

Repeated hurricanes reveal risks and opportunities for social-ecological resilience to flooding and water quality problems

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About the talk:

Hurricanes that damage lives and property can also impact pollutant sources and trigger poor water quality. North Carolina has experienced 4 "500-yr" storms within 3 years. Under these conditions, wastewater treatment plants and sanitary sewer overflows can occur far inland, as well as coal ash spills, breaches of coned animal feeding operation waste lagoons, and fish kills; yet, in-situ sensors can go offline and hazardous conditions preclude field sampling needed to monitor surface waters. Publicly available satellite data enables delineation of flooding over broad areas, which can aid in quantifying the extent of flood exposure and potential water quality impacts. In our recent study, we used satellite-based radar to map flooding from Hurricanes Matthew (2016) and Florence (2018), examined risks to water quality, and identified opportunities to improve resilience in light of social, ecological, and infrastructure vulnerabilities. Our results suggest that current hazard mapping is inadequate for resilience planning; increased storm frequency and intensity necessitate modification of design standards, land-use policies, and infrastructure operation. Implementation of interventions can be guided by a greater understanding of social-ecological vulnerabilities within hazard and exposure areas. Our methods can support future disaster response and recovery efforts, as well as long-range planning to improve resilience in flood-prone regions.

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About the speaker: Danica Schaffer-Smith, The Nature Conservancy



Danica is a NatureNet Science Fellow at Arizona State University's Center for Biodiversity Outcomes and The Nature Conservancy. She completed her Ph.D. in Environmental Science and Policy at Duke University. Danica uses remote sensing and modeling to support locally appropriate conservation and management decisions. Her previous research has spanned a variety of topics, including modeling wind-driven fire spread, assessing habitat connectivity for endangered species, analyzing global tropical deforestation, and quantifying linkages between coupled social-ecological systems. In her postdoctoral work, Danica is investigating solutions for water quality and flooding problems in agricultural and urbanizing watersheds under increasingly extreme droughts and hurricanes.