

## **ENVIRONMENTAL HEALTH SCIENCES FALL 2019 SEMINAR SERIES**

Wednesday

**SEPT**

**11**

12:00 Noon

Public Health Research Center

Room 107

### **Town Hall Forum:**

**Natural Resources Conservation and Policy; a discussion about the challenges of science and stewardship in the post-modern age**

**Robert H. Boyles, Jr.**

*Interim Director, South Carolina Department of Natural Resources*

Robert H. Boyles, Jr. serves as the chief administrator for natural resources in the State and is responsible for management and supervision of the agency's five-line divisions: Office of Support Services; Land, Water & Conservation; Law Enforcement; Marine Resources; and Wildlife & Freshwater Fisheries, with a staff of over 900 people in numerous locations across South Carolina.

During this seminar Mr. Boyles will invite faculty, staff and students to discuss natural resources conservation and policy and the challenges of science and stewardship in the post-modern age.

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## **ENVIRONMENTAL HEALTH SCIENCES FALL 2019 SEMINAR SERIES**

Wednesday

**SEPT**

**18**

12:00 Noon

Public Health Research Center

Room 107

### **TAKING THE NEXT STEP IN TRANSCRIPTOME DATA ANALYSIS: FROM BULK TO SINGLE CELL**

**Guoshuai Cai**

*Assistant Professor, Department of Environmental Health Sciences*

*Arnold School of Public Health, University of South Carolina*

During this seminar Dr. Cai will discuss how the transcriptome is a key determinant of the phenotype. Understanding of transcriptome is important for understanding the mechanisms of development and disease. Bulk RNA-seq has been widely used to profile transcriptomes in recent years and greatly facilitated the science of human health and biology systems by producing a significant amount of data (81,900 samples in NCBI GEO data repository). However, this method is only capable of measuring average gene expression levels within all collected cells, masking signals from individual cells, obscuring their potential role in disease development. Recently, the powerful technique, single-cell RNA-sequencing (scRNA-seq), has been enabling high-resolution studies of gene expression patterns at the single-cell level. However, scRNA-seq data is complex and noisy and thus tailored analysis methods are demanded. This talk will introduce the opportunities, applications and challenges in those state-of-the-art technologies and discuss our efforts to facilitate the transcriptome research to the next level. At the end of this talk attendees

will have a better appreciation of high dimensional RNA sequencing data analysis and will meet a new useful product of ENHS Bioinformatics and System Biology Lab.

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## **ENVIRONMENTAL HEALTH SCIENCES FALL 2019 SEMINAR SERIES**

Wednesday

**SEPT**

**25**

12:00 Noon

Public Health Research Center

Room 107

### **MULTI-STRESSOR EFFECTS OF ULTRAVIOLET LIGHT, TEMPERATURE, AND SALINITY ON OIL TOXICITY IN ESTUARINE SPECIES**

**Marie E. DeLorenzo, Ph.D.**

*Branch Chief, Ecotoxicology Branch, Stressor Detection and Impacts Division, National Centers for Coastal Ocean Science, NOAA National Ocean Service*

During this seminar Dr. DeLorenzo will discuss the cumulative and interactive stressors of chemical contaminants and environmental factors are especially relevant in estuaries where tidal fluctuations cause wide variability in salinity and temperature. Changes in depth also affect ultraviolet (UV) light penetration, which is an important modifying factor for polycyclic aromatic hydrocarbon (PAH) toxicity. The introduction of oil into estuarine systems may have different levels of effect depending on the tidal stage and time of year. Characterizing the interactions of multiple stressors on oil toxicity will improve prediction of environmental impacts under various spill scenarios. This study examined how toxicity of unweathered Louisiana Sweet Crude (LSC) oil was altered by temperature, salinity, and UV light. Experiments included acute exposures with dissolved oil fractions and thin oil sheens. Several estuarine species representing different trophic levels and habitats were evaluated, including the sheepshead minnow, *Cyprinodon variegatus*, the grass shrimp, *Palaemonetes pugio*, and the mud snail, *Tritia obsoleta*. These species are capable of surviving a wide range of environmental conditions; however, they were more sensitive to oil exposure when combined with abiotic stressors. UV light increased the toxicity of LSC oil in all species tested. LSC oil toxicity was also greater under elevated temperature conditions. Effects of salinity on LSC oil toxicity varied among species tested. Complex interactions occurred when more than one abiotic stressor (e.g. UV light and increased temperature) were combined with LSC oil.

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## **ENVIRONMENTAL HEALTH SCIENCES FALL 2019 SEMINAR SERIES**

Wednesday

**OCT**

**2**

12:00 Noon

Public Health Research Center

Room 107

### **DETECTION AND FORECASTING OF THE OUTBREAK AND SPREAD OF SEVERAL INSECT VECTOR BORNE INFECTIOUS DISEASES AFFECTING HUMAN HEALTH**

**Leonard J. Pietrafesa, PhD**

Professor Emeritus, North Carolina State University and Burroughs & Chapin Scholar, Coastal Carolina University

During this seminar Dr. Pietrafesa will discuss how electronic health data offers opportunities for analysis leading to the creation and production of disease signature libraries for purposes of epidemiological retrospective hind-casting and prognostic forecasting. Diagnosing disease signature patterns offers the potential for proactive health intervention. It offers the prospect of enhancing recognition of unusual, non-routine disease activity. Hind-casting and forecasting disease signature patterns to enhance pre-emptive warning are crucial components of epidemiological watches and warnings. To accomplish this, data-bases necessary for exploitation must be identified and harvested, including weather and climate data. Truly unique about the prospectus is accurate epidemic morphology.

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**ENVIRONMENTAL HEALTH SCIENCES FALL 2019 SEMINAR SERIES**

Wednesday

**OCT**

**23**

12:00 Noon

Public Health Research Center

Room 107

**ENVIRONMENTAL DISASTERS, STRESS, AND A COMMUNITY HEALTH OBSERVING SYSTEM**

**Paul A. Sandifer, Ph.D.**

*Director, Center for Coastal Environmental and Human Health; Deputy Director and Co-PI, University of South Carolina Center for Oceans and Human Health; Affiliate Scientist, Gulf of Mexico Research Initiative; Editor, AGU journal GeoHealth; College of Charleston, School of Sciences & Mathematics, Hollings Marine Laboratory*

During this seminar Dr. Sandifer will describe Environmental disasters are a distressingly frequent fact of modern life. In the US, few regions have had a longer or more troubled history of environmental disasters than the Gulf of Mexico which has been plagued by named events that conjure up images of devastation and human suffering such as Katrina, Deepwater Horizon, Harvey, Michael, and others. While much attention is focused on near-term effects to infrastructure and the environment, long-term human health effects generally receive less consideration. This is in part because these effects are numerous and varied, they are harder to identify since most areas lack robust baselines of human health information against which to compare post-disaster data, and because they may take a long time to become fully evident and thus to treat. This seminar will include recent disaster history and typology, an introduction to disaster-associated human health effects, in particular those related to cumulative stress, and ongoing work to develop a framework for a Community Health Observing System for the Gulf region to provide a continuous baseline of human health data.

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**ENVIRONMENTAL HEALTH SCIENCES FALL 2019 SEMINAR SERIES**

Wednesday

**Nov**

**20**

12:00 Noon

Public Health Research Center

Room 107

# **FATE AND EFFECTS OF TIRE PARTICLES AND OTHER MICROPLASTICS IN COASTAL WATERWAYS**

## **John E. Weinstein Ph.D.**

*Chair of the Biology Department and Associate Dean of Accreditation for the Swain Family School of Science and Mathematics*

Dr. John Weinstein is a Professor and Chair of the Biology Department at The Citadel. He earned a B.A. in Biology from Rutgers University, an M.S. in Biology from East Carolina University, and a Ph.D. in Biological Sciences from the University of South Carolina, and he has been at The Citadel for the past 20 years. His research expertise is in the area of environmental toxicology with a focus on natural and anthropogenic stressor interactions in salt marsh habitats, food web transfer of persistent organic pollutants, and risk assessment. Currently, the focus of his research is on the sources, fate, and effects of plastic and microplastic pollution in Charleston Harbor.

## **Sarah Kell**

*Graduate Student, College of Charleston and Research Assistant, Citadel*

Sarah Kell is a candidate for a M.S. degree in Marine Biology at the College of Charleston, SC and plans to graduate in Spring 2020. She obtained her B.S. in Marine Biology at the University of West Florida where she conducted Florida apple snail demographic research and investigated juvenile snail predator-prey interactions. Subsequent work at the U.S. EPA, included investigating the effects of multiple stressors (temperature, UV radiation, and sedimentation) on Atlantic and Pacific scleractinian corals. Sarah later worked for the Florida Department of Environmental Protection as an Environmental Specialist in the Environmental Resources Program and the Office of Emergency Response. She also served as the State Liaison at the Florida Branch Office for 3+ years during the Deepwater Horizon Oil Spill Response. Her current research interests include assessing the environmental and toxicological impacts of microplastics in the marine environment. Post-graduation she plans to work for an NGO or the government on issues like marine pollution and debris.

During this seminar Dr. Weinstein and his Graduate Student Sarah Kell will describe how studies conducted within the Charleston Harbor, SC watershed have revealed that >90% of total microplastics in sediments at some locations are tire particles (TP) but little is known about the way by which they enter coastal waters and their potential effects on estuarine biota.

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