

NEW HIGHS for LOW TIDES: Ideas to Meet the Challenges of RISING WATERS

The University of North Carolina Spring 2017 Research Symposium



May 1, 2017, Global Education Center 4003 Organized by Professor Rachel A. Willis American Studies & Economics, UNC-CH

Session 1: Fortifying with Innovation: Applying Synergistic Surface Technologies to Combat Rising Waters

Meghan Kage: When It Rains, It Pours: Stormwater Management Planning for Urbanizing Townships

Banks Ferrell: Raising the Economy with Bacteria: Innovative Resources Needed to Adapt Seaports

Session 2: Where the Rudder Meets the Road

Molly Gilchrest: <u>Too Big for their Beaches</u>: Planning for Sea Level Rise in South Florida and the Everglades Watershed

Julia Ashley: Trump's Administration Plans Regarding the Sea Grant Program

Christopher Garcia: Cycling Toward the Future: Bicycle Infrastructure Adaptation Planning for Rising Waters

Session 3: Wilson! Geographical Risk Assessment of Island Communities

Rachel Woodul: "Mom, Is This Water Sanitary?"- Rising Waters and Rising Rates of Infectious Disease

Jordan Clark: Assessing the Vulnerability of Shorelines using GIS and Remote Sensing in Culebra, Puerto Rico

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Ashley, Julia (Journalism, 2019)

Trump's Administration Plans Regarding the Sea Grant Program

President Donald Trump's Plans to cut the federal funding for NOAA's Sea Grant Program, created in 1966, has raised great concern over the ability of the US to face community water challenges at the coast. The Sea Grant Program is devoted to education regarding sea-level rise, ocean acidification, and the effect of melting glaciers on kelp beds. The Sea Grant funds support over 3,000 scientists, pays for coastal research through 33 university programs, pay for projects that promote fishers to adopt sustainable practices, and it has improved water quality in the Chesapeake Bay. Issues regarding the impact of lost funding on the Sea Grant Program will be discussed.

Clark, Jordan (Geography, 2017)

Assessing the Vulnerability of Shorelines using GIS and Remote Sensing in Culebra, Puerto Rico

Culebra is a small island off the coast of Puerto Rico where rising sea levels have already lead to extreme beach erosion and warmer ocean temperatures have led to the loss of coral reefs, threatening the economic jewels of Culebra, the white sand beaches. Determining the varying levels of susceptibility of shorelines is important in identifying the appropriate adaptive and mitigative responses both spatially and temporally. This presentation will display the integral role of GIS and remote sensing in studying the susceptibility of coastlines to rising seas in order to better allocate resources to shore up barriers against evermore turbulent seas.

Ferrell, Banks (Economics, 2017) Raising the Economy with Bacteria: Innovative Resources Needed to Adapt Seaports

\$3.8 billion dollars of goods travel through American seaports everyday. With long design lives, port infrastructure conceived today will last centuries. It will cost \$62 billion to elevate commercial coastal ports by just 1 meter and require 495m³ million of concrete fill. With concrete production accounting for over 5% of CO2 emissions, the implementation of bio-concrete and carbon-negative concrete into port infrastructure will keep the economy moving. It is from the research of Henk Jonkers that this presentation seeks to analyze technologies that will reduce the carbon footprint, fortify, and adapt US seaports to the rising tides of climate change.

Garcia, Christopher (American Studies, 2018) Cycling Toward the Future: Bicycle Infrastructure Adaptation Planning for Rising Waters

As climate change continues to cause more frequent extreme weather events and rising waters, coastal areas are directly affected and need to develop informed adaptation plans, including transportation infrastructure. Because of the large automotive industry in North America, bicycles are often ignored or trivialized as a mode of transportation. This session will explore the impact of existing bicycle infrastructure in coastal areas and areas at risk for rising waters, as well as the efficacy of these infrastructure plans.

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(Garcia, Christopher - continued)

It will also explore how marketing and promotion of bicycle infrastructure in coastal tourism can act as a boon for coastal economies.

Gilchrest, Molly (Environmental Studies, 2019) Too Big for their Beaches: Planning for Sea Level Rise in South Florida and the Everglades Watershed

The Everglades, a vast watershed encompassing most of central and southern Florida, has been drained to accommodate for urbanization. Canals were dug throughout the state to control flooding. As the negative consequences of our flood control methods were realized, plans such as the Comprehensive Everglades Restoration Project have been put in motion to try and restore the historic flow of the Everglades watershed. However, the changing climate and rising sea levels present new problems not originally accounted for in these plans. As climate change accelerates, Florida should look to the Netherlands as a model for how to sustainably control flooding.

Kage, Meghan (Environmental Studies, 2017) When It Rains, It Pours: Stormwater Management Planning for Urbanizing Townships

This project focuses on evaluating planning processes and stormwater management for urban development. It assesses the stormwater management system already implemented by the town of Chapel Hill and demonstrates how even a well-funded, wellresearched program may overlook effects from watershed evolution. The long-term impact of water flow on the property value of a development showcases the need for a planning process with consideration for increasing impermeable surface areas on and near the property. This case study will demonstrate that rising waters are not just an issue for coastal communities, but affect towns not normally considered to be vulnerable.

Woodul, Rachel (Geography, 2018)

"Mom, Is This Water Sanitary?"- Rising Waters and Rising Rates of Infectious Disease

One of the most dangerous consequences of global climate change is the one we can't see. As waters rise, there is potential for an increase in both waterborne and vectorborne diseases. This threat is not always visible and it is almost impossible to tell where a new outbreak may originate. By combining remote sensing of the environment, GIS, and models of disease transmission and population susceptibility, I will present innovative methods for assessing health risk in vulnerable geographies and identifying areas of greatest threat. Identifying high-risk geographies and potential channels for disease transmission is an essential first step to prevent new epidemics in an uncertain future.

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