



Trends and Variability in Rain on Snow Events

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Rain on snow (ROS) events are a relatively rare phenomenon outside of a few regional maxima including western Eurasia, the higher elevations of western North America, the northeastern United States and southeastern Canada. Contrary to expectations in a warming climate, no robust trends were found in the frequency of ROS. We also explored the variability of ROS events with large climate modes in both the North Atlantic and the North Pacific sectors. The most robust relationship was found with the Arctic Oscillation or North Atlantic Oscillation (AO/NAO). The most notable variability associated with the AO/NAO was a northeast/southwest dipole feature across western Eurasia. More ROS events were found for northeastern Europe for the positive phase of the AO/NAO due to increased frequency of rainfall. However, more ROS events were found for Central Europe for the negative phase of the AO/NAO due to increased frequency of snow cover. We also explore variability in ROS events associated with climate modes of the North Pacific sector including ENSO.