton, zooplankton, and sediments were collected for methylmercury and stable isotope analyses. Preliminary results indicate spotted seatrout had highest mean methylmercury concentration (1011 ng/g dw) with black drum lowest at 529 ng/g dw. Mean total mercury for prey items was highest in Lavaca Bay (88.1 ng/g dw) with San Antonio Bay lowest at 24.3 ng/g dw.

USING RAMPED PYROLYSIS-GAS CHROMATOGRAPHY-MASS SPECTROMETRY TO EVALUATE WEATHERING INTENSITY OF THE OIL IN LOUISIANA SALT MARSHES FOLLOWING THE DEEPWATER HORIZON OIL SPILL

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Determining the weathering degree of oil after an oceanic spill is important for evaluating the fate and toxicity of oil in marine ecosystems. The majority of weathered oil is uncharacterizable, or out of the analytical window, by traditional investigatory techniques. In this study we combined gas chromatography-mass spectrometry and ramped pyrolysis in order to analyze oil collected from ocean surface and coastal marshes following the Deepwater Horizon oil spill. We used pyrolysis to heat/crack samples over a controlled temperature ramp, which volatilized contents for compound specific analysis using GC-MS. Using ramped pyrolysis with cold-trapping capabilities, we also analyzed the compound spectra of different thermal slices (or selected temperature ranges during pyrolysis), with slices having anthropogenic versus non-anthropogenic origins. Using these techniques, we found that (a) samples collected later in time were more weathered and showed lower total ion count (TIC) in lower thermal ranges, (b) all samples showed similar TIC in higher thermal ranges, suggesting non-anthropogenic background and (c) more weathered samples showed higher molecular weight compounds within the anthropogenic portion. This information was confirmed by comparison to traditional chemical analysis, demonstrating that this technique is valuable for characterizing oil weathering quickly and efficiently. Moreover, preliminary data suggest that this method can quantify traditionally uncharacterizable weathering products (specifically, highly-toxic, oxygenated hydrocarbons) by quantifying the CO_2 released after high-temperature molecular cracking. Ongoing research into this compound cracking and the methods outlined here will likely provide a more simplified and accurate way to analyze the fate of oil spills in marine ecosystems.

EFFECTS OF OIL CONCENTRATION ON THE MICROBIAL DEGRADATION OF *N*-ALKANES IN CRUDE OIL IN SEAWATER

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This study was undertaken to comprehend the rate at which microbial organisms in seawater degrade *n*-alkane compounds in varying concentrations of crude oil. Various oil concentrations (50ppm, 400ppm, 800ppm) were incubated at room temperature for 50 days in seawater collected from the Port Aransas shipping channel. Using Gas Chromatography (GC), *n*-alkanes (C_9-C_{37}) were analyzed throughout the

incubation at different time points (0, 5, 12, 29, and 50 d) to evaluate the degradation. Our results indicated that degradation rates of *n*-alkanes were correlated with oil concentrations. Concentrations decreased exponentially during the initial time intervals, but gradually plateaued over time. In 50ppm oil samples, initial alkane concentration of 134.5 ng/µL decreased to 76.7 ng/µL within the first five days, which is more than a 50% decrease, with a first-order rate constant (k) of 0.71. In contrast, 800ppm oil had a slower initial degradation rate. The initial *n*-alkane concentration of 1793.5 ng/µL decreased to 1447.1 ng/µL in the first five days. The k-value of 0.09 in the 800ppm oil is significantly lower than that of the 50ppm sample. Thereafter, degradation rates significantly decreased with increasing oil concentration, which may be due to nutrient limitation. Analyses of the nutrient concentrations and bacterial community structures in these samples are ongoing.

EFFECTS OF METHYLMERCURY EXPOSURE ON OXYGEN CONSUMPTION OF *EMERITA TALPOIDA* *(WITHDRAWN)*

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Sublethal effects of methylmercury exposure on estuarine and marine organisms and their potential impacts on food web structure are poorly understood. Increases or decreases in oxygen consumption by an organism from a baseline are indicative of stress and a measure of sublethal effects of contaminants or other stressors. In this study, we determined effects of methylmercury exposure on oxygen consumption (mg L^{-1} hr^{-1}) by the Atlantic sandcrab *Emerita talpoida*. *Emerita talpoida* was exposed to methylmercury contaminated seawater (35 psu, 1.25 ppb and 2.5 ppb) for 27 hrs after which oxygen consumption was determined. Preliminary results show that mean oxygen consumption by crabs exposed to 2.5 ppb methylmercury was nearly twice that of the crabs exposed to 1.25 ppb methylmercury; oxygen consumption of control crabs was similar to that of those exposed to 1.25 ppb methylmercury. Behavioral observations indicated that crabs exposed to the higher concentration of methylmercury were lethargic compared with control crabs and those in the lower concentration. The Texas Commission on Environmental Quality has set the allowable water column concentration of methylmercury in marine waters at 2.5 ppb for the protection of saltwater fish consumption. However these results indicate that this concentration may be high enough to cause sublethal effects in lower trophic level organisms and may affect trophic support of higher level consumers.

EFFECTS OF SALINITY ON BLUE CRAB BEHAVIOR AND FITNESS: A MESOCOSM STUDY

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Blue crabs (*Callinectes sapidus*) are an important prey species for the endangered whooping crane (*Grus americana*), which overwinters in the coastal marshes of the Aransas National Wildlife Refuge (ANWR). As blue crab availability can directly influence whooping crane behavior and fitness, it is essential to understand how environmental stressors affect the persistence of this species. Blue crabs inhabiting coastal marsh ponds at the ANWR are exposed to variable salinity levels, which have been shown to correlate with decreased freshwater inflows, decreased local precipitation (i.e., drought) and the intermittent hydrologic connection of coastal ponds to adjacent bay water. During periods of prolonged hydrologic isolation, marsh ponds experience hypersaline conditions, with salinities often

reaching 70ppt. In July of 2014, 10 high school students from Los Angeles County participated in an intensive, 2-week Earthwatch research expedition, focusing on the coastal ecology of the ANWR. The goal of this study was to determine blue crab preference, fitness and behavior across a broad salinity gradient (0-75ppt). Several blue crab behavioral attributes were recorded throughout the experiment and indicated that crab behavior, predator avoidance and habitat preference were all impacted by both low and high salinity treatments. These observations, in combination with other *in situ* environmental data, illustrate the linkages between hydrologic connectivity, marsh pond habitat quality and blue crab behavior. Additional marsh surveys of blue crab behavior *in situ,* may provide further details on how these organisms are distributed across the landscape and their relative availability to wintering whooping cranes as a valuable food resource.

A TIME ACTIVITY BUDGET FOR AMERICAN OYSTERCATCHERS (*HAEMATOPUS PALLIATUS*) AND THE FACTORS AFFECTING PARENTAL BEHAVIOR DURING THE INCUBATION AND CHICK REARING PERIODS

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American oystercatchers exhibit complementary sex roles, and parental investment in breeding behaviors influences their reproductive success. Additionally, nest and brood survival may depend on an adult's response to biotic and abiotic factors. To evaluate these factors, we conducted a behavioral study of American oystercatchers along the upper Texas Coast during the 2013 and 2014 breeding seasons. We observed breeding pairs during two reproductive periods to quantify parental behavior and determine whether parental investment influences reproductive success. Furthermore, we studied whether laughing gulls (*Leucophaeus atricilla*) nesting at oystercatcher breeding sites negatively affected parental behavior. We conducted 249 time activity budgets (TABs) on 60 nests and 187 TABs on 38 broods. Pairs engaged predominantly in incubation (52%) and resting and self maintenance (26%) during the incubation period. Pairs with successful clutches engaged in significantly less roosting. During incubation, vigilance increased significantly as laughing gulls (gulls) increased. During chick rearing, pairs engaged predominantly in resting (35%) and vigilance behaviors (29%). Vigilance significantly increased when nesting gulls were present and as gulls increased. Chick care and roosting also differed significantly in the presence or absence of nesting gulls. As the first behavioral study of breeding oystercatchers in Texas, our goal was to document how breeding behaviors and biotic factors affect oystercatcher productivity. We found that gulls colonies within the study sites were associated with negative effects on breeding behavior. Studies have found that regional factors affect oystercatcher populations, and implementing gull control measures in Texas may be a practical strategy that would benefit oystercatcher productivity.

NUTRIENT AND PHYTOPLANKTON DYNAMICS IN A EUTROPHIC LAGOONAL ESTUARY, OSO BAY, TEXAS

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Oso Bay, located in Corpus Christi, Texas, is important habitat for fish and birds, and provides numerous recreational activity options for humans. The bay has begun to exhibit symptoms of water quality degradation in response to changes in land use practices and urbanization in its watershed. Here I

present results from an on-going study (since 2011) of water quality in Oso Bay. Six sample sites are visited on a biweekly to monthly basis, and each site is influenced by different land use practices. Areas of high anthropogenic influence (i.e., wastewater effluent) have shown high levels of chlorophyll a, phytoplankton abundances, and inorganic nutrients as well as episodic low dissolved oxygen levels. Nutrient addition bioassays were also conducted parallel to water quality monitoring. Results primarily show N limitation, however, the relative influence of inorganic N and P on phytoplankton growth appears to vary on a seasonal basis, suggesting a necessity for controlling both N and P in order to reduce phytoplankton growth in the system.

NUTRIENT AND PHYTOPLANKTON DYNAMICS IN BAFFIN BAY, TEXAS: INFLUENCE OF PHYSICAL FORCING

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Baffin Bay has been experiencing signs of eutrophication in recent decades, including episodic hypoxia, dense algal blooms, increasing levels of nitrogen and phosphorus, and ephemeral fish kills. While previous studies have focused on the nutritional requirements of specific phytoplankton (e.g., *Aureoumbra lagunensis*) and conditions leading to blooms of this “brown tide” organism, little to no information exists on larger scale physical-chemical forcing that may influence phytoplankton bloom dynamics in the system. Here I report results from a field sampling program that was initiated in May 2013. Chlorophyll concentrations decrease towards the mouth of the bay, and also vary considerably on a seasonal basis. For example, during winter, low light levels and low temperature, perhaps coupled with intense water column mixing, prevent significant phytoplankton growth. In late winter/early spring, physical conditions become conducive to phytoplankton growth and large blooms develop. Finally, during summer, the southeasterly winds facilitate intrusion of low nutrient, low chlorophyll water from Laguna Madre into eastern Baffin Bay, while chlorophyll concentrations remain high in western Baffin Bay. These results point to physical forcing(s) as a significant factor influencing the phytoplankton dynamics of Baffin Bay; this is the first study to document the importance of regional-scale wind forcing for water quality in Baffin Bay, and represents a step forward in our ability to understand bloom dynamics in Baffin Bay.

FOUR YEARS OF MONITORING REVEALS A DRAMATIC CHANGE IN SEAGRASS PERCENT COVER AND SPECIES COMPOSITION IN UPPER LAGUNA MADRE, TEXAS

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In 2011 researchers at the University of Texas Marine Science Institute began a statewide seagrass monitoring program for Texas. Our monitoring program was designed to develop environmental baselines and assess the current status and trends in seagrass condition and coverage in Texas estuaries. Four years of monitoring in Aransas Bay, Redfish Bay, Corpus Christi Bay and Laguna Madre reveal dynamic and regionally distinct seagrass communities. The most dramatic change in both seagrass percent cover and species composition occurred in the Upper Laguna Madre (ULM). *Syringodium filiforme* (manatee grass) was moderately abundant and widely distributed in the north part of ULM

from 2011-2012 (13-14 % cover at ~45 stations), then abruptly declined in percent cover and spatial extent in 2013 and 2014 (0-1 % cover at ~15 stations). This species shift appears due to lower salinities that predominated through 2010 that favored *S. filiforme*. Salinities rose to higher levels in 2011 and climbed to > 50 in late 2012, effectively stalling and reversing the spread of *S. filiforme* through the Upper Laguna Madre.

DYNAMICS OF ZOOPLANKTON COMMUNITY IN TERMS OF ENVIRONMENTAL FACTORS IN GALVESTON BAY, TEXAS

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Gulf-wide coastal systems have been subjected to human and natural stressors. Intensive harvest of seafood, combined with habitat losses, has resulted in widespread concerns over possible degradation in coastal ecosystems and decline in fisheries production. Zooplankton provide a vital nexus between primary producers and higher level consumers, and can be particularly sensitive indicators of ecosystem dynamics in the ocean. Monitoring abundance, species composition and distribution of zooplankton allows us to detect ecosystem shifts. Galveston Bay, one of the largest estuarine systems in the northern Gulf of Mexico, has been subjected to human and natural stressors for decades. So far, we have limited quantitative information of variations in abundance and species composition of zooplankton community in the bay. In this study we analyzed monthly samples (using 63 µm net) collected during 2008 and 2009. Our results showed *Acartia tonsa*, *Paracalanus* spp., and *Oithonia* spp, were numerically dominant taxa and the evidence of seasonal variations in abundance and species composition over the two years. We explore these results from the perspective of integrating environmental conditions and chlorophyll *a* concentration. Zooplankton abundance and community diversity index (fisher's alpha) were significantly related to water temperature and salinity. This work has laid the foundation for an observing program of zooplankton dynamics and ecosystem assessment of estuarine systems.

TREMATODE PARASITES AS INDICATOR SPECIES IN ESTUARINE ECOSYSTEMS

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Parasites are increasingly recognized as integral members of ecological communities. Due to their high reproductive output and complex life cycles, members of the class Trematoda (flukes) are particularly influential parasites in estuarine ecosystems. In coastal marshes of Texas, at least 12 species of trematodes from 7 different families utilize the plicated horn snail (*Cerithidea pliculosa*) as a first intermediate host, fish, crabs, or molluscs as second intermediate hosts, and birds or mammals as final hosts. Larval trematodes reflect the diversity and abundance of their hosts within a community, as well

as functioning trophic linkages. They are therefore sensitive and ecologically-relevant indicator species. We sampled communities of larval trematodes in their first intermediate host, the plicated horn snail (*Cerithidea pliculosa*), at three study sites at the Aransas National Wildlife Refuge (ANWR). We found 9 species of trematodes, which had similar species richness, but markedly different infection prevalence across study sites. The site with the highest infection prevalence is considered to be the healthiest ecosystem among those sampled. Differences in infection prevalence across study sites likely reflect differential habitat usage by hosts. Because trematodes have 1 or 2 free-swimming stages in their life cycle, their populations are likely to be profoundly influenced by water stress in estuarine ecosystems, and our results reflect that. We conclude that larval trematodes are useful indicator species and we plan to make spatial and temporal comparisons using our data.

PRE-HISTORIC OYSTERS AS TIME CAPSULES IN THE NORTHERN GULF OF MEXICO: NUTRIENT SOURCES, OYSTER GROWTH, AND HUMAN LAND USE

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Oysters (*Crassostrea virginica*) were an important food resource for native peoples of the northern Gulf of Mexico, who harvested oysters and deposited waste shell and other artifacts in middens (shell mounds). Shell $\delta^{15}N$ is a proxy for oyster tissue $\delta^{15}N$, and has been used to reflect nitrogen in food sources of modern bivalves. We tested the use of shell $\delta^{15}N$ as a paleo proxy of ancient N sources, which has not been done for archeological bivalve specimens. Our results show significant differences in $\delta^{15}N$ of organic shell material between ancient (500-2000 year old) and modern oysters from the same locations near Grand Bay, Mississippi. Coupled with $\delta^{18}O$ and inorganic $\delta^{13}C$ ratios, these data can be used to link oyster growth to changes in nutrient and organic matter sources as well as salinity and temperature shifts in the ecosystem through time. Oyster age at death, which is determined by extrapolating seasonal periodicity from the sinusoidal temperature-based $\delta^{18}O$ curve along individual oyster shell margins, is used to determine length-at-age relationships, estimate growth rates, and define season of harvest. Little is known about the seasonality of coastal habitation by native people 500-2000 years ago, and season of harvest data give information on relative resource and land use by humans pre-European settlement. By combining multiple organic and inorganic stable isotope techniques we can better understand ecosystem level effects of changes in nutrient sources to estuaries and resource use by native coastal peoples.

INVESTIGATION OF POTENTIAL FACTORS THAT INFLUENCE PIPING PLOVER DISTRIBUTION ALONG THE UPPER TEXAS COAST

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Piping Plovers (*Charadrius melodus)* are a federally listed shorebird species that are continually threatened by habitat loss and human disturbance in their breeding and wintering ranges. Approximately 36% of the global population relies on the Gulf of Mexico shorelines for two-thirds of their annual life cycle. We conducted shoreline bird surveys to investigate factors that influence Piping

Plover abundance and distribution on developed versus undeveloped beaches along the Upper Texas Coast during 2012-13. Survey locations included beaches of Galveston Island and Follets Island, TX. Various factors that may influence plover abundance, distribution, behavior and location were investigated, including habitat parameters (e.g., water/tide level, beach width, and wrack percentage), recreational use (e.g., people, vehicle, and dog presence), beach raking, density of housing development and benthic prey availability. Data were analyzed using a combination of graphical, univariate, and multivariate methods to elucidate spatial and temporal trends in plover density. Our results showed a higher density of Piping Plovers (PIPL) on the more developed versus undeveloped island beaches, with 2.4 PIPL/km on Galveston versus 1.2 PIPL/km on Follets Island. Based on our preliminary analysis we identified multiple factors which influenced the patterns in distribution of Piping Plover observed during this study. Based on our study, additional research is needed to evaluate differential use of bay side and beachfront environments along the Gulf coast by Piping Plover and how use is affected by variations in coastal development and human disturbance.

HOW DOES THE ENVIRONMENT INFLUENCE POPULATION DYNAMICS OF *ACARTIA TONSA* IN THE NORTHERN GULF OF MEXICO?

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Zooplankton play a pivotal role in energy transfer from primary producers to upper-trophic levels, and are sensitive to environmental factors in the ocean. A quantitative description of population dynamics to describe abundance and biomass of zooplankton allows a better understanding of food availability to higher trophic levels and the effects of environmental changes on pelagic communities. As a numerically dominant species in the Gulf of Mexico, population dynamics of *Acartia tonsa* shows obvious seasonal variability. To understand how zooplankton respond to a changing environment, we developed an individual-based model (IBM) to study population dynamics of *A. tonsa* under settings of typical temperature and salinity in the northern Gulf of Mexico. In a simulation experiment, two peaks of annual abundance appeared in June and October, separately. The annual highest abundance occurred in June with water temperature of 24 ºC and salinity of 24. The simulated results generally follow the patterns observed in Galveston Bay. This model provides a quantitative tool to study life history and population dynamics of zooplankton, which is useful to numerically explore the dynamics of coastal marine ecosystems.

THE NESTING ECOLOGY OF THE TEXAS DIAMONDBACK TERRAPIN (*MALACLEMYS TERRAPIN LITTORALIS*)

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The Diamondback Terrapin is the only turtle in North America adapted to brackish water. The terrapin's range extends from Cape Cod, MA to Corpus Christi, TX and exhibit considerable latitudinal variation in life history attributes. Terrapin have small home ranges, but they can be difficult to locate, especially in Texas. Therefore little is known about the entire life history of terrapin. The objective of our study was to define what physical attributes are associated with nesting terrapin, and when do terrapin potentially nest in Galveston Bay, TX using two lines of evidence including habitat surveys of known nesting areas and follicle development. There is limited previous information on populations of terrapin in Galveston Bay, and terrapin have been observed nesting at each of our two study sites where we conducted nesting habitat surveys: Shell Island and South Deer Island. A Sokkia Total Station Set 330R and ArcGIS was used to help collect and project data on multiple variables used to define optimal nesting habitat characteristics, including shell hash zone width, elevation, vegetation beyond shell hash, and sediment

size and composition. Follicle size data were collected with a Sonosite® ultrasound from six different sites within Galveston Bay. Follicle development data were analyzed to identify seasonal nesting patterns. Together these data were used to estimate seasonal nesting periods and associated habitat characteristics. Habitat attributes will be used in the future to define areas that most likely support nesting in Texas.

POPULATION EXPANSION, STRUCTURE, AND MIGRATION PATTERNS FOR THE SEAGRASS *HALODULE WRIGHTII*

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Halodule wrightii is a predominantly tropical species of seagrass found throughout the Gulf of Mexico, Caribbean, Eastern and Western Atlantic. Its ability to colonize disturbed areas and high rate of rhizome growth makes it the dominant species in many locations. Seagrass meadows around the world have witnessed rapid and extensive decline, primarily as the result of anthropogenic activities. Conservation efforts can benefit from knowledge of factors that influence population processes such as expansion and migration. We have used molecular markers to investigate *H. wrightii* population processes from the Texas Gulf Coast and Bermuda. We found that while *H. wrightii* continues to expand into the Upper Laguna Madre, and decline in the Lower Laguna Madre, population connectivity remains strong. No significant proportion of the genetic variation could be attributed to differences among the basins. However, outside sources do appear to be contributing genotypes to populations at the northern and southern ends, which are in closer proximity to passes to the Gulf of Mexico. A Bayesian analysis of migration showed strongest support for a predominantly northward model of gene flow, in agreement with the dominant direction of long-shore currents.

UNDERSTANDING ALABAMA MANATEES THROUGH USE OF PUBLIC SIGHTINGS, REMOTE SENSING, AND BIOLOGICAL SAMPLING

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Prior to establishment of the Dauphin Island Sea Lab's Manatee Sighting Network in 2007, the West Indian manatee (*Trichechus manatus*) was considered accidental in Alabama waters. Validated opportunistic public sightings and direct tracking of tagged manatees in Alabama and nearby waters indicate regular seasonal use of northern Gulf of Mexico (nGOM) habitats, with some animals returning year after year. We found Mobile Bay, Alabama was among the most utilized migratory stopover or endpoints for some manatees. Opportunistic sighting reports collected as part of this program have been essential to guide direct monitoring efforts and establish a baseline for manatee locations and movement patterns. These data are coupled with photo-identification, acoustic monitoring, and environmental variables to define relationships between manatee presence and habitat attributes that will better define the temporal and spatial boundaries of local and regional resource use. These data

are needed to guide relevant management and conservation programs for manatees in Alabama and other areas outside of Florida as manatees continue to establish themselves as seasonal residents in nGOM waters.

POSTER ABSTRACTS

MODELING OF WEST INDIAN MANATEE MOVEMENTS INFORMS UNDERSTANDING OF SPECIES SPACE USE PATTERNS AND RESPONSES TO ENVIRONMENTAL CHANGES

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The study of annual scale animal movements and migration by quantifying migratory destinations and phenology can provide valuable insights into the life history of a species. Those data may in turn be particularly useful to evaluate and contextualize individual and population level responses to threats such as climate change and habitat loss. West Indian manatees (*Trichechus manatus*) in the U.S. exhibit seasonal migration patterns between essential wintertime habitat and poorly-defined summertime ranges. To better characterize intra-annual movements in terms of migratory destinations and phenology for manatees on the northern Gulf of Mexico coast, we fitted a suite of animal movement models to data collected from satellite-tracked manatees, each model corresponding to an animal movement pattern common in nature. We found that, in all cases, the best fitting movement model was a multiple-stage migratory model with three discrete migratory endpoints (one wintertime and two warm-season). Manatee movements among migratory endpoints were typically short and well defined, although timing and duration of movements varied among individuals and years, potentially due to annual environmental variation. These results are an important first step to defining warm-season manatee habitat use patterns in the northern Gulf of Mexico and are immediately useful as a baseline for examining potential effects of natural or anthropogenic perturbations on manatee distributions.

ANALYSIS OF MANATEE PERIOTIC BONE MICROCHEMISTRY AS A TOOL TO RETROSPECTIVELY TRACK MANATEE MIGRATIONS IN THE NORTHERN GULF OF MEXICO

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Understanding migrations and habitat use of West Indian manatees in the northern Gulf of Mexico (nGOM) is critical for determining their conservation needs. Satellite tags have been deployed, but these samples are limited in time, number and duration. Estimates of lifetime migration are limited to sightings of known manatees throughout their range. Chemical analysis of hardparts (i.e. otoliths) of marine taxa ranging from molluscs to mammals has enabled inference about migration pathways, population connectivity, and habitat utilization. A similar approach has the potential to aid in

determining manatee migrations retrospectively via analysis of chemical constituents in their periotic bone. Manatee periotic bones display annual growth layers, similar to those found on fish otoliths or mollusc shells, thus chemical analysis of transects across these structures may reveal age-specific migration pathways. To examine this potential, manatee periotic bones were collected from necropsied animals along the nGOM from Mississippi to the western Florida Panhandle. A laser ablation-inductively coupled plasma-mass spectrometer (LA-ICP-MS) was used to analyze the growth layers of the periotic bones to determine if variations in chemical signatures occurred among growth layers. Preliminary analysis of Sr:Ca ratios across these structures indicate they may useful as an indicator of saltwater versus freshwater residency, hence a tool to trace migration pathways. Use of this technique has the possibility of increasing understanding of manatee habitat use in the nGOM and can be coupled with stable isotope ratios to determine diet throughout migrations. Results to date will be presented along with future directions of research.

CHARACTERIZING THE BENTHIC FOOD RESOURCES AND HABITAT UTILIZATION OF BLACK DRUM (*POGONIAS CROMIS*) IN BAFFIN BAY, TX

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Black Drum, *Pogonias cromis*, are large-bodied sciaenid fish that occur throughout warm-temperate to subtropical estuaries in the northwest Atlantic and Gulf of Mexico. Black Drum constitute important commercial and recreational fisheries, with approximately 1.7 million pounds of Black Drum landed in Texas in 2010, earning ~$1.6 million. The ecology of Black Drum remains poorly characterized across the vast majority of its range, particularly along the Texas coast. The Baffin Bay Complex (BBC) supports the highest catch per unit effort of Black Drum in Texas. However, in the past year, large numbers of fish have been observed with abnormal physical characteristics and emaciated morphology. The working hypothesis is that Black Drum exhibit strong fidelity to the BBC and may have been affected by changes in availability and identity of prey resources, which in turn exhibit distribution patterns related to local ecological and water quality conditions. Seasonal benthic surveys are being conducted to determine the distribution and abundance of potential prey items. Black Drum are also being collected from throughout the BBC for visual and stable isotope analysis of gut contents. Acoustic telemetry is being used to quantify Black Drum distribution and habitat use. The results of this study will provide a better understanding of the linkages between water quality, benthic prey, and Black Drum ecology in the BBC.

ACOUSTIC TELEMETRY OF COMMON SNOOK (*CENTROPOMUS UNDECIMALIS*) IN SOUTH TEXAS

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Texas has a relatively small population of common snook. In the early 1900's Texas had a commercial fishery, but it is unclear if human or environmental effects led to the snook's demise and present small population size. While young of the year snook appear in freshwater drainages every year in South Texas, the question of where this species spawns is unresolved. In addition, information about this species' life history, movement patterns, and behavior is currently lacking in Texas. We are monitoring the movements of large Snook >30" captured and tagged in the Brownsville Ship Channel, to estimate their daily range of movements and habitat preferences. Long term monitoring is being conducted to detect any directed movements into the Gulf of Mexico to help predict the timing and direction of spawning locations. Each snook is surgically implanted with an internal, electronically-coded transmitter and is manually tracked by boat and with submerged data loggers to investigate their utilization of the Brownsville Ship Channel, local bays, and other waterways. Preliminary data shows individuals utilizing

large areas of the Brownsville Ship Channel and adjacent South Bay system, an area of high productivity. This telemetry project will provide valuable data regarding the movements and habitat use of common snook in South Texas to aid in the management of this important game species.

ARE ESTUARINE FISH (PRE)ADAPTED TO CLIMATE CHANGE?

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Oceanic CO_2 levels are predicted to increase from 380 to 1000 µatm over the next 100 years as a consequence of ocean acidification. In fish, exposure to elevated water CO_2 levels (hypercapnia) reduces the CO_2 gradient over the gills and thus CO2 diffusion from the blood into the water, causing CO_2 accumulation in the blood and respiratory acidosis. During metabolic acidosis fish restore blood pH by increase CO_2 excretion via hyperventilation. A hyperventilatory response is also seen during hypercapnia exposure and is assumed to alleviate acid-base disturbances by diminishing CO_2 accumulation in the blood. However, it is unclear how the increased water flow over the gills influences osmoregulation. Hypercapnia induced hyperventilation could potentially carry an energetic trade off tied to an increase in cost of osmoregulation. We show that gill ventilation in resting Red drum (*Sciaenops ocellatus*) increase after acute exposure to 1000 and 5000 uatm hypercapnia, respectively without any significant effect on standard metabolic rate (SMR). Our results indicate that the osmoregulatory machinery in red drum possess sufficient capacity to deal with the increase in compensatory water uptake and ion excretion during hyperventilation without any significant energetic trade off.

BISPHENOL-A, AND THREE RELATED ALKYLPHENOLS EXERT RAPID ESTROGENIC ACTIONS ON ZEBRAFISH (*DANIO RERIO*) OOCYTES TO MAINTAIN MEIOTIC ARREST

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Bisphenol A (BPA) is an alkylphenol compound used in plastic manufacturing which enters the aquatic environment through wastewater treatment plants and landfill leachates. Exposure of fish to BPA results in developmental defects, decreased hatching, and increased occurrence of the egg yolk protein vitellogenin in male fish. BPA is an estrogenic like compound (xenoestrogen) that can bind and activate the nuclear estrogen receptors, ERα and ERβ, causing changes in gene transcription (genomic mechanism). However, the ability of BPA to activate rapid nongenomic estrogen signaling to disrupt physiological processes is not known. One important nongenomic estrogen action in fish is to maintain meiotic arrest of oocytes to prevent precocious oocyte maturation through activation of the transmembrane G-protein coupled estrogen receptor (GPER). Binding of estrogens to GPER results in rapid nongenomic activation of the epidermal growth factor receptor and subsequent Map-Kinase activation. We show here that BPA and three structurally-related chemicals, tetrachlorobisphenol-A , tetrabromobisphenol-A and nonylphenol, can mimic estrogen by activating this mechanism of meiotic arrest through GPER in zebrafish (*Danio rerio*). BPA bound to zebrafish GPER and inhibited spontaneous OM of denuded oocytes. Treatment of oocytes with actinomycin D did not block the effects of BPA, suggesting that this inhibition of OM is through a nongenomic mechanism. Pharmacological inhibitors of the EGFR pathway showed that BPA also activates EGFR. The results show BPA disrupts oocyte maturation through a novel mechanism with potential adverse impacts on reproductive success.

USING LIPID STABLE ISOTOPES TO UNDERSTAND DIET ASSIMILATION IN EXPERIMENTAL ATLANTIC CROAKER

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Lipids are often removed prior to carbon stable isotope analysis in food web studies, since lipids are heavily depleted in ^{13}C compared to protein and carbohydrates. However, lipids can represent an important dietary carbon source that can be overlooked by only considering non-lipid carbon pools. Fractionation patterns of $\delta^{13}C$ between the lipid fraction of food and tissues has rarely been investigated. This research explored how $\delta^{13}C$ fractionates from lipid only portions of diet to the lipids found in liver and muscle tissues of experimentally raised juvenile Atlantic croaker (*Micropogonias undulatus*) fed three diets with different lipid contents. This study also quantified the amount of lipids (%lipid) found in muscle and liver tissue. Our results showed that very little fractionation (<1.4‰) occurred between the lipid portion of the diet and tissue lipids over the 104 day experiment. There was also little difference between $\delta^{13}C$ of lipids in muscle and liver tissues of Atlantic croaker for all three diets at day 104. When coupled with the finding that lipid content was 3.5x higher in liver tissue (~55%) than muscle tissue (~15%) yet showed very similar carbon signatures, our results could have important implications for food web and trophic level interaction studies as lipids may be an effective means of tracing diet regardless of lipid content of the study organism. Additionally, these data are being used to develop a carbon stable isotope lipid correction model, specific for muscle and liver tissues of juvenile Atlantic croaker.

SALTMARSH POND CLASSIFICATION AND FISH ASSEMBLAGE STRUCTURE AT THE ARANSAS NATIONAL WILDLIFE REFUGE

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In estuarine systems, inundation regime plays a vital role in shaping the physical and chemical characteristics of saltwater ponds. At the Aransas National Wildlife Refuge (ANWR), saltwater ponds are scattered across the coastal marsh landscape, with each pond possessing a varying degree of hydrological connectivity to adjacent estuarine waters. The timing, frequency and magnitude of connection events can directly influence abiotic and biotic components of the ponds. To determine how the degree of hydrological connectivity impacts these systems we collected physical (e.g., pond size, vegetation, soil cores, etc.), chemical (e.g., salinity, pH, dissolved oxygen, nutrient concentrations) and hydrologic data to characterize pond structure during the summer of 2013. In addition, fish assemblage data was collected via seining and minnow traps to determine the effect of pond conditions on the composition of fish assemblages in ponds. Results indicated that the *a priori* pond connectivity classifications produced definite clusters of classification groups, while fish presence-absence data did not. Though the presence of resident marsh species cannot be used to determine connectivity to the adjacent estuary, the relative abundances of those species can be used as a predictor of connectivity classification. To date, most efforts to understanding how altered hydroperiod impacts the marsh complex at the ANWR have focused on the marsh platform and not the salt marsh ponds. Our focus here on the salt marsh ponds is an important step in linking hydrologic drivers to the greater marsh ecosystem, food web dynamics and the overall coastal management practices in the region.

ENHANCEMENT OF FISH AND MACROINVERTEBRATE PRODUCTION RESULTING FROM THE RESTORATION OF OYSTER REEF HABITAT IN MATAGORDA BAY, TEXAS

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Oysters support an economically important fishery with over 2,600 metric tons harvested in Texas in 2012, generating over $21 million. In addition, oyster reefs provide various ecosystem services such as shoreline stabilization, water filtration, and exhibit increased abundances of reef-associated species. However, overharvesting, disease, and changes in water quality have depleted oyster stocks. Today, oyster reefs rank among the most threatened marine habitats in the world. Restoration efforts focus on replacing hard structure to encourage oyster reef development and restore ecosystem services. In 2013, The Nature Conservancy placed over 0.23 km^2 of hard structure in Matagorda Bay to restore a portion of the historically productive Half Moon Reef. Oysters, finfish, and macroinvertebrates are sampled seasonally using a variety of methods, including SCUBA, suction sampling, and a modified oyster dredge. The goals of this study are to: 1) quantify oyster recruitment, size frequency distribution, and disease prevalence and intensity over time; 2) quantify abundance, diversity, and biomass of fish and macroinvertebrate species compared to unstructured bottom; and 3) estimate production enhancement of fish and macroinvertebrate species compared to unstructured bottom. Determining the proficiency of the recent project in enhancing the production of economically and ecologically important species may encourage future oyster reef conservation and restoration efforts.

INVESTIGATING THE VIABILITY OF THE BRACKISH WATER CLAM *RANGIA CUNEATA* AS AN INDICATOR OF ECOSYSTEM HEALTH IN GALVESTON BAY, TEXAS *(WITHDRAWN)*

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In Texas, freshwater inflows are critical for success in both human and ecological spheres. Projections for growth in Texas predict increasing populations in coming decades which will only increase demands on the state's available freshwater. Because of this, it is imperative to understand the relationship between current environmental flow regimes and the ecosystems they support in order to inform responsible, sustainable freshwater allocation strategies in the future. When challenged with determining the balance between human and ecological needs for natural resources such as freshwater, environmental managers quantify the environment's demand by observing the responses of organisms within the ecosystem to changes in resource delivery or availability. Organisms which are sensitive to such changes are known as bioindicators. Literature suggests that the brackish water clam *Rangia cuneata* could be a bioindicator of ecosystem health in environments impacted by freshwater inflows due to its low salinity tolerance and limited mobility. In this study, *in situ* populations of *R. cuneata* in Galveston Bay were monitored on a quarterly basis for a three-year period. Metrics such as shell length, meat index and sex ratios were employed to analyze clam health as it relates to concurrent freshwater inflow. Understanding the relationship between clam health and environmental flows will help to define the viability of the use of *R. cuneata* as an indicator for ecosystem health.

MONITORING DERMO IN EASTERN OYSTER *CRASSOSTREA VIRGINICA* POPULATIONS THROUGHOUT MISSION-ARANSAS ESTUARY IN SOUTH TEXAS

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Perkinsosis, also known as Dermo, is caused by the protozoan parasite *Perkinsus marinus.* Dermo is a major cause of mortality in eastern oysters (*Crassostrea virginica*), particularly under conditions of high temperatures and salinities. This oyster and parasite are used as bio-indicators to assess the health and freshwater resources of bays and estuaries along the eastern and Gulf coasts of the United States. On a quarterly basis, 10 market and 10 sub-market sized oysters each are collected from 7 stations located along a salinity gradient throughout the Mission-Aransas Estuary. Oyster tissues are assessed to determine the distribution and severity of Dermo infection using Ray's Fluid Thioglycollate Medium (RFTM) Technique. Oysters in the Mission-Aransas Estuary have been assessed for Dermo by Dr. Sammy Ray from 2006 until his passing in 2013. With south Texas in the midst of a prolonged drought, these data will fill an important gap in our understanding of the ecological implications of reduced freshwater inflow to bays and estuaries. Our data, along with Dr. Ray's historical data and those collected throughout the Gulf of Mexico, can be found on www.oystersentinel.org.

TEXAS SEASHELLS, A NEW FIELD GUIDE

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Mollusks are an ecologically important component of the marine and estuarine ecosystem and food webs, but because of their diversity, species identification can be a challenge. Tunnell, Andrews, Barrera and Moretzsohn (2010) illustrated and discussed 900 species in *Encyclopedia of Texas Seashells*. Almost 80% of the species occur in coastal and shallow waters (20 m or 65 ft, or shallower. That book has a listing of virtually all marine mollusks likely to be found in Texas, including some rare species and those from deep waters from off Texas, but because of the comprehensive treatment, it is a large, heavy book, and not meant to be taken to the field. The last field guide for Texas seashells was published by Andrews (1992) but it has been long out-of-print. It listed and illustrated in black-and-white about 280 species of common shallow water mollusks. A new field guide with updated information on the 300 most common mollusks with full color, *Texas Seashells: A Field Guide*, will be published in December 2014 by Texas A&M University Press. It will feature most species found in bays, estuaries, coastal waters, and a few from offshore banks, including: two chitons, 156 gastropods, 4 cephalopods, 137 bivalves, and one scaphopod, in just over 100 families overall. Most species have large shells, but several micromollusks were also included. The purpose of this book is to help field biologists, students, and amateurs to identify the critters they have observed in the field.

SUITABILITY OF CALCEIN FOR MASS MARKING MARINE BIVALVE LARVAE (*CRASSOSTREA VIRGINICA*) UNDER DIFFERENT SALINITY AND TANK CONDITIONS

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Using the fluorescent marker calcein, we tested the growth and survival of mass stained eastern oysters, *Crassostrea virginica*, under different ambient salinity conditions to potentially trace larval dispersal patterns in Mobile Bay, AL. 35 million 3-day-old hatchery reared oyster larvae were stained in a 100 mg L^{-1} calcein solution for 48 hours at 15 and 26 ppt. During staining, oysters were housed in hatchery tanks filled to 2500 L. After staining, oysters at low salinity were housed in 38 L rectangular aquaria at a density of 0.5 larvae mL^{-1} at 23°C. Oysters at higher salinity were split into two sample groups. One group was maintained in 38 L rectangular tanks at the same conditions as post-staining oysters in low

salinity. The second group was maintained in 1000 L hatchery tank at a density of 1 larva mL^{-1} at 29°C. In both staining experiments 22 million larvae (63%) survived the staining process. Under low salinity conditions larvae grew 2 μm (72-74 μm) during staining, remained as D-stage larvae, and died within 2 weeks of the experiment. Under higher salinity conditions larvae grew 11 μm during staining (76-87 μm) and matured to umbo-stage larvae. Larvae in rectangular aquaria survived three weeks post-staining and did not grow past umbo-stage larvae. Oysters in hatchery tanks continued to grow to pediveliger stage and were set on concrete tiles. Mass staining of oyster larvae may be an effective tool for mark-recapture studies, but consideration should be given to salinity and tank volume conditions post-staining.

ASSESSING THE HABITAT VALUE OF ALTERNATIVE SUBSTRATES FOR OYSTER REEF RESTORATION

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Oyster reefs, formed by the generational settlement of *Crassostrea virginica*, serve as an important ecological habitat within Texas estuaries. The structural complexity of oyster reefs have shown to provide important habitat and spawning substrate for fish and mobile crustaceans and biogenic habitat for benthic invertebrates. Oyster populations have declined drastically worldwide in response to factors such as disease and environmental degradation. Oyster reef restoration is an increasingly used tool to combat further habitat losses. Oyster shell is the preferred substrate for oyster restoration; oyster larvae prefer to settle on living oysters or dead shells, likely due to chemical cues. However, with limited oyster shell available for restoration, the use of alternative substrates has become a necessity. Substrate type may affect oyster recruitment and growth, as well as structural complexity and long-term sustainability of the reef. It is less well understood how substrate type affects faunal assemblages, particularly in early stages of reef development when substrate identity may have the greatest influence on faunal recruitment and habitat use. We restored 6 acres of oyster reef in the Mission-Aransas Estuary, TX, in July 2013 using concrete, limestone, river rock, and oyster shell substrates. We are sampling the reef seasonally for 18 months to compare oyster recruitment and faunal community development associated with each substrate type. Results will provide important information on the ability of alternative substrates to promote sustainable management of oyster reef resources via restoration.

THE RESPONSE OF ENCROACHING *AVICENNIA GERMINANS* ON THE SEDIMENT BIOGEOCHEMICAL AND FAUNAL COMPOSITION OF A SOUTH TEXAS *SPARTINA ALTERNIFLORA* SALT MARSH

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Salt marsh and mangrove habitats are vital coastal ecosystems that prevent erosion, stabilize sediment, and promote diversity. The Coyote Island salt marsh lies within the shifting ecotone between black mangroves (*Avicennia germinans)* and saltmarsh cordgrass (*Spartina alterniflora*) on Mustang Island, near Port Aransas, TX. A decrease in winter freezing events have facilitated mangrove invasion into more northern habitats, where they have displaced *Spartina*. We sampled three sites that varied in the relative dominance of *Spartina* and *Avicennia* to examine how these systems differ biologically and

chemically. Measurements of sediment chemistry and benthic faunal diversity were collected in mid-March and early-April. The site dominated by *Spartina* was found to have higher soil moisture (35.8 ± 2.7 %) and contained the highest benthic and epibenthic diversity. Mangroves were found to have the lowest infaunal diversity (3 taxonomic groups). The mixed *Avicennia -Spartina* site contained a higher abundance of polychaete worms compared to the *Avicennia* and *Spartina* sites ($p = 0.011$). Most abundance is attributed to the rapid colonizing polychaete family *Capitellidae*. TOC for the mixed site was significantly different ($p < 0.01$) between March (2.8%) and early-April (5.6%). The difference in faunal utilization of mangrove and marsh systems likely reflects differences in sediment biogeochemistry between the two habitats, which include such parameters as sediment redox, TOC, porewater nutrients and salinity, and soil moisture. Consequently, the invasion of mangroves into marsh habitats may initially produce a much complex system with benefits to an increased number of dependent fauna with varying ecosystem services.

ECOSYSTEM ENGINEERING CAPACITIES OF *AVICENNIA GERMINANS* AND *SPARTINA ALTERNIFLORA* IN THE MANGROVE/MARSH ECOTONE UNDER FREEZE AND SEA LEVEL RISE STRESSORS

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We will be conducting an experiment in Port Fourchon (LA), where the mangrove/salt marsh ecotone is well established. In mangrove, marsh, and mixed vegetations, we will monitor sediment accretion and overall elevation change, which is vital to the persistence of both vegetations in rising seas; above- and belowground production of *A. germinans* and *S. alterniflora*; carbon and nitrogen storage in sediments and living tissue; and abiotic sediment characteristics. *In situ* sea level rise (SLR) and severe freeze treatments will be implemented to account for significant, imminent stresses in the near future. SLR will be simulated using weirs to retain water from flood tide at least 20 cm above low tide levels, while otherwise fluctuating with natural tides. Severe freeze events will be simulated using a targeted "cut and paint" herbicide application to mangrove tree trunks in treatment plots, thus maintaining tree root structure as it deteriorates.Studies in the mangrove/marsh ecotone suggest healthy mangrove sites will provide greater sediment accretion, greater nitrogen storage, but less potential for carbon sequestration than salt marsh sites (Comeaux et al. 2012, McKee & Rooth 2008). I expect to find distinct sediment characteristics between vegetations, largely based upon their relative abilities to funnel oxygen into the rhizosphere. SLR is expected to limit vegetations' engineering abilities similarly, while severe freeze events will result in more dramatic shifts of all metrics in plots with greater mangrove compositions.

DAMAGE AND RECOVERY OF BLACK MANGROVE (*AVICENNIA GERMINANS*) FROM THE JANUARY 2010 FREEZE ON THE LOUISIANA COAST

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Black mangrove (*Avicennia germinans*) is a tropical shrub/tree species with some frost tolerance, allowing it to expand into saline marsh habitat at its northern range during periods of warmer than average winters, changing the dynamics of biomass production and potential carbon sequestration. However, a January 2010 freeze resulted in widespread damage to mangroves on the Louisiana coast. Temperature sensors previously deployed within the canopy of two black mangrove stands 80 km apart

logged minimum temperatures on 9-11 January 2010 of -3°C to -7°C, resulting in leaf burn and stem die-back of 1-2 m tall black mangrove plants. On 22 January 2010, the effects of the freeze at Fourchon were observed to be widespread but irregular. The tallest mangroves appeared unaffected, whereas some adjacent plants had total leaf burn and appeared dead. By May 2010 many plants were sprouting from the base. At this time, five individual mangrove plants were identified at each site in each of three categories: green, totally denuded, and denuded with sprouting. A total of 30 plants were tagged. Four months after the freeze, the sprouting plants had regained almost 40% of their height. Four years later, the sprouted plants were near 90% of their original height and growing at a rate of 20 cm/yr. The ability to quickly recover from freezes allows black mangrove to continue expanding into salt marshes of Louisiana. These results emphasize the need to understand the tipping points of foundation species change as climate changes in Gulf of Mexico coastal environments.

CARBON AND NUTRIENT DYNAMICS OF DISTURBED SEAGRASS ECOSYSTEMS

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The question of carbon is of the utmost importance given that as of 2013, the global average of atmospheric carbon dioxide reached an unprecedented 396.48 parts per million (ppm), which was the highest level in the last 800,000 years (Luthi *et al* 2008). Anthropogenic pressures are negatively impacting the aquatic and coastal ecosystems important in carbon sequestration. Disturbance is potentially turning long term carbon sinks into a source. To date, there is very little research on the carbon and nutrient dynamics of seagrass ecosystems post disturbance that governing agencies can use to make educated decisions as to their management strategies. This study seeks to close at least some of this information gap, and allow the quantification of Carbon (C) and nutrient stocks and fluxes of disturbed seagrass meadows. Study plots will be set up in communities of Turtle Grass(*Thalassia testudinum*) in Lower Laguna Madre that mimic anthropogenic disturbance. The sites will be monitored for soil C and nutrient contents of both the disturbed and undisturbed areas to estimate the rate of post-disturbance decomposition of the historically sequestered carbon. Our hypothesis is that the disturbance of these areas will show a reduction of sequestered C and nutrients, and that short term regrowth of these areas will not return them to the pre-disturbance carbon levels. This study hopes to provide the information needed to strike a balance between the growing need of the population with the need for these areas as they relate to the global carbon cycle.

COMPARING NEKTON COMMUNITIES BETWEEN FRINGING COASTAL MARSHES AND ADJACENT SEAGRASS BEDS

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Trawls and fyke nets are common sampling methods used in aquatic ecosystem studies. Sampling by trawls, which can be used to target seagrass-associated communities, is fundamentally different from sampling with fyke nets, which are positioned at fringing marsh edges to passively collect marsh organisms as the tide recedes. Thus, the two methods potentially differ in efficiency with respect to the numbers and types of organisms they can collect. In this study, we use a two-year data set to compare the community structure of marsh- and seagrass-associated nekton among five sampling sites in the

northern Gulf of Mexico. We compare four metrics among sites, habitats, and sampling equipment: (1) total nekton abundance; (2) total abundance excluding the daggerblade grass shrimp *Palaemonetes pugio*, which is a numerically dominant species that may mask abundance patterns of other species; (3) total abundance of blue crabs and penaeid shrimp, the most abundant species after *P. pugio* and of commercial importance; and (4) nekton community structure. Variations in community structure between habitats are discussed in light of differences in gear efficiency and inherent differences in the structural complexity and accessibility of each habitat to mobile fish and invertebrates. Our findings contribute to an emerging understanding of the potential for functional redundancy between fringing salt marshes and seagrass meadows, with emphasis on implications of this redundancy – or lack thereof – for commercially important species.

DIVERSITY AND TAXONOMIC RICHNESS OF MACROALGAE AMONG CENOTES OF THE EASTERN YUCATAN PENINSULA

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The topography of the Yucatan Peninsula is characterized by a series of karstic aquifers called cenotes. Cenotes transport water across the peninsula to the sea and provide freshwater for consumption and recreation. Urbanization and tourism bring increased stress to these delicate systems, therefore the objective was to provide baseline biological knowledge of cenotes for potential conservation and future scientific studies. In May 2011 and May 2013 studies were conducted in Akumal, Mexico, where macroalgal diversity and richness in cenotes were assessed and correlated with hydrographic parameters. For both years, a combined total of 10 cenotes were sampled, and in 2013, Akumal Bay was sampled as a reference site. There was a significant correlation between taxonomic richness and salinity (2011: $R^2 = 0.71$, $p = 0.00232$; 2013: $R^2 = 0.8$, $p = 0.00024$) and between diversity and salinity ($R^2 = 0.87$, $p = 0.00002$) from each site. The four most saline sites, Akumal Bay (33 taxa), Yal Kú (39 taxa), Cenote Manatee (28 taxa) and Yal Kú Chico (27 taxa), were the most diverse. The freshest three sites, Cenote Balam (3 taxa), Laguna de Cocodrilo (4 taxa) and Laguna de Uxuxubi (4 taxa), were the least diverse. This study is the first to introduce salinity as a mechanism driving diversity and taxonomic richness of macroalgae in these systems.

ORGANIC MATTER LOADING AND HETEROTROPHIC BACTERIAL ABUNDANCE IN A EUTROPHIC, LAGOONAL ESTUARY (OSO BAY, CORPUS CHRISTI, TX)

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Oso Bay is a shallow urbanized estuary (~1-2m) that is poorly flushed due to reduced connections to neighboring bays. Oso Bay regularly experiences symptoms of eutrophication, high chlorophyll *a* levels and episodic hypoxia events. Exceptionally high dissolved and particulate organic matter (DOM, POM) concentrations have been observed in parts of Oso Bay. However, the processes that lead to the production of the DOM/POM in Oso Bay and other coastal embayments are poorly understood. Heterotrophic bacteria play critical roles in transformation and remineralization of organic matter, production of organic matter and food source for protozoa. Here we will present water quality and

bacterial data collected over the last three years. This research will assess total bacterioplankton concentrations and how those measurements may be correlated specifically to environmental parameters and DOM/POM. Data indicate that water column inorganic nitrogen concentrations are low compared to DON throughout much of Oso Bay, with the exception of two highly impacted sites. High levels of DOC and TOC are routinely observed at key tributaries. The relationships between environmental parameters, water quality and heterotrophic bacteria will be discussed.

RELATIONSHIP BETWEEN THE ZOOPLANKTON COMMUNITY AND WATER QUALITY IN AN URBANIZING, EUTROPHIC ESTUARY (OSO BAY, TX)

*Anne-Marie Gavlas; Texas A&M University, Corpus Christi, TX

Oso Bay (Texas) is a eutrophic, microtidal estuary with a watershed that has undergone extensive urbanization over the past 1-2 decades. Water quality degradation has been noted in parts of the system, though few studies have assessed the influence of water quality on higher trophic levels in this system. Here I present preliminary results from a study that seeks to understand the relationship between the zooplankton community of Oso Bay and the aforementioned water quality conditions. Meso- and micro-zooplankton samples are being collected monthly at 5 sites in Oso Bay in conjunction with the water quality study. The inflows from the tributaries at these sampling sites are representative of some of the varied activities occurring in the watershed. Mesozooplankton samples are collected monthly using a 64µm mesh so as to include nauplii and other larvae in the samples. Preliminary data show differences in abundance, diversity, and community composition of zooplankton between the 5 sites. This information will provide a better understanding of how differences in water chemistry due to anthropogenic activities are affecting the base of the marine food web.

COASTAL DUNE LAKES OF NORTHWEST FLORIDA: MULTIVARIATE ANALYSIS OF WATER QUALITY DATA TO ESTABLISH LAKE CLASSIFICATION AND PROPOSE ECOSYSTEM SPECIFIC NUTRIENT CRITERIA *(WITHDRAWN)*

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The coastal dune lakes of northwest Florida are globally rare ecosystems with intermittent connections to the Gulf of Mexico that result in a mix of characteristics typical of both freshwater and estuarine systems. Despite this distinct character, the coastal dune lakes are generally viewed as freshwater lakes for management purposes, and are not protected by site-specific numeric nutrient criteria. This study proposes a classification framework and nutrient criteria for 13 coastal dune lakes in Walton County, Florida through the complementary multivariate analyses of water quality data from 2003-2013 using principal component analysis (PCA), cluster analysis (CA), and hypothesis testing with a similarity profile (SIMPROF). A classification analysis using 10-year medians of the data indicated three lake classes: fresh, mixed, and estuarine. A temporal analysis, using the annual medians, revealed that the lakes generally did not change class over ten years, with the exceptions likely the result of outlet management activities. A comparative analysis showed that the coastal dune lakes are more similar to the bayous and bay segments of the regional estuary, Choctawhatchee Bay, for which site-specific numeric nutrient criteria are defined, than they are to Florida's freshwater lakes, which are managed according to state-wide numeric nutrient criteria. These results can be used by local managers to adopt appropriate nutrient criteria for the coastal dune lakes, and more broadly, this combination of complementary

multivariate analysis methods may be employed by regional coastal resource managers to assess current management practices and to guide the selection of ecosystem specific nutrient criteria.

ASSESSING THE ABUNDANCE AND DISTRIBUTION OF MICROPLASTICS IN A GULF OF MEXICO ESTUARY

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Plastic debris has significant environmental and economic impacts in marine systems. One exponentially increasing source are microplastics (i.e. plastic pellets, plastic fragments, scrubbers, plastic flakes) which range in size from 1 µm to 5 mm. First studied in the 1970s along the east coast of North America studies on microplastics have since been conducted along both coasts of North America, the Caribbean, southern Africa, the Mediterranean, Europe, Antarctica and Asia. Microplastics have been documented to have both direct (i.e. via consumption) and indirect (i.e. persistent organic pollutant toxicity) effects on organisms. Microplastic debris originates from the degradation of packaging and resin pellet manufacturing. In marine environments they can be transported over long distances by ocean currents and eventually be deposited in coastal sediments (i.e. beaches, marsh, seagrass beds, reefs). Despite the increasing interest in microplastics, research on its abundance, distribution and impacts in the Gulf of Mexico is limited. This study aims to contribute to filling this gap in knowledge by assessing the abundance and distribution of microplastics in Gulf coastal habitats.

USING SEDIMENT GRAIN SIZE ANALYSIS IN CONJUNCTION WITH FORAMINIFERAL ASSEMBLAGE PATTERNS AS PROXIES TO DISCERN DROUGHT AND WATER BALANCE ISSUES IN NUECES BAY, SOUTH TEXAS.

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Sediment cores collected from Nueces Bay, an incised bay/estuary system located in South Texas, were used to examine the relationship between sediment particle size patterns and the distribution of foraminiferal assemblages, as an indicator of environmental change. Foraminifera are typically abundant in marine and estuarine environments. At the genus and species levels, assemblage patterns are indicative of climatic and environmental conditions present at the time of their deposition. Therefore, they make excellent indicators for assessing past changes in environmental conditions. The sediment grain size distributions, and the foraminiferal assemblages in surface samples are reflective of current and recent events in the estuary and bay. However, down core analyses of the same parameters are variable, and indicative of past environmental changes in the system. This work documents some of the natural variability that has affected the Nueces Bay system resulting from climatic events such as periods of drought, high precipitation, and resulting runoff. It also helps to explain the results of changes in freshwater inflows, due both to drought, and also to the anthropogenic diversion of freshwater inflows from the Nueces River and delta areas. This work will also show that grain size and composition of foraminiferal assemblages can be effective proxies for establishing both spatial and temporal indicators of past and present bay and estuary health.

CONTROL OF ORGANIC MATTER QUALITY ON NITROGEN CYCLING AT THE SEDIMENT-WATER INTERFACE IN COASTAL SYSTEMS

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Productive coastal marine ecosystems are sites of intense organic matter (OM) cycling. OM spans a range of reactivity, from labile to refractory forms; however, little is known about how OM quality affects microbially-mediated OM transformations in sediments. In our study, we quantified how labile versus refractory OM affected microbial respiration by measuring gas and nutrient fluxes at the sediment-water interface. We measured oxygen (O_2) and nitrogen (N_2) gas fluxes as well as ammonium (NH_4^+), phosphate (PO_4^{3-}) and nitrate (NO_3^-) fluxes in whole cores collected from Copano Bay, Texas in March 2014. Cores were treated with either a labile (*Chlorella* algae) or refractory (*Spartina*) OM addition and placed in a flow-through incubation experiment. O_2 consumption peaked at -2490 ± 658 and -769 ± 105 µmol hr^{-1} m^{-2} in the labile and refractory treatments, respectively. Maximum N_2 flux was 493 ± 196 and 208 ± 20 µmol hr^{-1} m^{-2} in the labile and refractory treatments, respectively. Cores treated with *Chlorella* also had the highest NH_4^+ (334 ± 177 µmol hr^{-1} m^{-2}) and PO_4^{3-} (4.22 ± 1.14 µmol hr^{-1} m^{-2}) effluxes relative to cores containing *Spartina* (NH_4^+: 8.06 ± 9.10 µmol hr^{-1} m^{-2}; PO_4^{3-}: 0.22 ± 0.27 µmol hr^{-1} m^{-2}). NO_3^- fluxes were inconclusive alone, but coupled with N_2 fluxes were indicative of enhanced denitrification in the *Chlorella* cores. Our results indicate that labile OM enhances sediment bacterial respiration including denitrification. Changes in these processes affect nitrogen availability and ultimately influence primary production in estuarine systems.

GULF OF MEXICO SPECIES INTERACTIONS (GOMEXSI) DATABASE: CURRENT STATUS AND FUTURE PLANS FOR A GULF DATA RESOURCE

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Much attention has been devoted to measurement and cataloguing of biodiversity throughout the world and in the Gulf of Mexico over the past 30 to 50 years. However, systematic recording and cataloguing of species interactions, or biostructure, has received far less attention. Nevertheless, it is this biostructure that defines and governs the flow of energy through the ecosystem. The Gulf of Mexico Species Interaction (*GoMexSI*) database and web application (gomexsi.tamucc.edu), is striving to rectify this situation. Response has been excellent with approximately 215 registered users to the webpage (i.e. those seeking to query the data). Collecting, extracting, and archiving data from published and un-published resources (758) and data contributors (21), we now have trophic interaction data for fishes from 61 sources, with a total of 41,349 interactions from 1,513 unique interactors. In the future we will add trophic data for other taxa including sea and shore birds, marine mammals, sea turtles, crustaceans, and others. Beyond trophic interactions we intend to include parasitic, amensal, commensal, and mutualistic relationships. We are currently examining data shortfalls through taxonomic and spatial gap analyses, and adding new data through stomach analyses at USF and TAMUCC. We expect that ichthyologists will find the data useful for study of biotic interactions among fishes and other taxa. Marine ecologists have begun to use the data for development of ecosystem based approaches to

management of fisheries. The data are beginning to provide value to fisheries modelers using Ecopath, Atlantis or OSMOSE models, which require highly resolved diet data.

ZOOPLANKTON MONITORING IN THE MISSION-ARANSAS RESERVE

Rae F. Mooney, Cammie J. Hyatt, and Edward J. Buskey; Mission-Aransas National Estuarine Research Reserve and the University of Texas Marine Science Institute

The Mission-Aransas Reserve began a long term zooplankton monitoring program in 2009, to build upon the existing system wide monitoring program (SWMP). The goal of the program is to determine the distribution and abundance of zooplankton groups within the year and over longer time scales. Zooplankton tows are taken monthly during the SWMP trips at all 5 Reserve sites. At each SWMP site, YSI sondes collect water quality data every 15 minutes; data includes salinity, temperature, pH, dissolved oxygen, chlorophyll a, and turbidity. Zooplankton groups counted are mero- and holoplankton. Many meroplankton species are important recreational and commercial species, such as blue crab, and many holoplankton species are important food sources in the marine food web, such as copepods. Overall, copepods make up the largest group of zooplankton at all sites. Meroplankton and copepod groups are the most diverse at the Ship Channel site. Following a major storm event in 2010, diversity of meroplankton declined with barnacles making up the largest group. Zooplankton monitoring will continue as a part of the Mission-Aransas Reserve SWMP. This data will be especially valuable to monitor changes over time, such as major storm and drought periods and anthropogenic changes, such as the opening of cedar bayou.

DATA TO DECISIONS: SUPPORTING EFFECTIVE COASTAL MANAGEMENT

Kelly M. Darnell, Melissa Baustian, Ann C. Hijuelos, Leland C. Moss and Tim J.B. Carruthers; The Water Institute of the Gulf, Baton Rouge, LA

The Water Institute of the Gulf is a not-for-profit independent research institute dedicated to advancing the understanding of coastal, deltaic, river and water resources along the Gulf Coast and around the world. Our mission supports the practical application of innovative science and engineering for developing tools to achieve sustainable coasts and deltas, options for supporting coastal communities and strategies for sound water resource management. Through identifying expertise and forming collaborations with partners across disciplines of academia, NGOs, industry and government agencies, The Water Institute is able to focus efforts on crucial challenges to coastal systems and build strategic capacity to support management and restoration. Current research in the Coastal Ecology division includes developing a System-Wide Assessment and Monitoring Program for coastal Louisiana and Habitat Suitability Indices for key fisheries species, tracking carbon cycling in marsh systems, examining the wave attenuation potential of mangroves and determining the ecosystem services provided by submerged aquatic vegetation to fisheries species. This information will be used to inform and improve predictive modeling capabilities for future coastal scenarios and inform the development and implementation of best management practices for a sustainable coastline.

OUR GLOBAL ESTUARY: A STRATEGY FOR SCIENCE-BASED ESTUARINE OBSERVATION AND PREDICTION NETWORKS

[1]Edward J. Buskey, [2]Antonio Baptista, and [3]Megan Davis; [1]University of Texas Marine Science Institute, Port Aransas, TX, [2]Oregon Health & Science University, Portland, OR, [3]Harbor Branch Oceanographic Institute, Fort Pierce, FL

Our Global Estuary is an initiative to address estuaries as critical local and global resources. The Our Global Estuary U.S. National Workshop was convened in October 2013 with estuarine scientists, resource managers, coastal and ocean observing system managers and educators to discuss the state of estuary science, technology, management and policy. The primary purpose of the workshop was to generate discussion on how knowledge generated in the study and caretaking of individual estuaries could be collected and made available to support efforts in other estuaries and for all estuaries worldwide. A summary of the outcomes and consensus points will be presented, along with plans for an international meeting in 2015.

Things to Do in Port Aransas

Restaurants

Jay's Seafood and Spaghetti Works

910 S. Alister St., Port Aransas, TX, (361)749-5666

Jay's offers a variety of fresh seafood, sandwich, pizza and pasta dishes, with a great soup and salad bar.

La Playa

222 Beach St., Port Aransas, TX, (361)749-0022

La Playa features many delicious Mexican dishes as well as fresh seafood.

Kody's

2034 Texas 361, Port Aransas, TX, (361)749-8226

Try Kody's for a fast and easy burger, sandwich, or seafood plate.

FOR BREAKFAST OR BRUNCH

EAT'S

112 E. White St., Port Aransas, TX, (361)749-4286

EAT'S is a cute little pastry/coffee shop with several breakfast or brunch options and a coffee bar.

Outdoors

UTMSI's Wetlands Education Center (WEC)

Directly behind the UTMSI Visitor's Center
Take a 30 minute stroll around the Wetlands Education Center to see natural Texas wetlands vegetation.

Charlie's Pasture Nature Preserve
Entrance on Highway 361 (on the right just after the Sharkey's sign)
The Nature Preserve has boardwalks through the marsh with birding look-outs along the way.

Beach!
Drive onto the beach from Cotter St., Beach St., Lantana St., Ave. G., or Access Rd. 1
Check out one of the best beaches in south Texas! Use the Beach St. entrance for the pier ($2 to walk out on the pier)

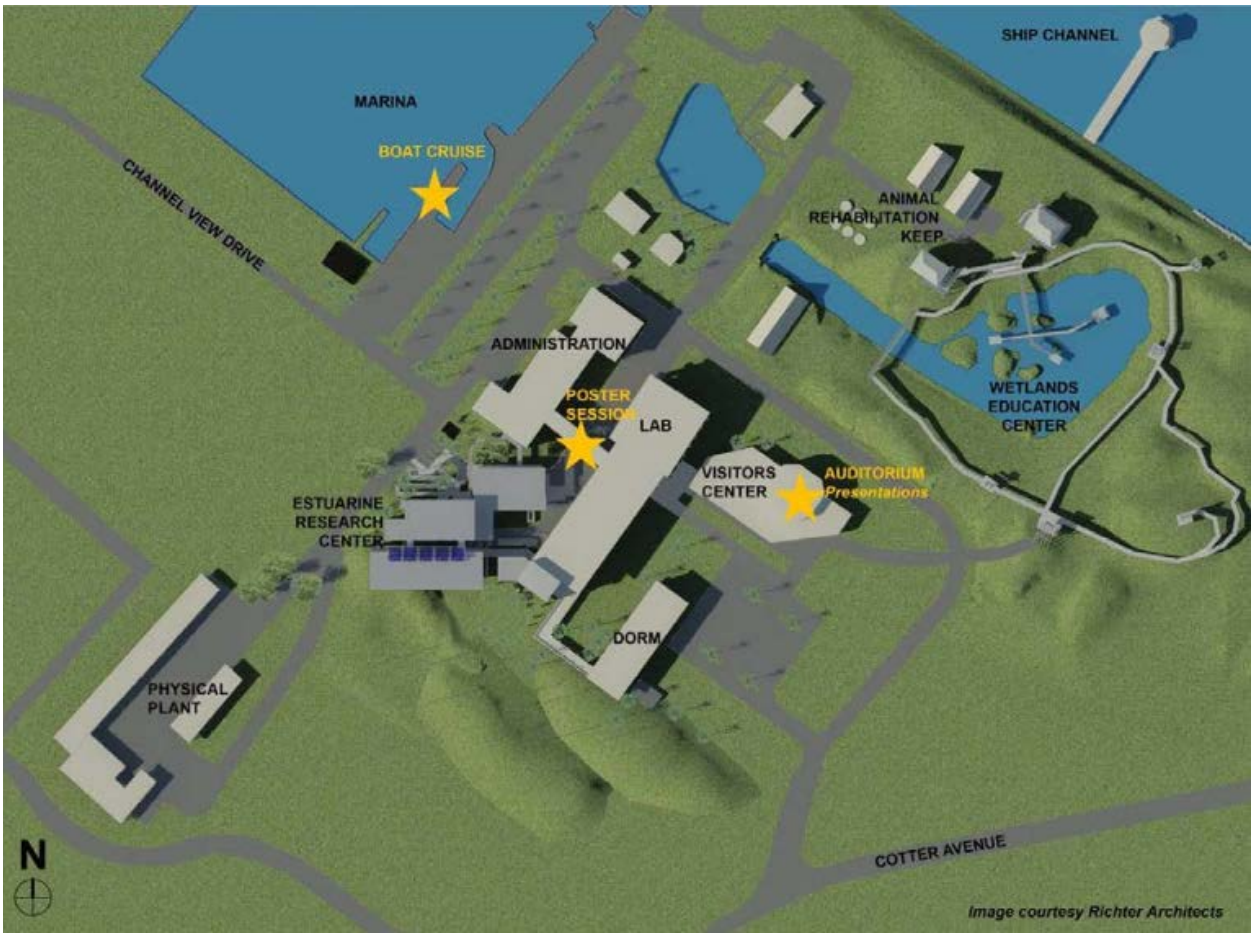
Greening the Meeting

Bringing people together for a large meeting like the Gulf Estuarine Research Society meeting can create significant environmental impacts. As professionals in our field, it is important for the Mission-Aransas Reserve and the University of Texas Marine Science Institute to lead by example. The following list highlights the steps we've taken to reduce the impact of GERS 2014:

- Providing paper coffee mugs (please keep and reuse throughout day if possible)
- Convincing vendors to use Styrofoam alternatives
- Reusable bags for meeting materials
- Reusable nametag wallets
- Recycling bins provided by the UTMSI Green Team
- Limited paper use through duplex printing where possible
- Using materials with as much recycled content as possible
- Providing electronic copies of meeting materials to registered participants
- Contracting with local vendors whenever possible

To learn more about the Mission-Aransas Reserve and UTMSI efforts to reduce their environmental impact, check out the UTMSI Green Team (www.utmsi.utexas.edu/greenteam)!

Map of the UT Marine Science Institute



UTMSI Street Address:
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