



Civil and Environmental Engineering Department Seminar

Hurricane Hazards and Risk in a Changing Climate

Ning Lin, Ph.D.

Department of Civil and Environmental Engineering, Princeton University

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Join Zoom Meeting

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Meeting ID: 925 0263 5986 Passcode: 151477

Abstract

Hurricanes, with their strong winds, heavy rainfall, and storm surges, cause much damage and loss of life worldwide. The impacts of these storms may worsen in the coming decades because of rapid coastal development coupled with sea-level rise and possibly increasing hurricane activity due to climate change. Here we present a holistic framework of modeling hurricane hazards and risk in a changing climate. First, we introduce a new probabilistic hurricane model that can be used to generate large numbers of synthetic storms with physically correlated characteristics under projected climate conditions. Second, we discuss about hurricane wind, rainfall, and surge hazard modeling and the coupling with the hurricane model to estimate individual and compound hazard probabilities in a changing climate. Third, we discuss about the modeling of hurricane vulnerability of coastal communities and infrastructure systems. Then, we discuss about the development of hurricane risk mitigation strategies, concerning the existence of deep uncertainties in climate science and the benefit of continuous learning and updating.

Bio sketch



Ning Lin is an Associate Professor of Civil and Environmental Engineering at Princeton University. Lin's research areas include natural hazards and risk analysis, climate change impact and adaptation, wind engineering, and coastal engineering. Her current primary focus is hurricane risk analysis. She integrates science, engineering, and policy to study hurricane-related weather extremes (strong winds, heavy rainfall, and storm surges), how they change with changing climate, and how their impact on society can be better mitigated. She has published in high-impact journals including Science, Nature Climate Change, and PNAS on these topics. Lin is a recipient of CAREER award from National Science Foundation and Natural Hazards Early Career Award and Global Environmental Change Early Career Award from American Geophysical Union (AGU). Lin received her Ph.D. in Civil and Environmental Engineering from Princeton University in 2010. She also received a certificate in Science, Technology and Environmental Policy in 2010 from Princeton. Before rejoining Princeton as an assistant professor in 2012, she conducted research in the Department of Earth, Atmospheric and Planetary Sciences at MIT as a NOAA Climate and Global Change Postdoctoral Fellow.