28th IICE

Climate Change & the Coast

The Interdisciplinary Environmental Association (IEA) and Louisiana State University Shreveport (LSUS) present the 28th International Interdisciplinary Conference on the Environment (IICE) which is being held virtually from October 19-21, 2023.

IEA Interdisciplinary Environmental Association

LSUS SHREVEPORT

Hopin Link

https://hopin.com/events/28th-international-interdisciplinary-conference-on-the-environment/registration

Schedule of Events

CDT -500 Shreveport, Louisiana Local Time (CDT)

*Student presentations

Date	Session	Title	Speaker	Time CDT
Oct. 19, 2023	Greeting	Presidential Address	Greg Cronin	9:00
Oct. 19, 2023	Navigate Hopin	Hopin Logistics	Olivia Cason	9:15
Oct. 19, 2023	Networking			9:30
Oct. 19, 2023	Grant Writing Workshop	ABC's of Grant Writing	Heather Carpenter, Louisiana State University Shreveport	10:00
Oct. 19, 2023	GIS Introductory Training Workshop	GIS Workshop for Environmental Research and Climate Change	Peter Siska, Louisiana State University Shreveport	11:00
Oct. 19, 2023	Lunch			12:00
Oct. 19, 2023	Urban Environmental Studies	Assessing ecosystem services in peri-urban Mediterranean wetlands	Olivia Cason*, Universitat Autonoma Barcelona	13:00
Oct. 19, 2023	Urban Environmental Studies	Urban green spaces: How do development and management practices influence immigrant socio-economic integration?	Lorenzo Maggio Laquidara*, Duke Kunshan University	13:30
Oct. 19, 2023	Urban Environmental Studies	The moral dimensions of urban heat islands and walkability	Savannah Stevens*, University of North Texas	14:00
Oct. 19, 2023	Urban Environmental Studies	Open space development and restoration in urban environments: Problems and solutions	Declan Hogan*, Jamie Robbins*, Catherine Feeley-Leetz*,	14:30

			Manhattan College	
Oct. 19, 2023	Break			15:00
Oct. 19, 2023	Agriculture and Horticulture	Emergence of bittercress (*Cardamine flexuosa*) and oxalis (*Oxalis corniculata*) through rice hulls applied at four different depths in nursery containers	Heather Kalaman, University of Florida	15:30
Oct. 19, 2023	Agriculture and Horticulture	Effects of biochar-compost product blends on switchgrass growth rates	Cameron Crowder*, Saint Edward's University	16:00
Oct. 19, 2023	Agriculture and Horticulture	Building a program for horticulture professionals on climate–smart landscaping practices in Florida	Kara Krueger, Palm Beach County Extension Service, University of Florida/ IFAS.	16:30
Oct. 19, 2023	Health	Mitigation of anthropogenic effects on zoonoses: Global and local considerations	Lori Zeringue Crow*, Louisiana State University Shreveport	17:00
Oct. 19, 2023	Health	People are burning out faster than the fires: USA wildland firefighters resilience, health, and collaboration in worsening fire seasons	Adelmut Duffing Romero*, Universitat Autonoma Barcelona	17:30
Oct. 19, 2023	Break			18:00
Oct. 19, 2023	Energy	Potentials of converting organic waste to energy in Kumasi Metropolitan Assembly, Ghana	Esi Dadzie, University of Science and Technology, Kumasi, Ghana	18:30
Oct. 19, 2023	Energy	A public response-centered framework for the study of energy injustice in the emerging renewable energy sector	Idowu Kunlere*, University of Delaware	19:00
Oct. 19, 2023	Energy	The green energy transition: Implications for Africa's environment and development	Joseph Cudjoe, Florida Gulf Coast University	19:30
End of Day 1				**20:00**

Date	Session	Title	Speaker	Time
Oct. 20, 2023	Climate Change and the Coast	Evaluating changes in ecosystem dynamics in coastal regions of Louisiana	Peter Siska, Louisiana State University Shreveport	9:00
Oct. 20, 2023	Keynote Address	The LSU Center for River Studies	Clinton Willson, Louisiana State University	9:30
Oct. 20, 2023	Break			10:30
Oct. 20, 2023	Keynote Address	Antarctica and the Coast: A birth story from the ends of the earth	Elizabeth Rush, Brown University	11:00
Oct. 20, 2023	Lunch			12:30
Oct. 20, 2023	Keynote Address	Geospatial estimation of the impact of Deepwater Horizon oil spill on plant oiling along the Louisiana shorelines	Pierre Goovaerts, BioMedware	13:30
Oct. 20, 2023	Climate Change and the Coast	Fostering stewardship in coastal communities through watershed education and civic engagement	Lara Milligan, Michael D'Imperio, UF/IFAS Extension Pinellas County, Tarpon Springs, Florida & UF/IFAS Extension Sarasota County, Sarasota, Florida	14:30
Oct. 20, 2023	Keynote Address	Coral 'midwifery' and empowering coastal communities to improve coral restoration effectiveness in a changing world	Margaret Miller, SECORE International	15:00
Oct. 20, 2023	Break			16:00
Oct. 20, 2023	Climate Change and the Coast	Coastal cities and climate change: Lessons from moral ordering on competing interests in urban environments	Shane Epting, Missouri University of Science and Technology	16:30
Oct. 20, 2023	Climate Change and the Coast	Epistemological formation in the interdisciplinary collaboration: Cross-country studies on seagrass restoration projects	Keiko Yokoyama, Hiroshima University	17:00
Oct. 20, 2023	Climate Change and the Coast	Assessing the potential impact of flood-induced-climate change on Louisiana's coastal communities, ecosystems, and infrastructure	Dorcas Twumwaa Gyan, University of Cape Coast	17:30

Date	Session	Title	Speaker	Time
		through the lenses of GIS and remote sensing		
Oct. 20, 2023	Climate Change and the Coast	Zooming in on Gulf Coast flood risk and exposure: Measuring the relationship between neighborhood-level flood risk and unique place-based factors	Anissa Hyde*, Louisiana State University	18:00
Oct. 20, 2023	Climate Change and the Coast	Influence of climate change on the physical parameters of Biscayne Bay, Florida, USA	Elizabeth Janz*, University of Miami	18:30
Oct. 20, 2023	Climate Change and the Coast	Migration with dignity: Climate refugees among small island nations	Kay Athanasidy*, SUNY Potsdam	19:00
End of Day 2				**19:30**

Date	Session	Title	Speaker	Time
Oct. 21, 2023	Climate Change and the Coast	Optimizing lighting performance and visual comfort in Florida: An innovative approach to auxetic shading design	Jingyuan Shen*, University of Florida	9:00
Oct. 21, 2023	Climate Change and the Coast	Climate and ocean change education: Methods, case study and resources	David Crookall, Pimnutcha Promduangsri, Inter-Ocean-Climate School, Université Côte d'Azur	9:30
Oct. 21, 2023	Climate Change and the Coast	Climate change education for children in East Baton Rouge Parish, Louisiana	Christine Karagu*, Southern University and A&M College	10:30
Oct. 21, 2023	Coastal Botanical Drawing Workshop	Coastal Botanical Drawing Workshop	Clair Gaston, Artist and Naturalist	11:00
Oct. 21, 2023	Lunch			12:00
Oct. 21, 2023	Resume Building and Cover Letter Writing Workshop	Resume Building and Cover Letter Writing Workshop	Areceli "Sally" Perez-Ramos, Career Services Expert	13:00
Oct. 21, 2023	Climate Change and	Testing of primers to detect oil spill	Illya Tietzel,	14:00

	the Coast	microbe *Alcanivorax borkumensis* using PCR	Southern University at New Orleans	
Oct. 21, 2023	Climate Change and the Coast	Resilience buildings in the era of climate change in the USA	Mehdi Ghiai, University of Louisiana at Lafayette	14:30
Oct. 21, 2023	Corporate Environmentalism	Does local social capital encourage profit organizations to go green?	Hayeon Jo*, Louisiana State University Shreveport	15:00
Oct. 21, 2023	Break			15:30
Oct. 21, 2023	Watersheds and the Coast	The historic influence of landscape and environment on development in the Halifax	Michael A. Reiter, Bethune-Cookman University	16:00
Oct. 21, 2023	Watersheds and the Coast	Relationship between land use and water quality in a tropical urban catchment of the Congo basin: Source to sink buffer scale approach	Sani Zouera*, University of Kinshasa	16:30
Oct. 21, 2023	Watersheds and the Coast	Analyzing negative human-shark interaction trends at the shark bite capital of the world	Tyler Bowling*, University of Florida	17:00
Oct. 21, 2023	Watersheds and the Coast	Connecting the dots: A process for mapping the socio-ecological network of sediment retention services in Puerto Rico and beyond	Mariam Valladares-Castellanos*, Louisiana State University	17:30
Oct. 21, 2023	Watersheds and the Coast	A logic model approach to evaluating how ecosystem services and equity fit into benefit-cost analysis frameworks	Fahmida Akhter*, Louisiana State University	18:00
	Break			18:30
Oct. 21, 2023	Animal Diversity	Description of the exoskeleton microstructure of *Phanaeus vindex*	Jackson Wheat*, Louisiana State University Shreveport	19:00
Oct. 21, 2023	Health	Geospatial analysis and assessment of soil lead contamination in Lafayette, LA	Holly Heafner*, University of Louisiana Lafayette	19:30
Oct. 21, 2023	Health	Water, sanitation and hygiene practices in basic schools within the Mfantseman Municipality, Ghana	Kingsford Kobina Annan, University of Cape Coast	20:00
End of Day 3				20:30

Special Addresses

President, Interdisciplinary Environmental Association

Greg Cronin Ph.D.

Greg Cronin is the Vice President of the Interdisciplinary Environmental Association and President of Yon Sel Lanmou, which means "One Love" in Haitian Kreyol. Greg developed the transdisciplinary scholarly approach that he uses to address environmental and human problems in Haiti. Trained as an ecologist and recognizing the need to work in solidarity with experts from multiple fields, he expanded the STEM disciplines to include the Arts, Humanities, and Recreation, forming the acronym HAMSTER. His work in Haiti revealed the devastation of colonialism, genocide, and slavery on the environment. Greg now focuses on Indigenization and decolonization efforts to address environmental problems and improve the livelihoods of those most seriously harmed by colonization.

Honorary Keynote Speaker

Elizabeth Rush, Nonfiction Writer and Pulitzer Prize Finalist

Elizabeth Rush is the author of The Quickening: On Motherhood and Antarctica in the Twenty First Century and Rising: Dispatches from the New American Shore, a finalist for the Pulitzer Prize. Central to Rush's writing practice is the act of listening: listening to those who live in front-line climate changed communities, listening to Antarctica's great glaciers as they go to pieces, listening to all those voices long locked out of environmental conversations. Her work explores a couple of fundamental questions: what does our disassembling world ask of us? How can we continue to live and love while also losing much?

Rush spent many years reporting from coastal communities already feeling the pressure of higher tides and stronger storms. In Rising, she weaves together her personal experience with first hand testimonials of those living on climate change's front lines, guiding readers through some of the places where sea level rise is a reality. Hailed as "deeply felt" (New York Times), "a revelation" (Pacific Standard), and "the book on climate change and sea levels that was missing" (Chicago Tribune), Rising is both a highly original work of lyric reportage and a haunting meditation on how to let go of the places we love.

In 2019, Rush joined fifty-seven scientists and crew onboard a research icebreaker for months. The destination: Thwaites Glacier. The goal: to learn as much as possible about this mysterious place, never before visited by humans, and believed to be both rapidly deteriorating and capable of making a catastrophic impact on global sea-level rise this century. In The Quickening, Rush documents their voyage, offering the sublime—seeing an iceberg for the first time; the staggering waves of the Drake Passage, the torqued, unfamiliar contours of Thwaites—alongside the workaday moments of this groundbreaking expedition. A ping-pong tournament at sea. Long

hours in the lab. All the effort that goes into caring for and protecting human life in a place that is inhospitable to it. Along the way, she takes readers on a personal journey around a more intimate question: What does it mean to bring a child into the world at this time of radical change?

Rush's work has appeared in a wide range of publications from the New York Times to Orion and Guernica. She is the recipient of fellowships from the National Science Foundation, National Geographic, the Alfred P. Sloan Foundation, the Howard Foundation, the Andrew Mellon Foundation and the Metcalf Institute. Today she lives in Providence, Rhode Island with her husband and son. She teaches creative nonfiction at Brown University.

Keynote Speakers

Pierre Goovaerts, Ph.D., Chief Scientist at BioMedware
Dr. Pierre Goovaerts studied at the Catholic University of Louvain-la-Neuve (Belgium) where he earned a PhD in Agricultural engineering in 1992. He then received a Fulbright Research Scholarship and was a postdoctoral fellow at Stanford University (1993-1994), where he wrote the textbook entitled *Geostatistics for Natural Resources Evaluation* published by Oxford University Press in 1997. After five years on the Faculty at the University of Michigan, he became in 2002 Chief Scientist for the R&D Company, Biomedware, Inc, where he conducts NIH funded research on the development of geostatistical methodology for the analysis of health and environmental data. Dr. Goovaerts has authored more than 200 refereed papers in the field of theoretical and applied geostatistics, and he taught numerous short courses on all continents. In addition Dr. Goovaerts acts as a consultant, bringing his expertise to numerous projects dealing with the characterization of air, soil and water pollution and its impact on human health. He was an expert witness for the Deepwater Horizon oil spill and Flint drinking water crisis.

Presentation: Geospatial Estimation of the Impact of Deepwater Horizon Oil Spill on Plant Oiling Along the Louisiana Shorelines: Studies of vegetation death and accelerated marsh erosion following *Deepwater Horizon* (DWH) have shown that both of these impacts (or "injuries," when assessing natural resource damages) can be related to the percent of oiling on the stems of marsh vegetation. Spatial quantification of these injuries thus relies on estimates of how many kilometers of shoreline fell into each of the four stem oiling categories on which these injury determinations were based (0-10%, 10-50%, 50-90%, 90-100%). Vegetation oiling from the DWH spill was unevenly distributed across Louisiana marsh environments, however, and quantitative measurements of stem oiling were collected only at discrete points. Spatially continuous observations of shoreline oiling were collected as part of response activities and the natural resource damage assessment (NRDA), and these data were combined into a "shoreline exposure" database for the NRDA. However, the oiling categories within the shoreline exposure database are qualitative, and do not contain direct information on stem oiling. Furthermore, due to the scope of the DWH spill and the difficulty of finding oil in marshes, these qualitative

shoreline surveys sometimes documented segments as "no oil observed" (NOO) in places where more detailed surveys documented oiling at other points in time. Recognizing the relative strengths and limitations of both of these oiling datasets, the goal of this study was to test and apply geospatial methods for combining quantitative point observations of stem oiling with continuous, qualitative observations in the shoreline exposure database to estimate the length of shoreline falling into each of the five stem oiling categories.

Margaret Miller Ph.D., Research Director at SECORE International

Dr. Margaret Miller is the Research Director for SECORE International, a conservation nonprofit dedicated to creating and sharing the tools and technologies to sustainably restore coral reefs worldwide. She leads SECORE's research strategy and fosters research collaborations with scientific partners. She previously served 19 years as a Research Ecologist with NOAA Fisheries' Southeast Science Center. She led an active field research program in the Florida Keys focused on coral early life history, coral restoration, population studies of threatened elkhorn and staghorn corals and their threats as well as playing instrumental roles in shaping NOAAs coral reef monitoring program and the listing and recovery planning process for corals under the Endangered Species Act and continues to serve on the US Acropora Recovery Implementation Team (ARIT). Margaret grew up and learned to SCUBA dive in southern Indiana. She has an undergraduate degree from Indiana University and a doctorate in marine ecology from UNC-Chapel Hill. She is currently in the process of moving her residence of 29 years in Miami to North Carolina to escape increasing climate stresses in South Florida.

Presentation: Coral 'midwifery' and empowering coastal communities to improve coral restoration effectiveness in a changing world: The breathtaking rate and scope of global coral reef decline has fostered a rapid increase in investment in coral restoration. Although fragmentation (cloning) is the dominant mode of coral propagation for restoration, coral breeding and larval propagation hold promise for both scaling and for fostering restored populations with greater adaptive potential in changing environments. Nonetheless, there are additional steps and 'barriers to entry' for this approach. SECORE International's focus is R&D for tools and practices that enable local organizations to successfully engage in coral breeding without requiring costly land-based infrastructure (e.g. laboratories or aquaculture facilities), and sharing these via a proven training model. To accomplish this R&D, ecological research on topics such as coral reproduction and early life history, genetic bottlenecks, and ecological interactions are then applied in the engineering design and development process. Meanwhile, the network of local implementing partners in our training program, including 14 organizations across ten Caribbean jurisdictions, provides rapid feedback on usability and effectiveness of these developing tools. The goal is to grow the efficiency and effectiveness of coral restoration capacity to approach the scale of reef degradation. Meanwhile, these efforts will ultimately fail in maintaining coral reef ecosystem services without implementing serious and effective solutions

to climate change and local threats that are required to maintain viable coral habitat conditions in coastal environments.

Clinton Willson, Ph.D., Interim Dean, Professor of Civil & Environmental Engineering

Dr. Clint Willson, Ph.D., P.E. is the Interim Dean of the LSU College of the Coast & Environment and the Mike N. Dooley, P.E. Professor of Civil & Environmental Engineering, has been at LSU for over 25 years teaching and conducting research in the broad areas of water resources and environmental engineering. Clint also serves as Director of the LSU Center for River Studies, a collaboration with the Louisiana Coastal Protection and Restoration Authority, a research facility located on the Baton Rouge Water Campus. The Center's mission is two-fold: educate visitors about the river, the Louisiana coast, and the flood risk reduction and coastal restoration science and engineering in southern Louisiana; and to use the Lower Mississippi River Physical Model to study the hydraulics and bedload (sand) transport in the lower 190 miles of the river. Over 100 LSU and other students have worked at the Center and its predecessor. Clint received his B.S. in Aerospace Engineering from Penn State University and then served for almost seven years as an officer in the U.S. Marine Corps. After his service, he attended the University of Texas at Austin where he earned a M.S. in Environmental Engineering and Ph.D. in Civil Engineering. Before coming to LSU, he spent two years as a postdoctoral research associate at the University of North Carolina at Chapel Hill.

Presentation: The LSU Center for River Studies, a collaboration with the Louisiana Coastal Protection and Restoration Authority, serves as a space on the Baton Rouge Water Campus to educate students, the public, and policy makers, and to conduct research on the lowermost Mississippi River. This presentation will consist of two parts. First, a virtual tour of the Center for River Studies will be shown that provides an overview of the types of exhibits and outreach activities that are used for education & outreach, as well as an overview of the physical model. The second part will focus on the Lower Mississippi River Physical Model (LMRPM) – how it was designed and constructed, the types of research that is being done, and some of the key takeaways that have come from the experiments.

Conference Abstracts (listed alphabetically by session, and author; *student speakers)

Agriculture and Horticulture Session

Effects of biochar-compost product blends on switchgrass growth rates. Cameron Crowder*, Saint Edward's University, Austin, TX, USA.

Biochar, compost, and compost tea have become increasingly popular methods for promoting plant growth for agriculture and restoration projects in recent decades. Because of their effectiveness and cheap production, they are commonly used for introducing nutrients, maintaining soil quality, sequestering carbon, improving the microbiome, disease resistance, drought tolerance, and preventing heavy metal absorption by plants. This research aims to understand the effects of combining biochar with compost products and distinguish which are best for switchgrass plant growth. Four treatments were used: biochar-compost (BC), biochar compost tea (BT), biochar-compost-compost tea (BCT), and a control (Control). The tallest surviving plants were measured regularly to determine the plants' height and width growth rates. The preliminary results indicated that the steepest rise in growth was in the biochar-compost treatment (BC), followed by the biochar-compost-compost tea (BCT) mixture alongside the control (Control), and then biochar-compost tea (BT). The results have shown that biochar compost (BC) treatments do best for plant growth overall although more information needs to be gathered long-term before reaching a definitive conclusion.

Emergence of bittercress (*Cardamine flexuosa*) and oxalis (*Oxalis corniculata*) through rice hulls applied at four different depths in nursery containers. Heather Kalaman[1], Chris Marble[2], [1]University of Florida, [2]Department of Environmental Horticulture, University of Florida, Gainesville, FL, USA.

Rice hulls have gained popularity as a non-chemical weed management tool in both container nursery production and landscape cultivation and for a variety of reasons. Most notably, due to increased sensitivity of many ornamental plants to over-the-top applications of pre-emergent herbicides, which may have negative environmental impacts when applied prior to periods of heavy rainfall. While rice hulls are typically applied early on, they can also be applied later in the production cycle due to labor issues, available application equipment, or time constraints. Delaying applications for as little as a few days to a few weeks often leads to germination of weed species that can rapidly germinate and thrive. Although rice hulls have been evaluated extensively as a weed management tool, it is still unclear how efficient they are at controlling or suppressing weeds after they have already emerged. The objective of this trial was to determine

the emergence of two common weeds, bittercress (*Cardamine flexuosa*) and oxalis (*Oxalis stricta*) following rice hull application at various stages of weed development. To determine emergence, containers were filled with a standard substrate and amendments, placed in a shade house, and irrigated daily (0.8 cm) via overhead irrigation. Pots were seeded with approximately 20 seeds of either weed species, two weeks apart. After two weeks, pots were thinned so that each contained either 5 bittercress seedlings or 5 oxalis seedlings. This yielded oxalis and bittercress pots that contained plants that were either at the cotyledon to 1 leaf growth stage or the two to four true leaf growth stage. At this time, rice hulls were applied to the containers at depths of 0, 0.25-inch, 0.5 inch, or 1 inch. Counts of weeds that emerged through the rice hulls were recorded at 4 and 10 weeks after rice hulls were applied. Results showed that weed emergence generally decreased linearly for both weed species at both stages of growth with no emergence (weed counts of 0) being observed in pots mulched at a 1-inch depth. While the 0.5-inch depth significantly decreased emergence, bittercress and oxalis showed the ability to emerge and eventually flower and produce seed at both growth stages, potentially leading to further weed issues in cultivation scenarios. Overall, this data suggests that rice hulls would be an effective weed management method on seedling bittercress and oxalis, but depths of at least 1 inch are needed for adequate control.

Building a program for horticulture professionals on climate–smart landscaping practices in Florida. H. Cohen[1], Y. Goodiel[2], R. Klein[3], Kara Krueger[4], H. Mayer[5], M. Orfanedes[6], and D. Rainey[7], [1]Entomology Advisor, University of California, Ventura, CA, USA, [2]Martin County Extension Service, University of Florida IFAS, Stuart, FL, USA, [3]Environmental Horticulture Department, University of Florida IFAS, Gainesville, FL, USA, [4]Palm Beach County Extension Service, University of Florida IFAS, West Palm Beach, FL, USA, [5]Miami-Dade County Extension Service, University of Florida IFAS, Homestead, FL, USA, [6]Broward County Extension Service, University of Florida IFAS, Davie, FL, USA, [7]Regional Specialized Agent – Water Resources, Plant City, FL, USA.

Research on global climate change predicts that coastal communities, such as Florida, will experience permanent environmental changes. These changes include shifts in temperatures and precipitation rates, which can increase pest and disease pressure and extreme weather events. Research on global climate change predicts that coastal communities, such as Florida, will experience permanent environmental changes. Florida is the sixth-highest state in the United States for greenhouse gas emissions. Unfortunately, we do not have enough resources to help the horticulture industry navigate climate change. To address this issue, we conducted a needs assessment in the summer of 2022 to understand horticulture professionals' perceptions of climate change. Out of the 279 respondents, 65% believe that the horticulture industry should do "more" or "much more" to address climate change, 70% are interested in learning more about climate change, and 67% say they should be preparing landscapes for climate change.

Additionally, 64% of respondents indicated their business would benefit from marketing as climate-smart. However, the need for knowledge and the cost of climate-friendly tools, equipment, and practices were identified as obstacles to implementation. The program objectives aim to increase awareness of climate change and promote the development of climate-smart business plans by educating participants and encouraging them to adopt sustainable practices. We plan to provide state-wide horticulture professionals programming through extension focusing on climate change, mitigation, and resiliency practices, and develop a climate-smart business certification program. Additionally, a website will be developed to serve as the central platform for the project, providing online resources and training modules in English and Spanish. The main objective of this program is to equip professionals with the education and tools necessary to sustain their livelihoods in the face of climate change.

Animal Diversity Session

Description of the exoskeleton microstructure of *Phanaeus vindex.* Jackson Wheat*, Beverly Burden, Stuart Nielsen, Matyas Buzgo, Louisiana State University Shreveport, Shreveport, LA, USA.

Phanaeini is a New World tribe of scarab beetles whose members are noteworthy for their iridescence—the phenomenon that a color changes as the angle at which it is viewed changes. Iridescence has evolved independently in various clades of animals, including multiple clades of arthropods. Recently, a team of researchers have described the microstructure of the elytra of the iridescent beetle *Chrysina gloriosa*. The North American *Phanaeus vindex* also displays iridescence; however, the microstructure of *P. vindex's* elytra has not yet been elucidated. The null hypothesis is therefore that the elytra of *P. vindex* is the same microstructurally as that of *C. gloriosa*. Following analysis, we have accepted the null hypothesis: *P. vindex* displays elytral hexagonal cells that, when viewed from above, are microstructurally similar to those of *C. gloriosa*. By having such hexagonal cells, this indicates that the underlying chitin microfibrils are behaving like a cholesteric liquid crystal, meaning in part that each chitin layer is directionally rotated relative to the layers above and below it. Since *P. vindex* and *C. gloriosa* do not form a monophyletic clade of iridescent beetles, that means this morphology has evolved convergently in at least two separate clades of scarab beetles.

Climate Change & the Coast Session

Migration with dignity: Climate refugees among small island nations. Kay Athanasidy*, Rivka Eckert, SUNY Potsdam, Potsdam, NY, USA.

Climate change is affecting the everyday lives of us all, especially those in small island nations. Small island nations are more vulnerable to climate chaos for both socioeconomic reasons and the fact that they are generally more exposed to environmental hazards. This presentation focuses primarily on island nations in the Pacific region and the effects they are feeling from sea level rise. Some of these countries stand only meters above sea level – Tuvalu specifically only being about 2 meters above sea level, making the community especially vulnerable. The first section discusses how several Pacific island nations are facing the reality of migration due to climate change. Section one also covers some of the general threats sea level rise has already placed on their communities. The second section describes how there are three categories of climate refugees, along with a brief history of how the term "climate refugee" began. There is discussion on what countries have planned for climate refugees, if they have a plan at all, considering the United Nations does not formally recognize climate refugees as a group – meaning they lack certain support systems. The final piece of the presentation is a discussion on the concept of "Migration With Dignity" created by the president of Kiribati, one of the nations currently facing forced climate migration.

Influence of Climate Change on the Physical Parameters of Biscayne Bay, Florida, USA.
Caccia, Valentina [1], Janz, Elizabeth[2]*, Estevanez, Maria[2], and Olascoaga, Josefina[2], [1]Miami-Dade County Department of Regulatory and Economic Resources, Division of Environmental Resources Management (DERM), Miami, FL, USA, [2] Rosenstiel School of Marine and Atmospheric Science, University of Miami, Miami, FL, USA.

Climate change is affecting all ecosystems on the planet, and estuaries are no exception. Biscayne Bay is the largest estuary on the Atlantic coast of southern Florida and is located in Miami-Dade County. It has an area of approximately 700 km 2 and an average depth of 1.8 m. Sea level rise is one of the most evident impacts on the bay, due to its low elevation and limestone geological composition. Additionally, it has been facing water quality problems for several decades due to accelerated coastal development, channeling, and poor management of fresh water. In this study we evaluate the influence of climate change on the physical parameters of the Bay. The objectives were to determine if there were temporal, seasonal and spatial changes in the distribution of salinity, dissolved oxygen, and temperature in the last two decades. Twenty years (2001-2021) of monthly data on physical parameters, measured at the surface at 34 stations of the Biscayne Bay Water Quality Monitoring Program, were analyzed. The Bay was divided into 8 zones with similar water quality characteristics then analyzed by decades, season of the year, and zone. The distribution of salinity showed no change over time since it is influenced by the fresh water input from the canals and rivers. However, decade 2 showed higher salinities. The 3 zones located at the mouths of the canals (NBCM, CBCM, SBCM) and the northern area of the bay (NB) exhibited a noticeable seasonal pattern with lower salinities during the rainy season and higher salinities in the dry season in both decades. The two zones with the greatest

influence from the Atlantic Ocean (MB, IS) did not show any seasonal or decadal changes. Our results showed that surface water temperatures have increased in this accelerated phase of global warming. All zones showed higher temperatures in decade 2 (+0.5 °C) with the greatest increase in the northern area (+0.8 °C). Temperature and dissolved oxygen showed a very clear seasonal pattern in all areas. In both decades, the lowest concentration of dissolved oxygen was found in the three canal mouth zones (NBCM < CBCM < SBCM) due to the upstream contribution of groundwater, and the highest concentration was observed in the AS and IS due to seagrasses. The three parameters studied showed an increase in decade 2, suggesting that sea level rise and climate change are affecting the Bay and transforming it into a more marine environment.

Climate and ocean change education: Methods, case study and resources. David Crookall[1,2], Pimnutcha Promduangsri[2,1], [1]Inter- Ocean-Climate School (IOCS), Cagnes, France, [2]Université Côte d'Azur (UCA), Nice, France.

Anthropogenic climate change and ocean change (degradation) present existential threats to humanity and life on Earth. Examples include drought, heat domes, ocean acidification, biodiversity loss, sea-level rise, coastal erosion, extreme weather events, marine ecosystem destruction, fossil fuel wars and extinction. Climate and ocean change education (COCE) can play a crucial role in addressing these challenges. COCE can help people to understand the complexities and thus to take responsible action. COCE may thus empower organizations and individuals to contribute to the survival of nature and humanity. We will discuss four themes: We will first (1) present a general overview of climate change and ocean education. The following section (2) will outline several initiatives and methods in COCE, such as integrating climate change and ocean topics into school or university curricula, outings, participatory methods, online games and film. Then we will present a case study (3) of an interdisciplinary, online summer school, called the Inter- Ocean-Climate School (IOCS). The school objective is to help a diverse range of stakeholders to become ocean-climate literate through an understanding of the interplay among the ocean, climate systems and coastal dynamics. Several learning methodologies are used, including participatory simulation, debriefing and online interaction. We will end (4) by providing resources for COCE. They include associations, conferences, publications and other educational materials. We encourage participants to ask questions and share their opinions.

Coastal cities and climate change: Lessons from moral ordering on competing interests in urban environments. Shane Epting, Missouri University of Science and Technology, Rolla, MO, USA.

Many coastal cities are rich cultural centers that remain imperiled, facing several threats from extreme weather events. Major global cities are now investing in resilient infrastructure and policies designed to mitigate the harms associated with climate change. Such measures are morally defensible because they aim to protect life and property. In turn, implementing these infrastructures deserves praise and support. Along with these efforts, we can bolster them if we ensure that all affected stakeholder groups receive adequate attention. To address this challenge, this presentation exhibits how employing the emerging concept of "moral ordering" can safeguard marginalized groups and vulnerable populations when dealing with these affairs.

Resilience buildings in the era of climate change in the USA. Mehdi Ghiai, University of Louisiana at Lafayette, Lafayette, LA, USA.

In the face of escalating climate change challenges, the United States finds itself at a critical juncture, requiring innovative strategies to ensure the resilience of its built environment. This paper explores the concept of "Resilience Buildings" as an essential approach to addressing the multifaceted impacts of climate change on the built environment in the USA. With a focus on sustainable design principles, technological advancements, and community engagement, this paper sheds light on the indispensable role of architects and urban planners in enhancing the nation's ability to adapt and thrive in an era of climate uncertainty. The research commences by offering an overview of the prevailing climate change scenario in the USA, highlighting the increasing frequency and severity of climate-related disasters. It underscores the urgency of adopting a proactive approach to minimize vulnerabilities and maximize adaptability. Subsequently, the paper delves into the concept of "Resilience Buildings," which encompasses constructing physically robust buildings and integrating sustainable, energy-efficient technologies and eco-friendly materials. Furthermore, it examines the importance of designing spaces that foster social cohesion and community resilience, emphasizing the role of architects as catalysts for change and innovation. In conclusion, this paper contends that resilience buildings are not merely a response to climate change but a proactive and holistic approach that reimagines the built environment as an adaptable, sustainable, and inclusive space. By fostering innovation, embracing technology, and prioritizing community engagement, architects and urban planners can play a pivotal role in shaping a resilient future for the USA in the era of climate change.

Zooming in on Gulf Coast flood risk and exposure: Measuring the relationship between neighborhood-level flood risk and unique place-based factors. Anissa Hyde*, Thomas Douthat, Mariam Valladares Castellanos, Louisiana State University, Baton Rouge, LA, USA.

The Gulf Coast has a long history of severe flooding that urges agencies to plan and assess the

vulnerability of communities across the coast. Typically, risk assessments are measured at a county level and may miss critical neighborhood-level variations. Our study is interested in a granular flood risk and exposure assessment. To achieve this, we created a longitudinal census tract level dataset that describes the frequency and magnitude of flood exposure and socio-economic data in the Gulf Coast region over the past 20 years. With this dataset, we can analyze the relationship between current risk ratings and community characteristics such as income and housing unit age. This study uses multiple statistical tests to describe common characteristics in areas that experience frequent flooding. We hypothesize that current risk indicators do not fully consider unique place-based factors that influence a community's vulnerability to flooding. With our study, we intend to contribute a uniquely comprehensive method to understand coastal flood risk. This information is valuable to urban planning agencies interested in flood mitigation and recovery aid policy.

Climate change education for children in East Baton Rouge Parish, Louisiana. Christine Karagu*, Yaw A. Twumasi, Zhu H. Ning, Southern University and A&M College, Baton Rouge, LA, USA.

Climate change is a critical global issue, and it is imperative to educate children about its intricate nature and potential remedies so as to cultivate a sustainable future. Nevertheless, it is evident that in East Baton Rouge, Louisiana, the school curriculums fail to effectively address the complex aspects of the climate change, specifically with regard to waste and environmental management. The gap in climate change education in East Baton Rouge is that there is omission of crucial topics in the school curriculum, leaving children unprepared to address the environmental problems impacting their neighborhoods. The objective of this study is to address the existing disparity by creating an innovative and exhaustive climate change education initiative that is designed to meet the unique requirements of children in East Baton Rouge. This will create new educational resources that explore topics such as waste management, pollution, and local climate-related issues. Techniques, such as interactive magazines, field exposure opportunities, and virtual lessons, will be used to successfully engage young learners. The intended outcome of this study is to foster an understanding of climate change issues, environmental challenges, and viable sustainable remedies in East Baton Rouge. It aims to enhance environmental literacy and promote activism among the younger generation, with the goal of developing a community that is more resilient and environmentally responsible.

Fostering Stewardship in Coastal Communities Through Watershed Education and Civic Engagement. Lara Milligan[1], Michelle Atkinson[2], Michael D'Imperio[3], and Shannon Carnevale[4], [1]UF/IFAS Extension Pinellas County, Tarpon Springs, FL, USA, [2] UF/IFAS

Extension Manatee County, Palmetto FL, USA, [3] UF/IFAS Extension Sarasota County, Sarasota, FL, USA, [4] UF/IFAS Extension Polk County, Bartow, FL, USA.

The Florida Waters Stewardship Program (FWSP) was launched in 2016, taking inspiration from successful "Master" water programs across the United States. Its primary mission is to reshape participants' perceptions of water, motivating them to take proactive steps to protect and support local water resources. Despite the challenges posed by the COVID 19 pandemic, FWSP displayed remarkable adaptability by transitioning to an online format in 2020, followed by a hybrid model in 2021. Currently, the program is operational in four counties in west-central Florida, demonstrating significant potential for localized impacts. FWSP employs a comprehensive approach to inform, inspire, and connect participants. It enhances knowledge through professional presentations featuring research-based information. By focusing on the human dimensions and interpersonal aspects of stewardship, FWSP empowers participants to use their enhanced knowledge to affect change in their community. The program fosters a sense of place by conducting class sessions at various locations, each with a water-focused mini-tour to establish a stronger connection with local water resources. FWSP also promotes a sense of connection by exploring relevant water information, engaging with local stakeholders, and investigating local case studies. Mini-tours often expose participants to new locations, or provide a new perspective on familiar places, working to deepen the connection between participants and their community. Additionally, the program cultivates a sense of possibility by sharing success stories and equipping participants with tools to address contentious water issues. Expanding networks is a key component, as FWSP builds a sense of community within each class cohort and introduces participants to local guest speakers, fostering connections with water stewardship experts. Participants are introduced to local agencies and learn to identify avenues of fostering real change in their community. Crucially, FWSP emphasizes action. Participants are encouraged and supported in implementing group or individual water stewardship projects, translating their knowledge and enthusiasm into tangible initiatives that benefit local water resources. Since its inception, FWSP has offered 14, multi-session, 24-contact-hour courses, reaching 239 participants with critically important state and local water resources information. These FWSP course offerings have also resulted in the implementation of over 40 local stewardship projects to improve or educate about local water resources. FWSP highlights the power of education and community engagement in driving positive change.

Assessing the potential impact of flood-induced-climate change on Louisiana's coastal communities, ecosystems, and infrastructure through the lenses of GIS and remote sensing.
Jeff Dacosta Osei[1], Dorcas Twumwaa Gyan[2], Esi Dadzie[3], [1]University of Energy and Natural Resources, Sunyani, Ghana, [2]University of Cape Coast, Cape Coast, Ghana, [3]Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

Coastal regions worldwide are increasingly vulnerable to the impacts of climate change, with rising sea levels and increased frequency of extreme weather events posing significant threats to communities, ecosystems, and infrastructure. This study presents an integrated geospatial analysis framework for assessing flood hazards and mapping associated risks in the context of climate change. A case study is conducted in the coastal communities of Louisiana, a region susceptible to the dual challenges of land subsidence and sea-level rise. The methodology combines various remote sensing data sources, including Landsat 8 imagery, Shuttle Radar Topography Mission (SRTM) elevation data, and Global Surface Water (GSW) occurrence data. Each data source is meticulously processed and analyzed, with specific attention to data pre-processing, spatial analysis, and the application of hazard-scoring techniques. The analysis encompasses multiple key factors influencing flood hazard, including proximity to water bodies, elevation, Topographic Position Index (TPI), Normalized Difference Vegetation Index (NDVI), and Normalized Difference Water Index (NDWI). These factors are evaluated, scored, and integrated into a comprehensive flood hazard assessment, providing a nuanced understanding of the spatial distribution of flood risk within the coastal communities of Louisiana. The results reveal critical insights into the complex interplay of geospatial variables contributing to flood hazard, highlighting areas at high risk of inundation. The findings have significant implications for disaster preparedness, urban planning, and climate change adaptation strategies in Louisiana's coastal communities, underscoring the importance of proactive measures to mitigate the impacts of future floods. This research not only contributes to the field of flood hazard assessment but also serves as a valuable model for integrated geospatial analysis in climate change impact studies. The approach outlined in this study can be applied to other coastal regions facing similar challenges, providing a robust framework for informed decision-making in the face of a changing climate.

Optimizing lighting performance and visual comfort in Florida: An innovative approach to auxetic shading design. Jingyuan Shen[1,2]*, Ryan Sharston[1,2,3], [1]Florida Institute for Built Environment Resilience, University of Florida, [2]Rinker School of Construction Management, University of Florida, [3]School of Architecture, University of Florida, Gainesville, FL, USA.

Due to high U-Values inherent in the construction, heat exchange predominantly occurs through the building's windows and doors, resulting in increased energy consumption. Consequently, the demand for an efficient shading system that balances adequate illumination with glare management to ensure optimal visual comfort becomes imperative. Prior research has not extensively explored shading systems employing computerized geometric designs, such as auxetic structures, to address the dual challenges of optimizing daylighting and reducing glare while mitigating excessive heat transfer. Recognizing the pivotal role of shading systems in contributing to the mitigation of the effects of climate change and occupants' health and well being, this study delves into the lighting performance and visual comfort offered by a unique

design. This innovative system seeks to maximize spatial daylight autonomy and minimize daylight glare probability (DGP) through a blend of simulation techniques (leveraging Grasshopper-based optimization) and practical experimentation involving a 6' x 6' x 7' mock-up. Over a six-day period commencing on August 9th, measurements were taken at multiple intervals daily to correspond with the sun's varying altitudes (12 PM, 8 AM, and 4 PM) in Gainesville, Florida. The results revealed that, on average, the shading system led to a reduction of over 50% in average illuminance levels across all scenarios, with the most substantial reduction of 80.7% occurring at 4 PM. Furthermore, measurements indicated that the shading system decreased the average DGP for the East, South, and West façades by 38.5%, 33.9%, and 27.8%, respectively, significantly enhancing occupants' comfort. In summary, this paper introduces an innovative shading system designed to enhance occupants' visual comfort and, consequently, improve indoor environmental quality. Moreover, it demonstrates an advanced optimization approach, combining simulation techniques with real-world performance assessments, representing a notable advancement in shading system design and implementation.

Testing of primers to detect oil spill microbe *Alcanivorax borkumensis* using PCR. Illya Tietzel, Gawain Kiffin, Keith Perkins, Southern University at New Orleans, New Orleans, LA, USA.

Natural seepage of oil and man-made oil spills allow microbes to grow that can break down oil. One of the microbes that can break down the alkane components of crude oil is *Alcanivorax borkumensis*. Detection of oil spill microbes such as *A. borkumensis* via polymerase chain reaction (PCR) would provide answers to import questions. The existence of the natural or anthropogenic releases of oil that are sufficient to allow oil spill microbes to grow could be detected. The existence of oil spill microbes in the gut microbiome of vertebrates and invertebrates as an indication of dysbiosis or novel microbiome developments could be studied. In order to study these questions a lab strain of *A. borkumensis* was grown in vitro. Primers specific for the alkB1 and alkB2 gene were developed in silico and tested with polymerase chain reaction (PCR). The predicted amplicon size for alkB1 was 100 bp and for alkB2 was 134 bp. Agarose gel electrophoresis showed DNA bands at around 100 bp for alkB1 and 134 bp for alkB2. DNA isolated from the intestine of the Gulf Menhaden fish caught during the 2010 oil spill showed DNA amplicon for alkB2. PCR from the intestine of shrimp caught in 2013 may have been positive for alkB1. Taken together, primers to detect presence of oil spill microbes such as *Alcanivorax borkumensis* can be used with PCR. The research was funded by NSF RAPID award to I.T.

Epistemological formation in the interdisciplinary collaboration: Cross-country studies on seagrass restoration projects. Keiko Yokoyama, Hiroshima University, Hiroshima, Japan.

Michael Gibbons et al. proposed the shift of knowledge from Mode 1 (disciplinary) to Mode 2 (inter and/or trans-disciplinary) in 1994. The recent increase of interdisciplinary research and community-driven projects which relate to climate change mitigation support Gibbons' argument. The question is how knowledge is integrated among different stakeholders with different disciplines and different values. Are there any patterns of knowledge sharing and creation in the forms of disciplinary integration and public-private partnership? The research investigates how knowledge is produced in interdisciplinary, collaborative mitigation of climate change. It will clarify how different values shape knowledge, giving attention to types of involved disciplines and the forms of partnership. The purpose of the research project is to clarify disciplinary, epistemological interaction and partnership among different university Departments and with non-academic sectors. The former deals with epistemological issue, while the latter involves in network and decision-making. This study requires the large data. Hence, the pilot study is conducted, the result of which is this paper. This paper answers the part of the above big question, confining to the context of seagrass restoration, a Nature-based solutions (NbS). It takes a case study. The study collects data from questionnaires and the semi-structured interviews in Australia, Germany, Japan, the UK and the US.

Corporate Environmentalism Session

Does local social capital encourage profit organizations to go green? Hayeon Jo*, Daewoung Choi, Louisiana State University Shreveport.

We examined whether profit organizations in high local social capital norms improve   their environmental-related activities. Using extensive panel data of S&P 1,500 sample firms from 2002 to 2013, we find that companies significantly respond to the regional social capital by increasing their environmental performance. Our study suggests practical implications that societal events affecting the local social capital achieve a high standard of environmental sustainability in the corporate world.

Energy Session

The green energy transition: Implications for Africa's environment and development. Joseph Cudjoe, Florida Gulf Coast University, Ft. Myers, FL, USA.

As the world makes a transition to clean-energy technologies, there is a greater demand for critical minerals that are needed for phones, electric vehicles, satellites, and much more.

According to forecasts, the global demand for minerals such as cobalt, copper, lithium, manganese is expected to grow exponentially in the coming decades (Burrier and Sheehy 2023). It is important to note that while other parts of the world may abound in critical minerals, Africa remains a major supplier of critical minerals, accounting for over 30% of global minerals. While some studies have attempted to look at the beneficial impacts of green technologies from the demand side, there is a dearth of studies on the supply side, the locales where minerals are extracted for these green technologies. This study attempts to fill the void in the literature. The key question is what does this heightened drive toward the extraction of these minerals imply for Africa's environment (physical and socio-economic) and overall development? Beyond the macro-level, governmental and interagency discourse, what are the benefits of mineral extraction to the local population? Are there social justice, human rights, and other implications related to gender issues? These interrelated questions are all the more important considering what appears to be a new scramble for Africa. The strategic importance of these minerals can be seen in terms of China's role and that of the United States regarding the extraction of these minerals. The methodology of this study is at two levels: (a) A content analysis of the extant literature outlining the common threads that are present in the experience of some select African countries in the extractive industry (b) A microlevel analysis involving a survey of mining communities in gold and oil extracting fields of Ghana, West Africa. The latter part examines the role of China and Chinese nationals and the general perception and experience of local communities toward mineral activities in their area. The preliminary findings suggest that there are major challenges related to the extraction of the minerals, such as transparency, mistreatment of local indigenous populations, and sharpening inequalities of class and gender, and the general environmental destruction of land.

Potentials of converting organic waste to energy in Kumasi Metropolitan Assembly, Ghana.
Esi Dadzie[1], Appiah, D.O.[2], Jeffery Osei Dacosta[3], Dorcas Twumwaa Gyan[4]. [1,2]Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, [3]University of Energy and Natural Resources, Ghana, [4]University of Cape Coast, Ghana.

Rapid urbanization, industrial expansion and changing societal demands and consumption patterns have resulted in huge daily volumes of waste generated as well as increased energy consumption in cities of most developing countries. Many countries have resorted to the use of alternative sources of fuel including energy from waste to cater for their energy requirements, thus, promoting smart and sustainable cities. Yet, most countries of the developing world are battling with the issues of waste management coupled with an efficient supply of energy. This study identified the potential of converting waste into energy using the bio-digester. A mixed-method approach was used for the study. One (1) key informant was interviewed from the Waste Management Department in the Kumasi Metropolitan Assembly, three (3) from biogas digester operators and One (1) biogas specialist. The study revealed that a daily average of

713,400kg liquid waste disposed at the KMA landfill site had the potential to generate 285,360m3 biogas, enough to fill 30,000 19kg gas cylinders to be used for cooking, lighting, transportation and other uses. Also, the waste-to-energy approach could save the metropolis about GHC 70,000 which is used to manage liquid waste within the metropolis each month. Waste recovery has great potential to serve households' energy needs. The study recommends that the government in conjunction with stakeholders of electricity and gas should make waste recovery a national priority. Various educational institutions, particularly, Senior High and Tertiary institutions could be used as a baseline to begin the conversion and consumption of energy from waste as this would inculcate, promote and serve as a means of diffusing the concept of sustainability in society and beyond.

A public response-centered framework for the study of energy injustice in the emerging renewable energy sector. Idowu Kunlere*, Kalim Shah, University of Delaware, Newark, DE, USA.

As the global energy transition intensifies, various studies have raised concerns that energy injustice, traditionally associated with the fossil fuel industry, could spill over into the emerging renewable energy sector and derail the energy transition goals. Thus, researchers are increasingly interested in understanding the threats of energy injustice to renewable energy development. However, despite this interest, serious gaps exist in conceptualizing, framing, and analyzing energy injustice. For example, there are limited analytical frameworks for robustly dissecting how the public responds to energy injustice. This problem is similar to related issues like climate change, where public responses are often broadly divided into "proponents" and "deniers". Unfortunately, this strict two-way classification ignores potential variations in public responses to energy injustice and harpers a holistic analysis of the problem or the required solutions. Therefore, to address this critical gap, this paper proposes the PARO framework as a conceptual framework for broadly analyzing public responses to energy injustice in the emerging renewable energy sector. Lastly, the PARO framework, which may be applied to other areas like climate change, provides additional lenses for better interrogating and understanding public response to energy injustice.

Health Session

Water, sanitation and hygiene practices in basic schools within the Mfantseman. Kingsford Kobina Annan, Simon Mariwah, University of Cape Coast, Cape Coast, Ghana, Municipality, Ghana.

This study sought to examine sanitation and hygiene practices among pupils of basic schools within the Mfantseman Municipality of Ghana. Underpinned by the pragmatic philosophy and employing the convergent parallel mixed method approach, the study collected data from 368 students, 16 head teachers and four key informants. The findings revealed that pupils have satisfactory sanitary and hygiene practices, in spite of inadequate WASH facilities in schools. Also, it was found that the Covid-19 pandemic improved handwashing practices in schools through the introduction of handwashing facilities. It is recommended that the Ghana Education Service, in collaboration with the Mfantseman Municipal Assembly, should ensure adequate provision of WASH infrastructure and interventions in schools to promote sanitary and hygiene practices.

Mitigation of anthropogenic effects on zoonoses: Global and local considerations. Lori Zeringue Crow*, Matthew Kelley, Denise Bates-Fredi, Louisiana State University Shreveport, Shreveport, LA, USA.

Zoonoses are infections passed from animals to humans. These infections pose an increasing global threat in part due to various anthropogenic factors bringing humans in closer contact with animals. Two major drivers of zoonoses are land use change and wildlife trade. Increased human exposure to animals arising from land modification and participation in wildlife trade have been linked to severe human infectious disease outbreaks. Global pandemic preparedness must include plans to reduce the escalating rate of zoonoses from human activities. This literature review presents the recent efforts to operationalize the One Health concepts to mitigate zoonoses linked to land use and wildlife trade. Recent attempts at regulating wildlife markets demonstrate that regulation has challenges and outright bans of wildlife use should be avoided. Complete bans of wildlife markets cause undue harm to local communities that rely on wildlife trade for sustenance. Instead, policy change regarding the regulation of wildlife markets should prohibit the use of high-risk animals only. Additionally, this project investigates trials to quantify land use and mathematically correlate it to zoonotic spillover. Early data from these mathematical models suggest that the patterns of deforestation, and not just the area, are important considerations for reducing zoonotic risk. Examining such information on wildlife trade and land use change can build a foundation for future policy aimed at reducing zoonoses. To develop these policies sustainably and equitably, One Health practitioners should use the Sustainable Development Goals (SDGs) as a guide when developing a strategy to address increasing zoonoses. When One Health practitioners develop wildlife use and land use policies using sound evidence that reflects the SDGs, both reduction in pandemic risk and the consideration of equity are addressed.

People are burning out faster than the fires: USA wildland firefighters resilience, health, and collaboration in worsening fire seasons. Adelmut Duffing Romero*, Universitat Autonoma Barcelona, Barcelona, Spain.

Recent research on U.S. wildland firefighters' resilience has thus far failed to examine integrated resilience threats and contributors, including integrative health and collaborations with civic and community groups in affected communities. By conducting semi-structured interviews with stakeholders, this study addresses the major stressors and protective factors experienced by a diverse set of firefighters. Respondents were questioned about resilience, health, and community relationships. Results showed that community ties, a sense of camaraderie, freedom, and adventure in the face of adversity boost resilience. A lack of collaboration from different stakeholders; a stoic culture of fire suppression; no accessible culturally-specific care; and hiring/retention practices threaten the occupation's ability to face worsening fire seasons.

Geospatial analysis and assessment of soil lead contamination in Lafayette, LA. Holly L. Heafner*, Anna A. Paltseva, University of Louisiana Lafayette, Lafayette, LA, USA.

Potentially hazardous heavy metals are ubiquitous in urban environments, where children are generally more vulnerable to exposure due to prolonged outdoor time, hand to mouth behavior, and incomplete physical development. Exposure to heavy metal contamination in urban areas may lead to a variety of human health issues, including diminished mental and physical capabilities, illnesses, and cancer. To assess the extent of lead contamination in Lafayette, LA, representative soil samples will be collected from industrial and commercial areas, public recreation sites, private residences, and heavily trafficked areas. Lead concentrations will be measured with the X-ray Fluorescence analyzer (XRF). Geospatial analysis of the samples will be achieved using the Kriging tool in ArcGIS. Children's blood lead levels will be obtained from the Louisiana Department of Health. Community demographic information will be accessed through the U.S. Census Bureau to evaluate the metal's relationship to socioeconomic factors, such as wealth, health, and education. This study will be the first to address the connection between potentially harmful trace element concentrations (Pb), risks to children's health, and the socioeconomic situation in Lafayette, LA. The results of this study will aid decision makers in managing heavy metal contamination in urban soils. This study will be a needed addition to the literature regarding heavy metal surveys, and will serve as a database for the community to utilize for proper management and remedial solutions. The objectives of the present study are 1) to quantify soil Pb concentrations in Lafayette, LA with XRF measurements; 2) to identify the spatial distribution of this metal using GIS analysis tools; 3) to evaluate the relationship of soil heavy metal contamination with socioeconomic factors.

Urban Environmental Studies Session

Assessing public perceptions of ecosystem services in peri-urban Mediterranean wetlands.
Olivia Cason*, Universitat Autonoma Barcelona, Barcelona, Spain.

Increased interactions between people and natural spaces have resulted in greater demand for the ecosystem services (ES) that fluvial systems provide. The services and benefits of sustainably managed fluvial spaces in urban and peri-urban settings range from flood protection to water purification, and even improved mental well-being. While recent research has assessed public perceptions of Mediterranean rivers, there are limited investigations into the public perceptions of Mediterranean wetlands, especially in urbanized spaces like peri-urban parks. This study seeks to fill this literature gap by evaluating the various ecosystem services (ES) benefits and values that users of a peri-urban fluvial park in the Mediterranean region of Catalonia, Spain receive through the assessment of public perceptions among different sociodemographic groups. Park del Falgar serves as a backdrop to a fluvial restoration project that consists of a flow-through chain of aquatic ecosystems (stream, two wetlands, and a shallow lake) that have been restored to a nature-based solution that receives majorly treated water from a nearby wastewater treatment plant (WWTP) effluent and contributes to the retainment and transformation of nutrients through its self-purification capacity. To assess the perceptions of park users and their preference for different landscape elements at the park, we carried out a two-part survey consisting of a participant questionnaire using a 5-level Likert scale and a multiple-choice sociodemographic questionnaire. The key findings of this study revealed that age significantly influences perceptions of ES. Older park users were more likely to notice changes in the park's landscape, value its biodiversity, and have a greater awareness of the restoration project than youth. Additionally, we found that park users living in closer proximity to natural landscapes had higher awareness of recreational, leisure, and educational activities at the park and considered the wild aesthetics of the wetlands pleasing compared with users that do not live in close proximity to nature. We discuss employing different community engagement opportunities that empower the transfer of socio-ecological knowledge through participatory efforts that can capture the full range of ES benefits provided to people from the peri-urban fluvial park as we found that a general lack of knowledge and interest in the various cultural ecosystem services (CES) provided by the park may be caused by ineffective communication efforts. We conclude that more frequent visits to the park lead to a greater appreciation of the wetlands, and more investigations are needed to enhance wetland biodiversity awareness and interaction among different park users at the park.

Open space development and restoration in urban environments: Problems and solutions.
Declan Hogan*, Jamie Robbins*, Catherine Feeley-Leetz*, Dart Westphal, Manhattan College, Riverdale, NY, USA.

There are many challenges involved in developing, restoring open space resources in cities, particularly natural area resources. Some of these obstacles are physical, involving infrastructure such as highways, utilities and sports stadiums encroaching on parkland and other open space resources. There are also environmental impacts from surrounding areas including stormwater run-off, nutrient inputs such as fertilizers from golf courses and invasive species carried into the natural area from a number of vectors. Some of these obstacles are sociological, such as ideas about how cities are incompatible with natural ecosystems or how people in cities are not interested in open space or even any environmental issues at all. Green spaces have either been inaccessible for minority and lower income communities, or they have been used as an instrument of systemic oppression. Examples of this are Van Cortlandt and Central Parks. The Cross Bronx Expressway has been a physical barrier between the different areas of the Bronx. It clearly separates the Van Cortlandt Park neighborhood from the more diverse and impoverished areas like the South Bronx. The founding of Central Park was fueled by racism in the 1800s. A predominantly African American called Seneca Village was in the center of where Central Park now rests. This development pushed out people of color by creating a barrier and increasing the property values nearby. Lack of open space also fuels the urban heat-island effect. Low access to green spaces and urban heat islands are both issues that communities of color face. It is why we see more trees and grass in richer areas, and less access to green space in low-income communities. Strategies to deal with these obstacles include marshaling all levels of government to implement legislation and allocate funds to protect natural lands and partnerships with non-state actors to support this cause. Examples include New York Restoration Project and others working to improve and expand New York's green spaces and the recently established Inflation Reduction Act of 2022, where "the Forest Service received (funding)1…to support tree-planting, urban forest planning and management… particularly in disadvantaged communities". Such funding is coming to The Bronx is Blooming where a number of Manhattan College students are involved. Our Nu chapter students will report on how the work of groups such as this will provide solutions to overcome some of the obstacles to developing, preserving and restoring open space in cities.

Urban green spaces: How do development and management practices influence immigrant socio-economic integration? Lorenzo Maggio Laquidara*, Renee Richer, Duke Kunshan University, Kunshan, China.

Urban green spaces support city communities in numerous ways. Urban green spaces' ecosystem services include heat regulation (1), stormwater management (2), and improvements in public health, with decreases in morbidity, mortality, and public health costs (3). Migrant communities have been found to be among the most vulnerable resident groups in cities around the world (4), representing critically imperiled communities in the wake of urban-level climate change. This

study tests whether urban green space quality, approximated through development and management practices, improves migrant community integration. Urban green space development and management practices in North America Durham, NC and the Italian city of Bergamo were compared using US Forestry Department-Cities (HTHC) index. ArcGIS maps layered with Social Explorer census data provided a visual overview of segregation across city areas. Tree canopy cover was approximated with NDVI (normalized difference vegetation index) and EVI (enhanced vegetation index) layers generated with Google Earth Engine. In both cities, Hispanic/Latinx acted as case studies. Both the cities experienced their first Hispanic migration flows during the 1980s and 1990s (5). The resident communities are similar in number, socio economic status, and employment sector. Semi-structured interviews were conducted to document the communities' human-nature relationships with urban green spaces. Differences in tree canopy cover were evident, as well as pro-environmental attitudes and behaviors. Based on our findings, we hypothesize urban green space distribution and management to alleviate segregation by encouraging encounters with local residents, fostering a sense of mutual trust, and creating place attachment (6).

The moral dimensions of urban heat islands and walkability. Savannah Stevens*, University of North Texas, Denton, TX, USA.

Sidewalks are vital for mobility. They can help portray characteristics of safe mobility infrastructures in metropolitan areas. Aspects of safety within and between cities linking to sidewalks, or a lack thereof, inadvertently reveal parts of urban areas that go habitually unnoticed. When considering certain inconspicuous dimensions of cities, we often overlook parts of them associated with sidewalks. Examining under-noticed dimensions could help us distinguish safe areas for pedestrian mobility. For instance, dangerously warm temperatures are characteristic of less safe traveling conditions for pedestrian mobility. Studies show that communities in some municipalities experience excessively warmer temperatures than surrounding areas and are more likely to suffer consequences from the urban heat island effect. Intensely hot conditions can have life-threatening outcomes in communities. However, some of these life-threatening outcomes plague communities differently. While we should care about this topic because it involves preventable loss of life, examining it could help us reimagine sidewalks as infrastructures that can aid us in creating safer and more sustainable cities. Throughout this presentation, I analyze why we must take steps to lessen risks associated with urban heat islands to help mitigate accompanying harms and suggest possibilities for engaging with the present endeavor. To make this case, I first review how the effects of urban heat islands contribute to city life for different stakeholder groups while focusing on how urban heat islands and their hidden meaning affect urban dwellers. Next, I review the data on harmful conditions affecting communities by examining various impacts, such as decreased air and water quality and increased heat-related illness. Then, I explore ethical dimensions that aim to lessen associated

distress and tensions within municipalities. In conclusion, I make suggestions for future research topics.

Watersheds and the Coast Session

A logic model approach to evaluating how ecosystem services and equity fit into benefit-cost analysis frameworks. Fahmida Akhter*, Thomas Douthat, Louisiana State University, Baton Rouge, LA, USA.

Floods are the environmental hazard that causes the most human suffering, property damage, and economic losses in the Gulf of Mexico (GOM) region. Federal agencies, such as FEMA and USACE, fund flood mitigation projects and recovery programs. These agencies use benefit-cost analysis (BCA) (i.e., FEMA BCA toolkit 6.00) as a selection criterion to ensure projects are cost-effective, meaning there is a benefit-cost ratio greater than one. The current BCA framework faces challenges while quantifying the actual benefits or costs that represent the overall social welfare. Some of these challenges are incorporating the negative impacts of ecosystem services (e.g., disturbances, or alterations within the watershed) as well as incorporating the downstream impacts. Moreover, the BCA toolkits do not include mechanisms for valuing the distributional impact (i.e., equity) of mitigation projects, which requires identifying how damages differ among low-income and high-income communities. This paper will start to address these limitations in our current decision making tools via a conceptual logic model (LM) approach. The LM will diagram how environmental impacts (both positive and negative), as well as equity, interact with the BCA methodology. These comparative logic models will help to understand how potential benefits, harms, and trade-offs can be applied to watershed hazard mitigation contexts. Initially, we will develop a framework with all the components in the current the BCA toolkit. We will compare this status quo LM with LMs of the tools that incorporate additional values, such as impacts on upstream and downstream environmental quality, as well as the distributional impacts. The logic model will also incorporate the watershed perspective while specifying the target area as well as the downstream areas. Equity will be addressed using the concept of the marginal utility of income. The purpose of this logic model is to improve the decision-making process for flood mitigation projects so that it can evaluate the social welfare while including environmental benefits and ensuring equal benefits for the disadvantaged community.

Analyzing negative human-shark interaction trends at the shark bite capital of the world. Tyler Bowling*, University of Florida, Gainesville, FL, USA.

The rarity of shark bites makes analysis of trends and proper mitigation strategies difficult. However, New Smyrna Beach (NSB), FL, has the most recorded shark bites globally. Wounds are consistent with coastal requiem species, like *Carcharhinus limbatus* (Blacktip) or *Carcharhinus brevipinna* (Spinner) bite patterns. However, these two species' similarity makes identification from bite marks alone impossible. The International Shark Attack File (ISAF) is the largest and oldest repository of global shark bite records. ISAF records in the Southeast US are largely not attributable to a species due to the minor and non-species specific tooth marks. The ISAF records the prevailing environmental conditions during a shark-related incident involving a person. Collections of these incidents could show patterns of bites and associated environmental conditions. However, due to the lack of large enough datasets for fine-scale areas to show meaningful results, such aspects have not yet been rigorously explored in connection with human-shark interactions. NSB, FL, presents a unique opportunity to examine fine-scale shark bite trends. This work examined daily environmental records from NOAA databases and ISAF cases for NSB from 1990-2021 (n=210). The goal was to determine what environmental conditions were associated with historical bite patterns at NSB and if predictive models could be created to show the conditions and time of year shark bites were more likely to occur. Additionally, bite trends were compared to suspected species' life histories to determine the most likely culprit. Using several linear modeling techniques, I calculated the probability of a shark bite occurring under different environmental conditions. These findings will be used to develop mitigation strategies in collaboration with the NSB Beach Safety Office.

Connecting the dots: A process for mapping the socio-ecological network of sediment retention services in Puerto Rico and beyond. Mariam Valladares-Castellanos*, R. de Jesus Crespo, V. Mihunov, T.H. Douthat, Department of Environmental Sciences, Louisiana State University, Baton Rouge, LA, USA.

We describe a methodological approach to model linkages between supply and demand for ecosystem services (ES), focusing on sediment retention to identify clear connections between measures of service provision and end users throughout a Socio-Ecological Networks (SENs) framework. Understanding where an ES is produced and most vulnerable to disturbance can improve management and build strategies to reduce impacts such as sediment loads to drinking water reservoirs and declines in water quality on other surface and groundwater sources. We used as a case study the island of Puerto Rico, which has invested millions of dollars in sediment dredging to extend the lifespan of its most essential reservoirs in recent years. We applied a spatially explicit model, the Sediment Retention Model (SR) of the Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST), to build the ES supply. The model outputs sediment retention capacity as avoided sediment exports using the Land Use Land Cover (LULC), Digital Elevation Model, soil erosivity, and erodibility as inputs. To estimate the ES demand, we traced the network of water distribution lines to quantify the number of beneficiaries

and their location relative to the reservoir's water source. To do so, we used a combination of spatial and non-spatially explicit datasets as inputs. Finally, we characterized the level of protection and vulnerability of the sediment retention services by estimating the proportion under legal conservation status and the level of landscape fragmentation as elements that can affect the ES provision. Furthermore, due to the national and open-access nature of the datasets used in this study, the methodology could be applied to build the SEN in other locations. Our study provides a methodological framework for establishing the supply and demand of water purification services and demonstrating the importance of mapping Socio-Ecological Networks to justify conservation policies based on Ecosystem Services.

The historic influence of landscape and environment on development in the Halifax. Michael A. Reiter, Hyun Jung Cho, Department of Integrated Environmental Science, Bethune-Cookman University, Daytona Beach, FL, USA.

The Halifax River, a 37-km long estuarine lagoon along the eastern coast of Florida, is bordered by an essentially continuous string of coastal cities within the heavily developed Halifax River Urban Watershed (HRUW). The historic immigration, occupation, and development patterns of the Halifax River watershed were tightly linked to the expansion of access to the area, both aided and hindered by the physical geography of the region. Landscape features such as ridges and troughs from ancient shorelines and rivers imposed historic directional constraints (relatively north-south, N/S) on regional access. The easiest initial access routes were the Halifax River (and to the west the St. Johns River) and the coast, so early historic migration into the HRUW was likely to arrive by sea and river, with later land routes also largely following the N/S ridge and trough alignment rather than more difficult east-west routes. As external populations moved in, existing native populations had to deal with shared or even lost access to these more efficient travel corridors and the potential to be squeezed into lands between them, leading to conflict. The result was a piecemeal development pattern as immigrants tried to create new settlements, obtain resources, and generate stable profit in areas that were often already occupied and not particularly stable. While the new settlements and their associated economic activities impacted the surrounding environment, the difficulties of the landscape and disagreements with existing inhabitants combined with the challenging, dynamic ecology to leave relatively few remaining signs of those impacts beyond the locations of older towns along the early transportation routes. Beginning with the nineteenth century railroad, more modern technology has effectively eliminated the historic directional and ground cover constraints, resulting in expanding, intense development into previously inaccessible areas in and around the watershed. Ironically, though, much of the region's economic activity is still associated with aspects of immigration (e.g. retirees coming to the region), occupation (e.g. new housing and infrastructure), and development (e.g. agriculture, tourism). We may thus want to consider how much more ease of access and activity the region can actually support, and whether planning driven by these historic

themes is doing justice to the environment as well as all who would be affected today and in the future.

Relationship between land use and water quality in a tropical urban catchment of the Congo basin: Source to sink buffer scale approach. Sani Zouera[1]*, R. M. Tshimanga[2], H. K. Mbuyi[3], T. A. Basamba[4], N. O. Odume[5], [1]Regional School of water, University of Kinshasa, Kinshasa, Democratic Republic of Congo, [2]Congo Basin Water Resources Research Center – CRREBaC, University of Kinshasa, Kinshasa, Democratic Republic of Congo, [3]Renewable Energy Research Center, Department of Basic Sciences, University of Kinshasa, Kinshasa, Democratic Republic of Congo, [4]Department of Agricultural Production, Makerere University College of Agricultural and Environmental Sciences, Kampala, Uganda, [5]Institute for Water Research, Rhodes University, Makhanda (Grahams town) 6140, South Africa.

Pollution of freshwater resources, particularly rivers, is becoming a major concern worldwide due to the rampant human activities. A good water quality management strategy requires estimating how land use affects water quality variation across space (multiple buffer scales) and time (season). N'Djili River is a vital water source for various uses in Kinshasa. However, the river's lower course is under immense pressure due to uncontrolled urbanization, informal settlements, improper waste management practices and vegetation degradation. This study aims to determine the relationship between land use and river water quality in the N'Djili river basin lower course. Water samples physico-chemical and bacteriological quality was assessed; two types of water samples were collected - one for hydro-chemical analysis and the other for bacteriological investigation. Land use categories were determined based on sites buffer scaling using Sentinel-2 land cover 2022 imageries. Ten sampling sites were selected along the river course for land use and water quality data collection. A redundancy analysis was performed in view to determine the relationship between land use and water quality. Laboratory analyses show a physical, chemical and biological pollution of N'Djili River water. The redundancy analysis revealed that 70% of water quality parameters were explained by the studied land use categories. The total variation explained by land use indicators on water quality parameters was higher at 100m buffer scale than 500m scale. The first explanatory land use variables at all buffer scales was built area (51.06-69.75%). The results also indicated that built-up areas had negative effects on water quality parameters, while trees and rangelands had positive impact.

Online Workshops

ABC's of Grant Writing Workshop

Directed by Heather Carpenter, Ph.D. Interim Executive Director of the Institute for Nonprofit Administration and Research, Director of the Master of Science in Nonprofit Administration program, and Norman A Dolch Super Professor at LSU Shreveport.

Dr. Heather Carpenter's mission and passion are to help people run more effective organizations and accelerate people's nonprofit careers. She is a highly networked professor, researcher, and trainer and was named a 2022 Top 50 Power and Influence Nonprofit Leader by the Nonprofit Times. She has co-authored the following books: Nonprofit Crisis Management: Response to COVID-19 and The Talent Development Platform: Putting People First in Social Change Organizations and co-edited the Teaching Nonprofit Management textbook. Dr. Carpenter also serves as the Co-Editor in Chief of the Journal of Nonprofit Education and Leadership and Board Treasurer of the Nonprofit Academic Centers Council. She earned her Ph.D. in Leadership Studies with an emphasis on Nonprofit and Philanthropic Leadership from the University of San Diego and a Master of Management in Nonprofit Administration from North Park University in Chicago, Illinois. Before pursuing her Ph.D. Dr. Carpenter ran nonprofit organizations in Illinois and California.

This workshop will cover the ABC's of grant writing. How to search and find grant opportunities from all different types of funding sources, how to write a letter of inquiry and a grant proposal, and how to do grant reporting once you have received the grant. By the end of the workshop, attendees will have a better understanding of the types of funding available to them and how to write a grant and apply for funding.

Coastal Botanical Drawing Workshop

Directed by Clair Gaston, BFA, MFA. Artist and Naturalist.

A lifelong naturalist, artist, and native Texan, Clair Gaston has always been interested in painting and drawing. She holds a BFA and an MFA in Painting and Drawing and has been teaching painting and drawing for over 20 years and currently teaches at The Art School of The Contemporary Austin, The Denver School of Botanical Art and Illustration, and private classes.

Her work has been shown throughout Texas, and on the East Coast. She works in her studio in Round Rock.

Using art as a medium to communicate the changes that are occurring in oceans and marine environments allows for a deeper understanding and reflection on how climate change is affecting coastal ecosystems. This workshop will focus on coastal plants and shells that are native to the Louisiana Coast, and will be adapted to all skill levels.

GIS Workshop for Environmental Research and Climate Change

Directed by Peter Siska, Ph.D. Professor of Biological Sciences, Louisiana State University Shreveport.

The increasing level of human impact on the environment is resulting in the development of research initiatives with spatial applications. Numerous problems that we face today are closely tied to spatial and temporal aspects of the environment such as changes in coastal habitat, human development, health hazards, and the conservation of natural resources. The nature of an environmental investigation is spatial; therefore, spatial methods are necessary for developing a better understanding of studying these phenomena. Geographic Information Systems is a valuable resource and technology for providing solutions to the complexity of these problems. For several years, ecologists and environmentalists have been studying the Louisiana coastal area ecosystem to investigate the changes in the coastal ecosystem due to climate change.

The aim of this workshop is threefold:

1. The first stage will be dedicated to the understanding of spatial data and learning the differences between spatial reference systems in a database management system where the selection of data in an attribute table is connected to coordinate systems. The understanding of shapefiles is also necessary.
2. In the second stage, we will focus on accessing, modifying, and analyzing online resources, especially ESRI spatial data. One of the resources is from the Louisiana coastal area. This complex geographic data also has large attribute values. They will be exported as shapefiles and analyzed.
3. In the third stage, the training session will focus on creating choropleth maps from environmental data. In the real world, data are often measured and collected in the field and stored in tables such as excel files. GIS has the capability of joining these data with coordinate systems and producing choropleth maps.

The capturing, displaying, analyzing, and visualizing of spatial data is necessary for a more complete understanding of real life problems. Most solutions in science offer non-spatial data where coordinate systems are absent. Such information is incomplete. The distribution of measurements often follows a spatial pattern that can only be revealed by using spatial analysis methods and tools that are incorporated in GIS. The Arc Toolbox consists of a large number of

analytical tools that have strong practical applications. During this session, we will use the tools that will be useful for environmental research.

Resume Building and Cover Letter Writing Workshop

Directed by Araceli "Sally" Perez-Ramos. Career Service Expert.

Araceli "Sally" Perez-Ramos has worked within Career Services for the past 17 years overseeing programming initiatives and advising undergraduate and graduate students, internship programming, and marketing and communications outreach. Sally works at Wake Forest University School of Business within the Market Readiness and Employment department as an Associate Director & Career Coach advising students in the Master of Science in Business Analytics program. She has served as a past president of the Texas Cooperative Education & Internship Association, former Chair of the Technology and Small Colleges and Universities Knowledge Groups, and the Conference Marketing Committee for the Southern Association of Colleges and Employers. Previously, Sally has worked at The University of Texas-Pan American and St. Edward's University. Sally earned her Master's in College Student Development from St. Edward's University and her undergraduate in Political Science at the University of Texas-Pan American.

This workshop offers a remarkable opportunity to gain professional guidance, personalized advice, industry insights, networking prospects, and a confidence boost! Attendees will benefit from tailored advice to craft a standout resume that effectively showcases their exceptional qualifications to prospective employers.

The 28th International Interdisciplinary
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Founded in 1967, LSU Shreveport is a regional four-year institution offering a wide array of nationally accredited undergraduate and graduate degrees as well as a doctoral degree in an accessible, student-centered environment in north Louisiana. LSUS serves a student population of more than 8,500 including both traditional and online students from the US and abroad. Offering both undergraduate and graduate degrees in biological science, LSUS affords students the opportunity to explore concentrations in cellular and molecular biology, environmental science, field and organismal biology, and forensic science. Learn more about the university at LSUS.edu.

Established as a nonprofit organization in 2015, SECORE International, Inc. is dedicated to the conservation and restoration of coral reefs. SECORE stands for SExual COral REproduction, which refers to SECORE's Coral Seeding approach for reef restoration: taking advantage of the corals' own reproduction potential to develop scalable methods and technologies. Breeding corals from collected coral spawn allows us to produce huge numbers of baby corals out of one spawning event while at the same time supporting genetic diversity and consequently promoting reef resilience. SECORE's work is based on scientific best practices, translating experimental and field study findings into innovative, applicable technologies to sustainably restore coral reefs on an ecosystem-level.
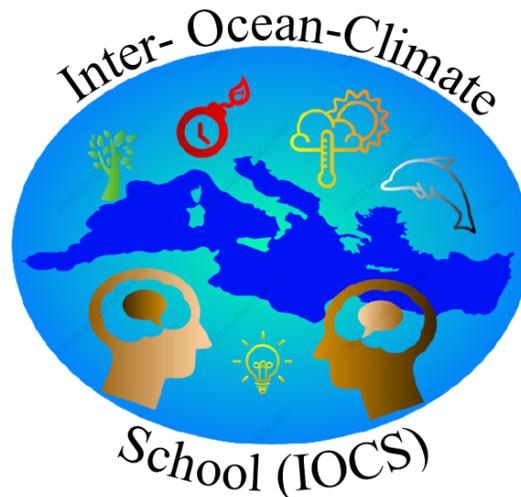
The Inter- Ocean-Climate School (IOCS) runs short, interdisciplinary courses on the ocean-climate-humanity nexus. Its objective is to enable a diverse range of stakeholders to become ocean-climate-humanity literate. A wide range of topics is covered, including sustainability, biodiversity, causes and consequences of climate change, and interactions among

the ocean, climate, coasts and human activity. Several skills are enhanced, covering teamwork, negotiation, writing and critical thinking. A range of active learning methodologies are employed, especially educational games, participatory simulation, debriefing and online interaction.

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