

Public Abstract

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Title:Severe Winter Storms in Missouri from 1960-2010

Severe winter storms have cost the state of Missouri significant economic loss from property damage, crop destruction, and loss of livestock. Even worse than the economic loss from these storms are the injuries and deaths to humans that they sometimes cause. A severe winter storm is a storm with six inches or greater snowfall in 48 hours and/or an ice storm with  $\frac{1}{4}$  inch or greater ice accumulation from the storm. A severe winter storms climatology for Missouri from 1960-2010 was created to better understand the development, frequency, and intensity of severe winter storms in Missouri.

From the climatology, it was found that heavy snowfall events were by far the most common severe winter storm type in Missouri with 318 heavy snowfall events. Heavy ice events were the second most common with 66 events. Texas/West Gulf originating mid-latitude cyclones was responsible for the majority of severe winter storms in Missouri followed by Colorado originating mid-latitude cyclones. When looking at El Niño Southern Oscillation (ENSO) variability with heavy snowfall events, there is only a slight variation between the number of heavy snowfall events and the phase of the ENSO cycle they occur in. When all of the heavy snowfall events were averaged together there was only a slight difference in the average number of events per winter season during the negative phase of the Pacific Decadal Oscillation (PDO) (6.2) and the number of events per winter season during the positive phase of the PDO (6.5). When all heavy snowfall events were averaged together there is a 1.4 difference in the average number of events per year during the negative phase of the North Atlantic Oscillation (NAO) (4.6) and the positive phase of the NAO (6).

Shelter Mutual Insurance Company provided insurance data from 2000-2010 for 56 severe winter storms in Missouri. Claim payouts for these storms totaled \$28,543,020.65. Data from the Missouri Department of Transportation (MoDOT) for automobile accidents on Missouri interstates from 2000-2010 showed that there was the most snowfall related automobile accidents when snowfall was between 0-2.9 inches. The number of automobile accidents decreased with increasing snowfall amounts.