Exploring the impact of forecasts on evacuations using agent-based models
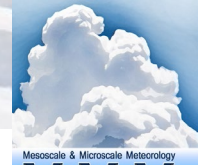
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In addition to measuring forecast skill in terms of errors in a hurricane's track and other meteorological characteristics, there's a need to more directly measure the impact of these forecast errors on societal outcomes. With this in mind, an agent-based modeling framework has been developed to explore the relationships between forecast errors, evacuation decision-making, and traffic. Called FLEE (Forecasting Laboratory for Exploring the Evacuation-system), the framework integrates several empirically-informed models of the natural hazard (hurricane), the human system (information flow, evacuation decisions), the built environment (road infrastructure), and connections between systems (forecasts and warning information, traffic, impact zones).

This presentation will describe the modeling framework and compare its simulated evacuations with empirical data on evacuation rates and traffic. We then explore how FLEE's evacuations change with different hurricane scenarios, amounts of forecast errors, and other changes in evacuation demand, evacuation management strategies, and population characteristics. In doing so, the idea is to demonstrate how agent-based models like FLEE can bridge the physical-social-computational sciences to study the hurricane forecast-evacuation system from a new perspective. This includes eventually providing a societally-relevant alternative to traditional metrics of forecast accuracy, and I will outline some next steps attempting to explore this possibility.

Thursday, 12 October 2023, 2:00pm

Refreshments 1:45pm
Please also join colleagues for refreshments and informal discussion after the seminar until 3:30pm

NCAR-Foothills Laboratory, 3450 Mitchell Lane
FL2-1022, Large Auditorium

Seminar will also be live webcast
https://operations.ucar.edu/live-mmm
Participants may ask questions during the seminar via Slido.

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