

Characteristics of Extreme Daily Snowfall Events near Arctic Coastal Regions

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ABSTRACT

Climate change is causing the Arctic to warm, which has implications for conditions across North America and Eurasia. Changes in the Arctic affect seasonal snowpack conditions, sea ice, and soil characteristics, which might imply a changing susceptibility of large regions to disasters, such as wildfire or flooding, as warming continues. We have completed preliminary work looking at seasonal snowpack formation and trends by focusing on heavy snowfall events occurring early in the season. These were diagnosed and examined using reanalysis meteorological data and snow datasets generated by the recently updated Brown Temperature Index Model. Extreme events cause significant changes to the snow cover and snow depth on daily time scales. Across several Arctic regions, we identified important controls on these events, including a promising link between open (ice-free) ocean conditions and increased coastal snowfall in Eurasia. The results we present are robust across all datasets studied.

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