Projecting changes in societally impactful northeastern U.S. snowstorms

Scientific Achievement

- Annual average snowfall projected to decrease across the northeastern United States by the end of the century
- This decrease is primarily constrained to "weak" or "nuisance" snowfall events
- Large, crippling storms with heavy snowfall over major population centers are unlikely to be mitigated in the future, even with warmer winters

Significance and Impact

- Novel metric defined that quantities individual coastal snowstorms within large weather and climate datasets
- Storm-level analysis important for stakeholders and other end users since rare and extreme events produce the largest societal, economic, and hydrological impacts

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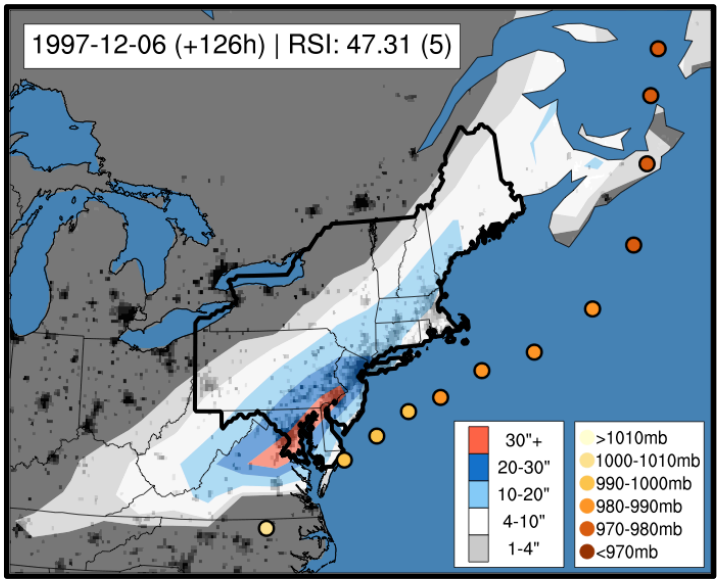
Research Details

- Automated algorithm to objectively track coastal extratropical storms developed, applied to Community Earth System Model (CESM) Large Ensemble
- Data indicates non-linear decreases in snowstorms as a function of societal impact throughout the next century
- Storm-level analysis shows coastal cyclones will be more moist in the future, so even with shorter, warmer winters, when temperatures can support snow, future storms will still possess high snowfall rates and total accumulations



Example of an "extreme" Category 5 snowstorm detected and tracked in CESM. Colored circles indicate storm center path and intensity, color contours are accumulated snowfall, and greyscale underlay shows population density.

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