

Assessing and Modeling the Compound Hazard of Freezing Rain and Wind Gusts

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Storyline Overview

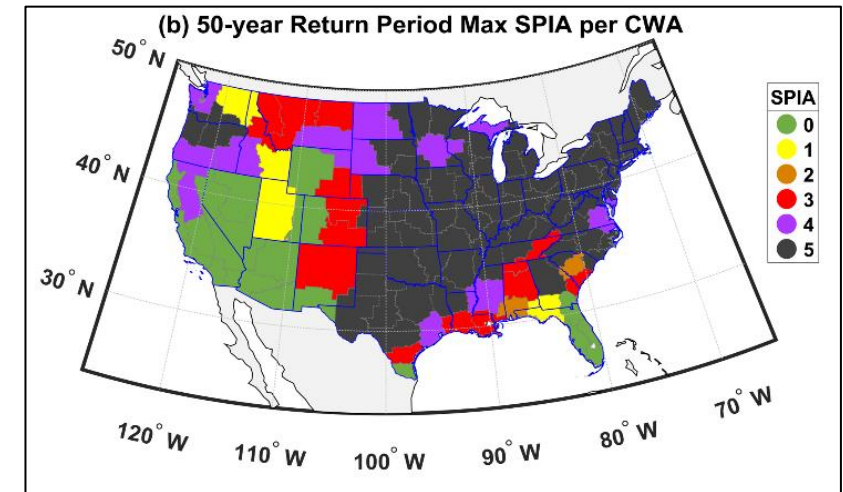
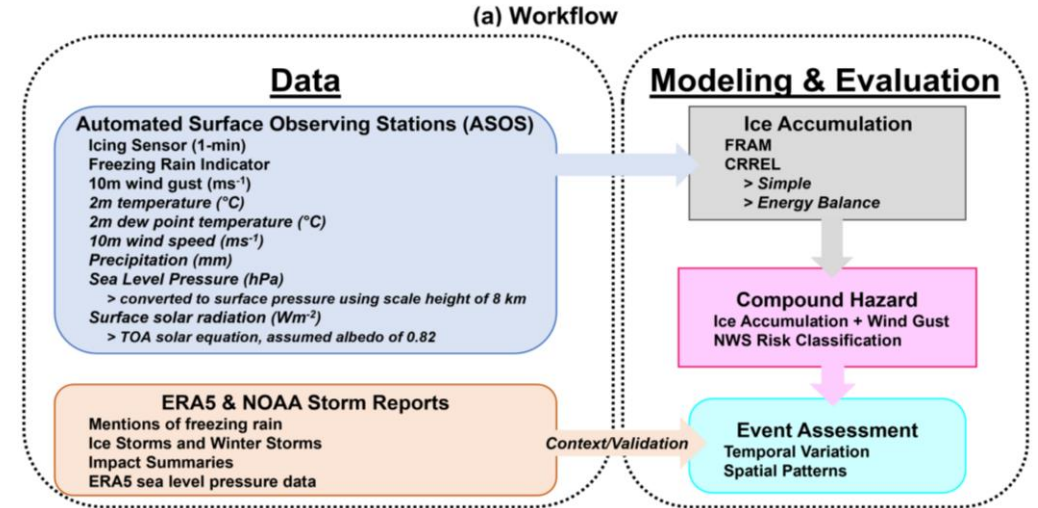
Co-occurrence of freezing rain, ice accumulation + wind gusts (FZG) = significant hazard but quantification challenged by lack of ice accumulation measurements.

Methodology

Ice accumulation modeled at 883 ASOS stations (2005-2022). Geospatial atlas of Sperry–Piltz Ice Accumulation Index (SPIA) & 50 yr return period event intensities produced.

Insights Gained

- 1-3 FZG events yr⁻¹ occur in an arc from Texas over the Midwest into the Northeast
- 50 yr Return Period values with maximum ice thickness of 3–5 cm and wind gusts > 30 ms⁻¹ (i.e. SPIA = 5) over much of eastern USA
- Storylines of FZG identified. Met context: along frontal boundaries of transient midlatitude cyclones or amplification of Rossby waves and associated cold air outbreaks



Workflow and 50-yr RP SPIA by County Warning Area. From: Coburn, Barthelmie & Pryor 2024 Environ. Res. Lett. 19 044016