



UNIVERSITY OF
SOUTH CAROLINA
Arnold School of Public Health

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Photos available upon request

Oceans, human health; climate change focus of unique new \$5.7 million alliance *NIEHS-funded university collaboration aimed at discovering impacts to drive prevention*

(COLUMBIA, South Carolina) – The first multi-academic institution center in South Carolina to study the effects of ocean health-related illness and the interactions from climate change is initializing its operations. Funded by a \$5.7 million grant from the [National Institute of Environmental Health Sciences \(NIEHS\)](#), more than 20 researchers from five colleges and universities are beginning their work aimed at better protecting human health through the new [Center for Oceans and Human Health and Climate Change Interactions](#).

The University of South Carolina, College of Charleston, The Citadel, Baylor University, and the University of Maryland Center for Environmental Science were awarded the NIEHS grant in the fall of 2018 for the center that is headquartered at the University of South Carolina's (UofSC) [Arnold School of Public Health](#), in Columbia. The Center will be led by Geoffrey I. Scott, clinical professor and chair in the UofSC [Department of Environmental Health Sciences](#). The Center's deputy director is Paul A. Sandifer, director of the [Center for Coastal Environmental and Human Health at the College of Charleston](#). Scott and Sandifer will work with a team of scientists who are faculty leaders at all five institutions. Additionally, researchers and environmental public health practitioners from the [National Oceanic and Atmospheric Administration](#), the U.S. Geological Survey, the Interstate Shellfish Sanitation Conference, and the Lowcountry Alliance for Model Communities will participate.

Working against time for everyone

The intersection of climate change and urbanization is nowhere more apparent than in the coastal zone, as increasing global temperatures, sea level rise, and coastal flooding meet growing population centers and economic hubs in coastal communities in South Carolina, the United States and the world.

Common coastal ecosystem problems include:

- Increased frequencies and severities of harmful algal blooms, water-based plants that can grow out of control and produce potent toxins that can impact human and animal health;
- Antibiotic resistance in disease-causing microbes such as Vibrio bacteria, that live in coastal waters and can cause harmful infections through the consumption of raw/undercooked shellfish and wound infections;

- Contaminants of emerging concern such as microplastics in coastal waters resulting from trash and tire decomposition;
- Pharmaceutical and personal care product contamination from discharges into sewer systems including byproducts of human use, metabolism and disposal of expired medicines.

The Center's main purpose will be to assess the effects of illness and disease related to ocean health, to then use the information to develop forecasts that prevent human exposure to these stressors, and other prevention strategies. In particular, the scientists aim to look at climate change-related factors that may enhance the presence of disease-causing *Vibrio* bacteria and harmful algal blooms, and their production of toxins that are harmful to fish, marine mammals and humans.

"Elevated levels of dangerous *Vibrio* bacteria and harmful algal blooms toxins can adversely affect human health by increasing human exposure in drinking water, seafood and in surface waters used for recreation," said Scott. "By establishing predictive water quality and environmental variables, we can develop models and early warning forecasts to alert the public, prevent exposure and thus better protect ecosystem and human health."

The Center's scientists at work

The OHHC² scientists will work on different portions of the research simultaneously to maximize the results more efficiently. The UofSC team will assess impacts of increased exposure to climate stressors (rising temperatures and changing salinities) on associated diseases and illness, such as *Vibrio* bacteria in seafood and wound infections, and on harmful algal bloom toxin effects non-alcoholic fatty liver disease. These analyses will indicate the extent and magnitude that climate change may have on these illnesses under future climate scenarios. This will be used to better identify vulnerable populations and help tailor community-engagement activities for these susceptible communities.

"With more than 50 percent of the southeastern U.S. population now living within 50 miles of the seashore, we are long overdue to have this kind of public health research center available to the citizens of South Carolina and beyond," said [Thomas Chandler](#), dean of the Arnold School of Public Health at UofSC. "Drs. Scott and Sandifer have assembled an accomplished scientific team that is nationally recognized for their expertise in the difficult environmental health issues linked to rapid population growth on our coasts – things like mitigation of harmful algal blooms, non-point source pollution prevention, and identification of most-vulnerable citizen populations."

Co-investigators at UofSC include Sean Norman, Alan Decho, Jamie Lead, Saurabh Chatterjee, Shuo Xiao, Dwayne Porter (UofSC Environmental Health Sciences), Bo Cai (UofSC Epidemiology and Biostatistics), Daniela Friedman (UofSC Health Promotion, Education, and Behavior), and John Ferry, Tim Shaw, Susan Richardson (UofSC Chemistry). Drs. Bryan Brooks, Thad Scott, and Scott James of Baylor University will lead the research on Harmful Algal Blooms. Dr. John Weinstein of the Department of Biology at the Citadel will lead the research on the environmental health effects of microplastics. Dr. Heath Kelsey of the University of Maryland Center for Environmental Science will be part of the Center focused on community engagement, facilitating communication amongst the researchers and communities.

The Center is engaging in field and laboratory projects in South Carolina and Texas and will lead related community engagement through a variety of venues. For more information, please see [Center website](#) at the [Arnold School of Public Health website](#) or contact the Center's Office at 803-777-8940.

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