



The Interdisciplinary Environmental Association (IEA) and the Urban Environmental Studies Program at Birmingham-Southern College present the 27th International Interdisciplinary Conference on the Environment, IICE, October 6th - 7th 2022 organized virtually in Birmingham, Alabama.



Interdisciplinary  
Environmental  
Association



## The 27th International Interdisciplinary Conference on the Environment

### Design Description

The official designs for the 27th International Interdisciplinary Conference on the Environment, IICE, were created by Elana Morechower and Justin Slaughter. The designs strive to bring attention to rare, native, and endangered species in the state of Alabama while reinforcing the inadmissible intersectionality between ecological and social justice. Considering the state's rich history, Alabama is a haven for biodiversity and is ranked 1st. in the eastern U.S. and 4th in the nation for species diversity. To represent this achievement, the three species depicted in both designs are native to Alabama and are either rare or endangered. For instance, the native Prothonotary Warbler, whose home nestles between swampy wetlands and whose song can be recognized by ornithologists and local Alabamians alike, is under a conservation watch as its population continues to decline from wetland deforestation across the southeastern United States.

Alabama is also home to America's Amazon, the Mobile River Basin, which spans three states and accounts for 14% of all freshwater flows in the continental U.S. It quenches the thirst of millions. Yet, it is threatened by mismanagement, waste, and overconsumption. The basin is depicted as a hand-drawn body of water vividly flowing downstream in a faded-glory blue. The national amphibian is the Red Hills salamander. It is endemic, only found in six counties across Alabama, and is under a threatened species status. In both designs, it represents a choice. Will we choose to find sustainable solutions that defend biodiversity, or will we choose more loss, sorrow, and the absence of rarity in this world?

The hand holding the salamander in the digital design has two American Hart's Tongue Ferns around it. Due to its unique habitat and rarity, it is considered a threatened species in Alabama. In the hand-drawn logo, the ferns are in a budding form and reaching upward. Its position represents how our natural world is constantly evolving and how its reach affects all living things. Alabama's many ecosystems are an essential piece to understanding how our lives are affected by the climate crisis. As citizens of this great state, we must educate others on the rare, endangered, and beautifully unique plant and animal life in Alabama. In the same way, scientists inform through data and reports, we convey knowledge through art and empathy. Notice that our designs do not solely reflect Alabama's biodiversity, but also draw attention to the many People of Color who are in many ways more vulnerable to the effects of global warming, and the subsequent environmental injustices that follow.

Both logos are fierce in their stance to raise awareness against environmental racism. We believe that change is in collective action that empowers all living things, while particularly giving voice, and listening to historically vulnerable and indigenous communities. As we come together for the IICE from our different disciplines and backgrounds, we hope that these designs serve as a reminder of what we have been gifted, and as a warning of what is at stake if we continue to resist today's climate realities.

## Hopin Link

<https://hopin.com/events/27th-international-interdisciplinary-conference-on-the-environment>

### Schedule of Events

**CDT -500 Birmingham, Alabama Local Time**

<b>Date</b>	<b>Session</b>	<b>Title</b>	<b>Speaker</b>	<b>Time</b>
Oct. 6,2022	Greeting	Presidential Address	Greg Cronin Ph.D.	9:00
Oct. 6,2022	Greeting	Land Acknowledgement	Miguel Saugue Sr.	9:15
Oct. 6,2022	Greeting	Greeting	Bill Holt Ph.D.	9:35
Oct. 6,2022	Logistics	Navigate Hopin	Olivia Cason	10:00
Oct. 6,2022	Network	Network Room!	All attendees	10:15
Oct. 6,2022	Climate Change	An Interdisciplinary Literature Review of Arctic Climate Change - A “Wicked Problem	Cicely Sinclair, University Autonoma Barcelona	10:30
Oct. 6,2022	Climate Change	Neural function and decision-making following rapid heat stress	Cory Coehoorn, Ph.D Professor of Kinesiology and Health Science, Louisiana State University Shreveport	10:50
Oct. 6,2022	Climate Change	Little Island with big problems:The Isle de Jean Charles, coastline change and environmental justice	Peter Siska, Ph.D. Professor of Biological Sciences, Louisiana State University Shreveport	11:10
Oct. 6,2022	Break	Network Room!	All Attendees	11:30
Oct. 6,2022	Population Connection	Solutions Through Women’s Empowerment: Why Health and Education Matter to Climate Change	Hannah Evans Senior Analyst at Population Connection	12:00
Oct. 6, 2022	Climate Change	Geomorphometric characterization of	Chloe Campo,	12:45

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		landslides following the 2 October 2020 Alex Storm in the Alpes-Maritimes Valleys, SE France.	Institut Mediterranéen du Risque, de L'environnement et du Développement Durable, Université Cote d'Azurs	
Oct. 6,2022	Climate Change	Developmental Effects of Heatwave Exposure in Mosquitoes	Bryce Moulton. Tulane School of Public Health & Tropical Medicine	13:05
Oct. 6,2022	Lunch	Network Room!	All Attendees	13:25
Oct. 6,2022	GIS Workshop	Climate change & GIS Workshop	Peter Siska Ph.D., Louisiana State University, Shreveport	14:30
Oct. 6, 2022	Sustainability and Stewardship	Co-constructing a platform for impact analysis and reflexivity of sustainability projects in Mexico	Paola M. García-Meneses Ph.D., Universidad Nacional Autónoma de México	16:30
Oct. 6,2022	Sustainability and Stewardship	The Effects of Environmental Organizations on an Individual's Pro-Environmental Behavior	Asli Guler, State University of New York at Buffalo	16:50
Oct. 6,2022	Sustainability and Stewardship	Evan's Blue Assay Evaluation of the KED Signaling Pathways Possible Wound Response Function in Tomato Plants	Annalise Welman, Florida Atlantic University	17:10
Oct. 6,2022	Sustainability and Stewardship	Understanding History to Inform Urban Wildlife Governance	Pooja Kumar, MCIP, RPP, Planner, City of Yellowknife.	17:30
Oct. 6,2022	Sustainability and Stewardship	Ethics in Agribusiness: Justice and Global Food in Focus	Shane Epting Ph.D. Missouri University of Science and Technology	17:50
Oct. 6, 2022	<b>End Of Day 1</b>			18:10

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<b>Date</b>	<b>Session</b>	<b>Title</b>	<b>Speaker</b>	<b>Time</b>
Oct. 7, 2022	Panel Urban Environmental Studies Program BSC	Research experiences in fisheries conservation biology for BSC environmental science students	Mark Meade Ph.D., Connors Landwehr, Caroline Teal, Paige Washington, Hannah Hughes. Birmingham-Southern College	9:00
Oct. 7, 2022	Urban Environmental Studies Program BSC	Beyond Town and Gown: Engaged Learning Programs in Urban Environmental Studies	Bill Holt Ph.D. Birmingham-Southern College	9:30
Oct. 7, 2022	Urban Environmental Studies Program BSC	Environmental Racism in Birmingham, AL, and the Greater Community	Elana Morechower, Birmingham-Southern College	10:00
Oct. 7, 2022	Break	Networking Room!	All Attendees	10:20
Oct. 7, 2022	Keynote	Lessons Learned	Lois Marie Gibbs	11:00
Oct. 7, 2022	Lunch	Network Room!	All attendees!	12:00
Oct. 7, 2022	Environmental Education	Defining the Natural State Using STEAM: Fundamentalism, Sustainability and Change	Michael A. Reiter Ph.D. Bethune-Cookman University, Kimberly D. Reiter Ph.D. Stetson University	13:00
Oct. 7, 2022	Environmental Education	Future Focus Films	Jeremy Robson	13:20
Oct. 7, 2022	Environmental Education	Footprint App Inc.	Kelly Poirier	13:40
Oct. 7, 2022	Alabama Rivers Alliance	2022 Southern Exposure Films	Michelle Forman, Series Producer for Southern Exposure Films	14:00
Oct. 7, 2022	Habitat Loss and Degradation	Distribution of carrion-associated beetles and their phoretic mites along an	Kennedy Norris, , Jacksonville State University	15:00

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		urban-rural gradient in northeast Alabama.		
Oct. 7, 2022	Habitat Loss and Degradation	Preliminary Observations of the Potential Ecological Impacts of the Non-Endemic Cherry Laurel ( <i>Prunus caroliniana</i> ) on Plant Species Diversity in a Tennessee Urban Woodland	Raegan Wilburn, Rhodes College	15:20
Oct. 7, 2022	Habitat Loss and Degradation	Louisiana's worst invasive species	Jackson Wheat, Louisiana State University, Shreveport	15:40
Oct. 7, 2022	Habitat Loss and Degradation	Antimicrobial Properties of <i>Salvinia molesta</i> on Common Bacteria.	Amy Erickson Ph.D. Louisiana State University, Shreveport	16:00
Oct. 7, 2022	Habitat Loss and Degradation	The PFAS Crisis: "Forever Chemicals" in Our Water	Brian Salvatore Ph.D. Louisiana State University, Shreveport	16:20
Oct 7, 2022	Network	Network room!	All attendees	17:20
Oct 7, 2022	<b>End of Day 2</b>			17:30

## Special Address

**Greg Cronin Ph.D.**, President, Interdisciplinary Environmental Association

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.

**Bill Holt Ph.D./J.D./M.C.P.**, Associate Professor and Coordinator of the Urban Environmental Studies Program at Birmingham-Southern College

William Holt is coordinator of the Urban Environmental Studies (UES) Program and Co-Chair of Architectural Studies at Birmingham-Southern College. Holt earned his BA in Geography from the University of Georgia. While completing his MCP at Georgia Tech, Holt worked on the 1996 Summer Olympics planning programs. He served as a long range planner with the National Capital Planning Commission on the 2050 Monumental Core Plan for Washington, D.C. Holt earned a Ph.D from Yale in sociology and a J.D. from Vermont Law School with a focus on energy law. He edited two books on urban regions and sustainability. Holt's research focuses on debates over cultural history in the built environment, the back to the land movement as well as work on EPA Superfund redevelopment sites. He conducts applied student-faculty consulting work through the US EPA's College/Underserved Community Partner Program (CUPP).

**Hannah Evans**, Senior Analyst at Population Connection

Hannah is interested in working with students, professors, and activists to promote positive social and environmental change. Hannah's work investigates the ways in which population dynamics intersect with global social, political, economic, and environmental systems and advocates for integrated developmental solutions that simultaneously combat climate change and societal injustices. She develops and gives comprehensive, solution-oriented presentations focused on the connections between global population growth, access to health care and education, women's empowerment, and climate adaptation. Through an examination of some of the root causes of high fertility, her work seeks to highlight the interconnections between poverty, resource use and consumption, population pressures, women's rights, and environmental challenges made worse by climate change. She is Senior Analyst at Population Connection, where she focuses on public speaking and the development of open-source, academic-style resources. She also cultivates international partnerships and manages social media strategy and outreach. Before joining Population Connection's staff, Hannah worked as an adjunct professor

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of Women's Studies and taught classes on gender, science, and feminist theory. She has non-profit experience working as a program developer for sustainable agriculture and public health programs in Honduras and Panama and has worked as a researcher studying food security issues throughout Southern California. Hannah holds a BA in Environmental Policy and Natural Resource Conservation and Political Science and a Master's in Political Ecology from San Diego State University, where her research focused on sustainability labeling and ethical consumption between the United States and Nicaragua.

### **Jeremy Robson, Creator and Producer of Future Focus Films**

For as long as creator and producer of Future Focus Films Jeremy Robson can remember he's loved everything that has to do with film, especially documentary films. It has always fascinated him how journalists travel to far-flung areas across the globe and produce the most riveting stories. He always told himself that one day, that would be him. Fast forward to 2020 and Future Focus Films was born. Jeremy's film career started in the multimedia department of Amnesty International in London, and later in sustainability consultancy ERM as a video producer. His passion lies in the creation of his own films where he focuses on engaging his audience on all topics related to the environment, especially in the areas of sustainability and innovation. An environmentalist at heart, he uses his talents in filmmaking to capture both today's most pressing environmental threats and the diverse ideas that are driving solutions to the climate crisis, pollution, urban encroachment, deforestation, and habitat destruction.

### **Miguel Saugue Sr., Founder of Caney Indigenous Spiritual Circle**

Miguel Sague Sr. is a descendant of the ancient indigenous people of the Caribbean islands near the Central American mainland. He was born in a region of Cuba reputed to be the ancestral center of a historical Taino community that survived the colonization process fully into contemporary times. He immigrated along with his family at the age of 10 to the US in 1961. Here in North America he dedicated himself to learning as much as he could about his own Indigenous legacy as well as informing himself on the culture, history and tradition of as many of the rest of the Indigenous people of the Americas as he could. In 1981 Miguel collaborated with a number of friends to found a ceremonial community called the Caney Indigenous Spiritual Circle. As part of the leadership of the Caney Circle Miguel has cooperated with other Indigenous people and non-indigenous allies in furthering causes that promise to improve the lives of Indigenous people, and all people, all over the world.

### **Kelly Poierier, CEO and Co-Founder of Footprint App Inc.**

Kelly has multiple years of experience as a sustainability consultant, business development expert, and community engagement specialist. With a bachelor's degree in psychology and a master's degree in sustainability leadership, Kelly brings her diverse education background to lead corporate engagement programs on behalf of Footprint App, Inc. that result in long-term sustainable habit formation and cultural changes within organizations. In addition to her

leadership in the climate field, Kelly is also a member of Zonta International, campaigning to fight violence against women through advocacy and fundraising.

**Michele Forman, Series Producer for Southern Exposure Films**

Michele Forman is an award-winning documentary filmmaker and co-founder / director of Media Studies at the University of Alabama at Birmingham. Michele gained her experience as an executive in feature films. As Director of Development at Spike Lee's 40 Acres and a Mule Filmworks, she was responsible for the acquisition and development of new projects. In addition, Forman served as associate producer on Mr. Lee's Academy Award-nominated film *4 Little Girls*, a feature-length documentary for HBO about the bombing of the Sixteenth Baptist Church in Birmingham, Alabama, in 1963. Since then, Forman has been directing and producing documentary projects for film and television, earning an Emmy nomination for *Coat of Many Colors* (2001). Her feature-length documentary *Climb for the Cause: A Breast Cancer Story* (2007) documents five women who became activists for women's health after surviving breast cancer. The film sent Forman up Mt. Kilimanjaro, one of the world's tallest peaks. She also produced the multiple award-winning documentary *Alabama Bound* (2017), which explores the legal roller-coaster ride of LGBTQ family rights in the South over the last decade.

## **A Special Screening from Alabama Rivers Alliance**

### **2022 Southern Exposure Films**

Alabama Rivers Alliance, ARA, is a statewide network of groups working to protect and restore all of Alabama's water resources through building partnerships, empowering citizens, and advocating for sound water policy and its enforcement. Every summer, Alabama River Alliance hosts Southern Exposure, a film fellowship program that is actively raising awareness about Alabama's incredible natural resources and important environmental issues that impact all its citizens. This innovative summer fellowship brings emerging filmmakers from across the country to tell authentic, engaging stories through short documentary films about Alabama's environment — and the people who cherish it — from the mountains to the coast. The fellowship is made possible through the support and partnership with environmental and conservation groups across the state, where Southern Exposure fellows have the opportunity to create inspiring, captivating films that give viewers a sense of how much Alabama has to offer and the importance of protecting its resources. As a result of these poignant stories depicting the triumphs and challenges facing the state, numerous films from past fellowship years have been selected for screening in juried film festivals around the country!

## Honorary Keynote Speaker

### **Lois Maire Gibbs**, American Environmental Activist and Mother of the Superfund

In the spring of 1978, a 27-year-old housewife named Lois Gibbs discovered that her child was attending an elementary school built next to a 20,000 ton, toxic-chemical dump in Niagara Falls, New York. Desperate to do something about it, she organized her neighbors into the Love Canal Homeowners Association, struggling for more than two years for relocation for the families of Love Canal. Opposing the group's efforts were the chemical manufacturer, Occidental Petroleum, as well as local, state and federal government officials. In October 1980, President Jimmy Carter delivered an Emergency Declaration which moved 900 families from this hazardous area and signified victory for the grassroots community.

As a result of her work at Love Canal in December 1980 President Carter signed new federal legislation called the Superfund to address the thousands of other toxic sites across the nation. Lois is often referred to as the mother of Superfund.

During the crisis, Lois received numerous calls from people across the country who were experiencing similar problems. This revealed to her that the problem of toxic waste went far beyond her own backyard. In April 1981, Lois created the Center for Health, Environment and Justice (CHEJ), an organization that has assisted over 12,000 grassroots groups with organizing, technical, and general information nationwide.

Lois has been recognized extensively for her critical role in the grassroots environmental health and justice movement. She has spoken at numerous conferences and has been featured in hundreds of newspaper articles, magazines, and textbooks. Lois has appeared on many television and radio shows including 60 Minutes, 20/20, Oprah Winfrey, Good Morning America, The Morning Show and the Today Show. The many awards she has received include the first Goldman Environmental Prize in 1990, Outside Magazine's "Top Ten Who Made A Difference Honor Roll" in 1991, the 1998 Heinz Award, the 1999 John Gardner Leadership Award from the Independent Sector, and in 2003 Lois was nominated for the Nobel Peace Prize.

She has received five honorary Phds from the State University of New York, Cortland College (1992), Haverford College (2006) and Green Mountain College, (2009), Medaille College (2011) and Tufts University (2013).

#### **Publications:**

Gibbs, Lois and Levine, M. Love Canal My Story; State University of New York Press, 1982

Gibbs, Lois; Love Canal - The Story Continues; New Society Publishers, 1998

Gibbs, Lois; Love Canal and Birth of the Environmental Health Movement, Island Press, 2011

Gibbs, Lois; Dying From Dioxin, South End Press, 1995

Gibbs, Lois; *Achieving The Impossible*, CHEJ, 2008

Gibbs, Lois; *When We Change The Climate, We Change The World*, Tools for Grassroots Activists, Patagonia, 2016

## **Urban Environmental Studies Program at Birmingham-Southern College**

### **Panel and Presentations**

**Research Experiences in Fisheries Conservation Biology for BSC Environmental Science Students.** Dr. Mark Meade, Connors Landwehr, Caroline Teal, Paige Washington, and Hannah Hughes, Birmingham-Southern College.

Hands-on experience is often necessary for students entering the environmental science job market. Knowledge and practical skills in field methods can make the difference between getting that first internship or job. Students enrolled in Urban Environmental Studies classes at Birmingham Southern College get that experience in many classes. This panel includes UES students as well as non-major students that have completed experiential learning classes. The panel will define those experiences and discuss the relevance to their educational endeavors.

**Beyond Town and Gown: Engaged Learning Programs in Urban Environmental Studies.** Bill Holt Ph.D./J.D./M.C.P., Associate Professor and Coordinator of the Urban Environmental Studies Program, Birmingham-Southern College

The Urban Environmental Studies (UES) Program at Birmingham-Southern College (BSC) focuses on sustainability from environmental, economic, socio-political, and cultural perspectives linking American South, Global North, and Global South issues. Students are provided numerous opportunities to participate in engaged learning opportunities. Started through the US EPA's College/Underserved Communities Partnership Program and continued through the Community and College Partners Program (C2P2), the UES Program works with the city of Bessemer, AL. Originally a planned industrial town, Bessemer experienced economic and community downturns as American industries globalized in the 1980's. However, the majority Black working class city reinvented itself as a manufacturing and assembly center. Today, Bessemer has attracted \$1.9 billion in investments over the past decade from companies like Amazon and Carvana to its largest investment, Smucker's. Through engaged learning projects BSC students have developed visioning projects for the city's new master plan, a Broadband needs survey, and a community history project. This panel explores the role of engaged learning with community revitalization.

**Environmental Racism in Birmingham, AL, and the Greater Community.** Elana Morechower, Birmingham-Southern College.

Environmental racism defines environmental injustices that disproportionately affect people of color. The subject addresses intentional or unintentional targeting of historically excluded populations by means of exposure to toxic chemicals, carcinogens, and various other forms of pollution. Environmental racism is prevalent in the Birmingham area. Communities of color have voiced concerns numerous times, only to be ignored by those in power. Redlining, relocating harmful industrial plants, and producing steel account for just some of the many detrimental practices that are affecting marginalized groups of people. Environmental racism is a systemic issue that pervades throughout not only Alabama, but the whole world.

## **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 Louisiana coastal area. This complex geographic data has also 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.

## Conference Abstracts

### Climate Change Session

#### **An Interdisciplinary Literature Review of Arctic Climate Change - A “Wicked Problem”**

Cicely Sorcha Sinclair, Autonomous Universidad de Barcelona, Professor Graham Mortyn  
Departamento de Geografía, PhD in Oceanography, Autonomous Universidad de Barcelona  
(UAB)

The purpose of this literature review is to draw attention to the interlinked problem that is climate change in the Arctic, by demonstrating that it exemplifies a “Wicked Problem”- a complex, multi-dimensional challenge due to incomplete, contradictory or changing requirements and factors. Thus, it can be argued that it must be dealt with from an interdisciplinary approach. Various aspects of the Arctic ecosystem are being affected by rapid climate change. Huge areas are undergoing record ice-melt, ocean temperatures are rising, and air pollution is increasing, particularly on major shipping routes. Air temperatures are reaching record highs and ocean acidification is becoming a high-profile issue in Arctic waters. Biodiversity is affected: Arctic flora and fauna are struggling to adapt to rapidly changing environments, causing problems for those higher up the food chain, including indigenous peoples and traders. This review asserts that anthropogenic climate change and greenhouse gasses (GHGs) are the main climate drivers of much of the change occurring in the region. The global effects of Arctic climate change have been recognised in the form of diverging global weather systems leading to increasingly strong and unusual weather events, reduced biodiversity leading to trade and economic decline, and the imminent risk of huge stores of carbon escaping due to the melting permafrost. We find that the degradation of the Arctic is featured increasingly in global news reports, and the urgency of the problem is widely accepted in the academic community. We present a review of current literature, laying out the many problems that Arctic regions are facing and how they are interconnected. We argue that, given the multi-faceted nature of this problem, the best way to address it is through an interdisciplinary approach

**Developmental Effects of Heatwave Exposure in Mosquitoes.** Bryce Moulton, Tulane School of Public Health & Tropical Medicine. Dr. Kim Medley and Dr. Katie Westby Washington University of St. Louis Tyson Research Center.

Our present study tracks the fitness of *Aedes Albopictus* mosquitoes from eight distinct populations along the gradients of temperature zones that compose the Eastern United States under in the face of heatwaves. The mosquitoes were broken into cohorts with six replicates and two controls each and exposed to heatwave conditions for a select number of days and monitored to determine survivorship and raised to adulthood to compare wing morphometrics between the populations as a means determine several factors pertinent to fitness as sexually mature adults. This research project is currently ongoing and is conducted under Drs. Kim Medley and Katie Westby at Washington University of St. Louis Tyson Research Center.

**Geomorphometric characterization of landslides following the 2 October 2020 Alex Storm in the Alpes-Maritimes Valleys, SE France.** Chloe Campo, Institut Méditerranéen du Risque, de l'Environnement et du Développement Durable, Université Côte d'Azur. Supervised by Marie Malascarbes, CEREMA

Landslides and subsequent debris flows triggered by heavy rainfall are some of the most catastrophic natural phenomena in Europe that lead to loss of infrastructure, homes, and lives. The Tinée, Vésubie, and Roya valleys of the Alpes-Maritimes department in southeastern France experienced the catastrophic impacts of rainfall-induced landslides and debris flows during the Alex Storm on October 2nd 2020. The geomorphometric attributes of a slope strongly influence rainfall-induced landslide susceptibility. Therefore, this study seeks to identify distinguishing geomorphometric attributes that are conducive to landslide initiation. The geomorphon classification from the r.geomorphon GRASS tool, slope angle, slope aspect, plan curvature, tangential curvature, and profile curvature from the r.slope.aspect GRASS tool of the landslide areas and a surrounding 25 m non-sliding buffer zone prior to failure were calculated in order to gain insight into the triggering mechanisms of shallow landslides in the Alex Storm. The r.geomorphon tool yielded greater occurrence of spur geomorphons in the buffer zone compared to the landslide zone. Spur geomorphons have pronounced convexity that may aid the stability of the buffer zone. In contrast, the landslide polygons were dominated by slope and hollow geomorphons, geomorphons which encourage flow convergence and accumulation. Differences in slope angle and slope aspect between the landslide polygons and the buffer zone were also distinguished. The geomorphometric analysis revealed that the slope angle, slope aspect, planar and concave attributes of the slopes prior to failure allowed the accumulation and infiltration of rainfall in the soil, increasing the pore-fluid pressure to a point which triggers shallow landsliding.

**Little island with big problems: The Isle de Jean Charles, coastline change and environmental justice.** Peter Siska, Department of Biological Sciences, Louisiana State University at Shreveport.

During the last decade, a tiny island in the Gulf of Mexico near the coast of Louisiana has become the center of attention. The Isle de Jean Charles consists of only 320 acres, yet it is known as the “first place in the United States from where people had to move away due to rising ocean water.” Because Native American tribes (Biloxi-Chitimacha-Choctaw) have occupied this island, the current relocation efforts have also become part of an international discourse with political, social, and cultural consequences. Even though rising sea levels in the world is due to global warming, some human factors can be locally more pervasive than global warming itself. The gradual disappearance of the Isle de Jean Charles is caused by several factors; for example, oil exploration and the removal of underground resources have had an impact on the island and it is sinking. The East Texas and Louisiana coastal areas have been heavily exploited for oil and gas resources and there is no surprise that the land is subsiding. Another human factor that has significantly impacted this coastal area are economic activities along major rivers such as the Mississippi and Atchafalaya that used to bring large amount of sediments into the shallow coastal area of Louisiana. Therefore, the ideal solution for the Island would be to increase the accretion of sediments on the island and build it back to 22,000 hectares as it used to be. In addition, the Core of Engineers should include this island into the planned levee construction to protect it from major floods, storms, and hurricanes. The purpose of this project is to analyze and visualize the changes in the coastal ecosystems in Louisiana due to rising seawater in the Gulf of Mexico. The raster data from NOAA are used in Geographic Information Systems to study changes in coastal plant communities and references are made with respect to the disappearance of the Isle de Jean Charles. The Isle de Jean Charles has a special place in American history because it is closely connected to the rights of indigenous people for self-determination, freedom, the preservation of their culture and rights. Hence, the science and cultural norms are significantly challenged in the coastal areas and they represent an intriguing object of investigation for further ecological and environmental studies.

**Neural function and decision-making following rapid heat stress.** Cory Coehoorn, Professor of Kinesiology and Health Science at LSU Shreveport

There is no research to date evaluating the effects of rapid and uncompensable core temperature ( $T_c$ ) acquisition, as which occurs when one is wearing personal protective equipment (PPE), on neural function in prefrontal cortex and decision-making performance. **PURPOSE:** To study the effects of rapid and uncompensable  $T_c$  acquisition on neural function in prefrontal cortex and decision-making performance during a pre-and post-exercise Go/No-go test. **METHODS:** Fifteen male subjects (mean age,  $32.7 \pm 12.2$  years) performed an incremental exercise test to a termination criterion in CONTROL and GEAR. Electroencephalography (EEG) data was recorded during a Go/No-go test pre- and post-exercise. Decision-making performance was also

monitored during the pre-and post-exercise Go/No-go test. Heart rate (HR), thermal comfort scale (TCS), thermal sensation (TS), and rating of perceived exertion (RPE) were recorded at each 0.5°C increase in Tc. **RESULTS:** There were significant differences in time to termination (TTT) (CONTROL = 77.3 ± 12.6 min; GEAR = 50.3 ± 6.9 min), pre-exercise HR (CONTROL = 76.8 ± 4.8 bpm; GEAR = 86.5 ± 5.1 bpm) and post-exercise HR (CONTROL = 161.1 ± 11.9 bpm; GEAR = 179.6 ± 6.8 bpm). Additionally, there were significant differences between CONTROL and GEAR end-exercise Tc (CONTROL = 38.57 ± 0.3°C; GEAR = 39.01 ± 0.3°C), TCS (CONTROL = 3.57 ± 0.6; GEAR = 4.63 ± 0.3), and TS (CONTROL = 7.57 ± 0.5; GEAR = 8.67 ± 0.3). Lastly, there was a 0.04°C/min increase in Tc during GEAR and 0.02°C/min increase in Tc during CONTROL. An analysis of frontal theta EEG power results showed a significant decrease when comparing pre- and post-exercise values during a Go/No-go test in GEAR ( $F_{(1,14)} = 6.069$ ,  $p = 0.027$ ). There was also a significant difference when evaluating incorrect responses between pre- and post-exercise values in GEAR ( $F_{(1,14)} = 5.515$ ,  $p = 0.026$ ). These differences were not observed during CONTROL. **CONCLUSION:** These data suggest that a long duration incremental exercise test while wearing PPE in the heat results in decreased cognitive control. This could have implications for individuals in occupations that wear PPE and need to make critical decisions while experiencing rapid and uncompensable Tc heat storage.

### **Solutions Through Women's Empowerment: Why Health and Education Matter to Climate Change.** Hannah Evans, Senior Analyst at Population Connection

Worldwide, population pressures contribute to immediate dangers like food insecurity, natural resource scarcity, inequality, and climate-changing emissions. Yet, the relationship between population and the environment is complex. Although the carbon footprints of most of the world's population are negligible relative to that of the average American or European, low and middle-income populations are disproportionately vulnerable to climate impacts like rising sea-levels and extreme weather events. Additionally, high fertility throughout low-income regions worsens climate vulnerability and puts more people at risk of experiencing climate impacts who lack the resources necessary to readily respond or recover. This presentation uses a climate justice framework to explore the ways in which demographic trends impact and are impacted by climate change. It argues that expanding human rights and gender equality are necessary interventions for solving climate change. The lecture will conclude with a discussion on the ways in which expanding access to health care and education—especially for women and girls—act as necessary building blocks for climate adaptation, mitigation, and resilience across the globe.

## Environmental Education Session

### **Defining the Natural State Using STEAM: Fundamentalism, Sustainability and Change.**

Kimberly D. Reiter, Stetson University, DeLand FL , Michael A. Reiter, Bethune-Cookman University, Daytona Beach, FL

In recent years, there have been several proposals to broaden the core science curriculum known as STEM (Science, Technology, Engineering, Mathematics) to incorporate perspectives from the Arts into a STEAM curriculum. Despite some creative approaches, the task has proven daunting because of the very real methodological differences, learning outcomes, and knowledge gaps between STEM disciplines and traditional humanities pedagogy, even in a relatively broad scientific field such as Environmental Science or a similarly broad social field such as History. Some relatively recent developments in sustainability pedagogy from the Sustainable Human and Environmental Systems (SHES) Roundtable may provide a way through this conundrum using their pedagogical approach that relies on systemic resolution and systemic synthesis, active social learning, forecasting and backcasting, robust framing, and design studio approaches to explore issues of sustainability without the need to resort to individual disciplinary perspectives. In course trials, we realized that the SHE'S pedagogy could be used to explore any complex topic amenable to a systems viewpoint, including (because of the de-emphasis of unidisciplinary perspectives) STEAM treatments. We will present this approach using a case study involving the development and offering of a demonstration course developed for a National Endowment for the Humanities Enduring Questions Grant (AQ-228796-15). The course, using SHES principles to drive a STEAM approach with supradisciplinary course objectives, gives an historical grounding to twenty first century sustainability issues using, as the overall theme, the question “What is the Natural State?”. The course addresses simultaneously, a) how we determine anything to be “natural,” b) the desire to promote environmental sustainability, and c) the inclination towards fundamentalism and nostalgia. The content was organized using a “telescope” approach to the question, focusing on the very large and cosmologically remote (e.g. Big Bangs or Steady States; How Did It All Begin), and gradually contracting the lens toward current environmental dilemmas and modern human biology, health, society and culture (e.g. Fundamentalism, Change, and Sustainability in the Twenty-First Century), integrating methodologies and approaches from across the academic spectrum using systemic resolution and synthesis to identify the important components and outcomes of any one system and scale. The focus on scale and systemic architecture allowed us to incorporate disciplinary information while downplaying discipline-bound limitations. The SHES pedagogy appears very adaptable to STEAM courses and topics, possibly limited only by the abilities and interests of the faculty and students.

**Footprint App.** Kelly Poirier, CEO of Footprint App Inc.

Footprint App, Inc. is an official public benefit corporation, meaning that we are a for-profit corporation formed to benefit society. Our company is committed to addressing climate change across the world through leading social responsibility, harnessing community action, and empowering people with the resources to make lasting change in their own communities. From educators to business leaders, Footprint helps you realize your path to sustainability.

**Future Focus Films.** Jeremy Robson, Producer of Future Focus Films.

Future Focus Films is where filmmaking empowers society, and where filmmaking meets innovation. I believe that the main way we can improve our society, and our environment, is by creating creativity! In order to communicate our most prevalent issues, and their most innovative solutions, we must engage and captivate our audiences through film. Through filmmaking, we want to highlight impactful global innovations, and show our audience the beauty of this planet, and its constant state of change. Humanity doesn't have to be a burden on the environment, in fact, it can co-exist sustainably, and that is why it is crucial to communicate this. At Future Focus Films, we work with some of the world leading startups, NGO's, companies, social movements, government organizations, and agencies to provide film production services on innovation and sustainability, with a focus on the future.

## **Habitat Loss and Degradation Session**

**Antimicrobial Properties of *Salvinia molesta* on Common Bacteria.** Beverly Burden, Wendy Sanson Dobbins Fields, Amy Erickson, Louisiana State University Shreveport, Dpt. of Biological Sciences.

Very little has been documented about the positive characteristics of the invasive fern *Salvinia molesta*. The goal of this research was to determine if an extract created from mature *S. molesta* plants has antibacterial properties. Extract was tested on the following bacterial species: *Escherichia coli*, *Salmonella typhimurium*, *Staphylococcus epidermidis*, *Bacillus megaterium*, *Enterobacteria cloacae*, *Serratia marcescens*, *Proteus vulgaris*, and *Pseudomonas aeruginosa*. Each species was exposed to small doses of *S. molesta* extract, and absorbance was measured after exposure, which can be interpreted as population density. *B. megaterium*, *P. vulgaris*, *E. coli*, *E. cloacae*, and *S. epidermidis* all showed significant inhibition after being exposed to the extract. For *E. coli*, the response was dose dependent. The Kirby-Bauer test also was conducted on the following bacteria: *E. coli*, *S. typhimurium*, *S. epidermidis*, *B. megaterium*, *S. marcescens*, *Staphylococcus aureus*, *Alcaligenes faecalis*, *P. vulgaris*, *Streptococcus pyogenes*, *P. aeruginosa*, and *Klebsiella pneumoniae*. Small paper discs were saturated with extract and placed on a petri dish that was inoculated with bacteria. Inhibition circles on the paper discs were present for the following bacteria: *E. coli*, *S. typhimurium*, *E. cloacae*, *S. aureus*, *P. aeruginosa*, *S. marcescens*,

*A. faecalis*, and *S. epidermidis*. Some of the inhibition rings were faint but still visible. In conclusion, *S. molesta* extract has the capability of controlling bacterial species. Additional tests should be conducted to determine the extent of inhibition generated by *S. molesta* extract on these common bacterial strains.

**Distribution of carrion-associated beetles and their phoretic mites along an urban rural gradient in northeast Alabama.** Kennedy Norris<sup>1</sup>, Lori Tolley-Jordan<sup>1</sup>, Mark Sciuchetti<sup>2</sup>  
Department of Biology, Jacksonville State University, Jacksonville, AL. Department of Chemistry and Geosciences, Jacksonville State University, Jacksonville, AL.

A projected loss of 40% of the global insect diversity in the next few decades due to habitat conversion and pollution creates a pressing need to document the distribution of ground beetles with low dispersal abilities and small home ranges that have critical roles in carrion decomposition in terrestrial ecosystems. The natural North-South trending rural to urban gradient in a small spatial extent (~ 40 km) with similar geology, precipitation, and soil type in Calhoun County, AL presents a unique opportunity to study the relationship of urban land cover to the distribution of carrion associated with ground beetles. We used Geographic Information Systems (GIS) to determine landscape scale variables in the corridor of % landcover from data provided by National Land Cover Database (2019), patch size (fragmentation) from data provided by the US Census Database, and the percent similarity of land cover types in a patch (habitat heterogeneity) for 11 managed fields (regularly mowed). Microhabitat variables measured at each site included soil temperature, soil composition, and vegetation cover. Beetle and mite diversity was determined by species richness, evenness, and community composition from individuals collected in baited pit-fall traps placed in each of the 11 fields from 11 May 2022 to 11 June 2022. Results from the landscape variable analyses showed that percent urban cover ranged from 4.5% to 96.6%, patch size ranged from 1.1% to 51.2 % and patch heterogeneity ranged from 8.6% (high heterogeneity) to 80% (low heterogeneity) across the 11 sites and results showed that microhabitat variables were similar across all sites. Results of beetle and mite collections yielded a total of 263 beetles in 20 species and 40 mites of one species with similar evenness values across all sites. Results linking beetle diversity to landscape and microhabitat variables were obtained from a principal component analysis where the first two axes explained 77% of the variance of beetle and mite distributions. However, these relationships were not significant based on multiple regression analyses. While these findings suggest that carrion associated ground beetles and their mites are not affected by fragmented habitats, caveats to this study include a limited number of sites, low beetle detection, and low intensity of developed landscape as in a major metropolitan area. Therefore, we recommend this study design is replicated on a larger scale to capture potential urban intensity thresholds that may result in altered beetle communities.

**Louisiana's Worst Invasive Species.** Jackson Wheat, Kyle Barlass, Malek Brown, Katherine Chumley, Cora Hodge, Devon Salvaterra, Amy Anne Erickson. Department of Biological Sciences, Louisiana State University Shreveport.

Invasive species cost the US economy billions of dollars per year by destroying crops, destroying homes, and causing massive ecological damage. In Louisiana specifically, there are several species responsible for economic and ecological damage. Among them, some of the worst invasive species within the state include: feral hogs (*Sus scrofa*), nutria (*Myocastor coypus*), and giant *Salvinia* (*Salvinia molesta*). Feral hogs have resulted from hybridization between the introduced Eurasian wild boar and escaped domestic pigs. Hogs have caused millions of dollars to be lost in the destruction of agriculture, and hog activity has been known to decrease both freshwater insects and mussels. Hog excrement also greatly raises the prevalence of *Escherichia coli* in water bodies, far exceeding federal and state surface water guidelines. Next, nutria are originally native to South America but have been released into North America by the fur trade. Nutria are one of the primary denuders of wetlands, and by consuming large amounts of vegetation, this in turn causes erosion along rivers and streams. Additionally, nutria have been identified as major vectors of disease and have the ability to spread *Toxoplasma gondii*, *Chlamydia psittaci*, *Francisella tularensis*, *Leptospira* serogroups, and the virus responsible for encephalomyocarditis. Lastly, as for *Salvinia*, it was accidentally introduced in the US from Brazil, likely having hitched a ride on the boat of an unsuspecting tourist. Now, *Salvinia* propagates in slow-moving water bodies. It restricts underwater photosynthesis by blocking sunlight, saps dissolved oxygen while decaying, leading to increased amounts of carbon dioxide and hydrogen sulfide, and consumes nutrients far more quickly than most local photosynthetic organisms, reducing biodiversity.

**Preliminary Observations of the Potential Ecological Impacts of the Non-Endemic Cherry Laurel (*Prunus caroliniana*) on Plant Species Diversity in a Tennessee Urban Woodland**

Khanh Ton<sup>1</sup>, Raegan Wilburn<sup>1</sup>, Eric Bridges<sup>2,3</sup>, Ashlee Caruana<sup>1</sup>, Sarah Boyle.

<sup>1</sup> Environmental Sciences and Studies Program, Biology Department, Rhodes College, Memphis TN, <sup>2</sup> Overton Park Conservancy, Memphis TN, <sup>3</sup> Forestry Department, College of Forest Resources, Mississippi State University, Mississippi.

Little research has addressed the impacts of non-endemic plant introduction into urban forest natural areas. Because of their non-invasive status, non-endemic plants are often overlooked and yet, they have the potential to have similar ecological impacts as non-native, invasive species. The vulnerability of urban forests to plant invasion, as a result of their proximity to urban landscapes, habitat fragmentation, and biodiversity declines, makes understanding the mechanisms by which non-endemic plants are established and how they affect urban forest ecosystem structure and function important for future conservation and management efforts. Our study addresses the potential ecological impacts of cherry laurel (*Prunus caroliniana*) on plant species diversity in a 51-ha urban woodland, the Old Forest State

## IICE Program

Natural Area, in Memphis, Tennessee. Cherry laurel is a small, evergreen tree species native to the southeastern United States, but non-endemic to West Tennessee, the location of our study. Introduced for ornamental purposes, cherry laurel naturalized into surrounding forests and eventually became a dominant species with seemingly resistance to herbivory and diseases. To date, no known study has assessed its influences on the existing biodiversity of invaded habitats. The study site has 350 documented vascular plant species. Native tree species include red maple (*Acer rubrum*), pawpaw (*Asimina triloba*), white ash (*Fraxinus americana*), tulip poplar (*Liriodendron tulipifera*), and northern red oak (*Quercus rubra*) - some of which are up to 185 years old. During an inventory in 1987, there was no report of cherry laurel in the forest. At present, however, cherry laurel is the second-most abundant tree species, only behind pawpaw. Our objective was to examine cherry laurel's zone of influence on plant species diversity and compare it to the zone of influence of the endemic pawpaw. We hypothesized that there is a difference in plant species diversity in the zones of influence of the cherry laurel and pawpaw. We recorded understory and overstory species within 1 m<sup>2</sup> and 5 m<sup>2</sup> around the trees, respectively. We noted stem count and percent coverage of each understory species, along with distance and diameter at breast height for overstory species. We collected data from 58 paired plots (five times total) during the summer and fall of 2021 and 2022. Our preliminary findings suggest no differences in the zones of influence between the two species. This study is ongoing, and we continue to collect and analyze data to determine if this pattern persists.

**The PFAS Crisis: "Forever Chemicals" in Our Water.** Brian Salvatore Ph.D. Louisiana State University, Shreveport.

This talk addresses our current understanding of the environmental and human health risks of poly- and perfluoro alkyl substances (PFAS). Termed "forever chemicals", these organic compounds are seemingly everywhere now, having bioaccumulated in virtually every living creature on the planet. Research links PFAS to a variety of health problems, including kidney and testicular cancer, liver and thyroid disease, cardiovascular disease, immune disorders, and reproductive issues including the increased risk of birth defects. Remediation efforts are challenging but possible with the proper steps and focus on keeping more of these chemicals from entering the environment.

## Sustainability and Stewardship Session

**Co-constructing a platform for impact analysis and reflexivity of sustainability projects in Mexico.** Paola M. García-Meneses, Lakshmi Charli-Joseph, Fidel Serrano Candela, Rodrigo García Herrera, Universidad Nacional Autónoma de México, UNAM.

Research impact is not, or should not be, limited to classical metrics such as number, journal, citation indexing, funding granted, but also to the usefulness per se of the information,

knowledge and impact generated (Goring et al., 2014). The aforementioned conventional metrics of academic relevance still carry great weight. However, in sustainability science projects where collaboration and co-production transcend academia, the incorporation of other relevant variables that measure social and not only academic impact is encouraged (Ely & Oxley, n.d.). Changes that potentially lead to impacts of the intervention begin from the creation of the intervention, and selection of the project leader to the formation of teams, which generates internal learning and capacity building. This process can be further monitored, and even intervened, to generate more targeted products and capacities for the benefit of all participants and beneficiaries, while taking into account that the formation of transdisciplinary teams leads to a process that depends on the generation of a learning community in which different ethical-affective sensitivities, epistemic capacities and political visions interact (Merçon, 2021). Sustainability science research seeks ways to evaluate and provide evidence to support the effectiveness of such research (Hansson and Polk 2018). Bornmann (2013) in his literature review concludes that comparable metrics that can capture social impact do not yet exist and that the case study approach is the most suitable for assessing the complexity of social impact, despite its high cost and lack of equipment. In a recent approach, Belcher et al. (2016) develop Cash et al.'s (2002) conceptualisation of four key aspects of effective sustainability research: relevance, credibility, legitimacy and effectiveness. Belcher et al. consider these four principles as necessary attributes for research to successfully produce useful information that can cross boundaries between disciplines, across scales, and between science and society (Belcher et al. 2016). This would be a way of assessing the research process that could allow building on these approaches to increase understanding of the relationship between the quality of the research process and transdisciplinary approach research and its social effects based on the criteria suggested by Cash (2002). From the above, it might be easy to think that impact is measured at the end of interventions. However, within the implementation processes of an intervention or project, changes may arise that contribute to the impact of the intervention or project (Hansson & Polk, 2018; Herweg & Steiner, 2002; Mâsse et al., 2008; Oberlack et al., 2019; Scarinci et al., 2017; Schneider, Giger, et al., 2019a; Van Noorden, 2015; Vogel, 2012). Therefore, measuring impact at the beginning and during an intervention can help early identification of the trajectory towards goal achievement in a more holistic way (Rau et al., 2018). Throughout this proposal, we have presented some of the challenges facing science today and some of the strategies through transdisciplinary work that more deeply and effectively co-produce responses to coupled social-ecological systems issues. Increasingly, transdisciplinary work is being promoted because it has been identified as having a greater impact (Hensler et al., 2021; Zafra-Calvo et al., 2020) on academic and public policy interventions in sustainability. Yet, there are few studies that provide information on what can be measured within the process, the trajectory of an intervention and the changes that proponents have during these interventions. This abstract is to present a proposal to monitor the early trajectories of interventions considering the socio-political orientations of individuals, creating spaces for reflection using tools such as Theories of Change to identify areas of opportunity to improve the implementation of

transdisciplinary interventions so that they have a greater impact internally and externally to the project.

**Ethics in Agribusiness: Justice and Global Food in Focus.** Shane Epting Ph.D., Missouri University of Science and Technology.

This presentation offers an original perspective on food supply chains. It argues that the ability to trade food on a global scale *could be* intrinsically good aside from any instrumental value that people gain from it. While this argument seems to counter wholesale anti-agribusiness views, it is consistent with the larger goals of food-justice movements. It examines the structures of food supply chains, revealing the kinds of harm they help produce. They include slavery, abusive labor, geopolitical exploitation, ecological degradation, and public health impacts. Although the book argues that food supply chains can be collectively beneficial, eliminating their immoral features must hold steady as a continuous enterprise. Securing this outcome means that we go beyond critique. The final chapter advocates for the sustainable food label to address issues of food justice and food sovereignty.

**Evan's Blue Assay Evaluation of the KED Signaling Pathways Possible Wound Response Function in Tomato Plants.** Annalise Wellman, Alexander Spanoudis, Hailey Wright, Nicholas Nifakos and Dr. Xing-Hai Zhang. Department of Biological Sciences; Charles E. Schmidt College of Science, Florida Atlantic University, Boca Raton, Florida

The KED pathway is a signaling pathway found in tomato plants that currently has no specific known function. Research suggests that the KED pathway may be expressed as a result of plant wounding. Evan's Blue assay is an indicator solution that allows one to gauge wounding in plant tissues: the more blue intensity, the more severe the wounding. Using a prepared Evan's Blue solution would allow one to assess the possible link between the healing of wounded plants and the expression of the KED gene. In this study, the control tomato plants and the KED-knockout tomato plants were both wounded by punching leaf disks out of their leaves. The leaf disks were suspended in an Evan's Blue solution and rotated for 20 minutes. Then, the disks were placed in a 2.5 ml methanol for one day at 25 degrees Celsius to remove excess chlorophyll from the leaf sample, turning the disks white. Evan's blue dye was extracted from decolorized leaf samples, and the dye's concentration was measured. Using this method to track the possible role of KED gene expression in plants' wounding response has the potential to broaden our knowledge of the KED signaling pathway, leading to new studies on how KED is utilized in the wound response of other plant species.

**The Effects of Environmental Organizations on an Individual's Pro-Environmental Behaviors.** Asli Guler, Sociology PhD Student, State University of New York at Buffalo

Despite the importance of environmental organizations for creating awareness of environmental problems, we lack an understanding of the process that leads individuals to engage in behavioral changes and adopt pro-environmental behaviors. Therefore, in this study, the primary question is: How does working for an environmental organization affect an individual's pro-environmental behaviors? To investigate this question, I collect interviews with the members of environmental organizations to understand the process leading to their behavioral changes. Initially using a purposive sampling technique, I have reached out to the individuals in my primary network. After initial interviews, I use a snowball sampling now to increase my sample size. As an analytical technique, I analyze my data based on grounded theory building guidelines and build a theory/model that explains how participation in environmental organizations affects an individual's pro-environmental behaviors. Based on initial interviews with four individuals, I have come up with nine major themes and have created a process model that explains how individuals engage in pro-environmental behaviors. These ten categories based on my data analysis consist of (1) Responsible parties, (2) Triggers, (3) Environmental problems, (4) Individual background, (5) Concern & Worry, (6) Identification with these organizations, (7) Behavioral questioning, and, (8) pro-environmental behaviors. This study draws on the theory of environmentally responsible behaviors. The theory has been chiefly developed on individuals' intentions, locus of control, guilt, and knowledge. In this study, I develop a process model that will contribute to this model. In particular, I expand the theory by investigating the roles of environmental organizations in leading individuals to change their members' existing behaviors and adopt pro-environmental ones. In particular, I investigate the process of how an individual decides to participate in environmental organizations and how their participation yields to pro-environmental behaviors. These findings shed light on the determinants of pro-environmental behaviors and the effectiveness of environmental organizations to change the behaviors of their members.

**Understanding History to Inform Urban Wildlife Governance.** Pooja Kumar, MCIP, RPP, Planner, City of Yellowknife.

Oceanic islands are well-studied in relation to natural processes. Less knowledge has been gathered and compared about nature (and all that it encompasses) on continental islands. This research was carried out with an understanding that, since most islands are continental, it is important to understand how the dynamics of human-made processes can affect nature on continental islands. The location of the work was Prince Edward Island: Canada's smallest, least populated, and most densely populated sub-national jurisdiction. The focus of the work was urban wildlife governance in Charlottetown, the capital of Prince Edward Island. To put the work into perspective, similar but more generalized research was carried out for the mainland sub-national jurisdiction of Colorado and its capital city Denver. This comparative work was included to be able to identify whether the findings of the research had anything to do with "islandness" (Baldacchino, 2018). Islandness has been described as the interplay of geography,

which “tends towards isolation” and history, which “tends towards contact” (Warrington and Milne, 2018, p.175). Islandness is such a broad concept that, logically, it would affect how human practices towards wild nonhumans have been shaped, in urban areas or otherwise. To understand islandness in the context of Prince Edward Island and Charlottetown, the analytic approach of French philosopher Michel Foucault was used. Foucault’s approach was considered most relevant to this research because his consideration of archival information has allowed for a relatively full understanding of institutional and social behaviors at different times in human history. The exploration of two hypotheses and four research questions guided this research process. Five discourses about how humans think about wild non humans emerged through the data: humans have to use wild nonhumans, humans have to get rid of wild nonhumans, humans have to learn about wild nonhumans, humans have to help wild non humans survive, and humans have to behave humanely towards wild nonhumans. These discourses interact in Charlottetown, and on Prince Edward Island, to provide insight into why different publics behave as though they are disenfranchised in relation to wildlife conservation and management. The comparative aspect of the work reveals important similarities and subtle differences about wildlife governance in Charlottetown and Denver. Overall, the research highlights the importance of understanding the public trust doctrine in relation to wild nonhumans and not assuming that public trust managers exist in any institutional setting.

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