

GC31B-1176: Cold/Shoulder Season Precipitation Near 0°C Over Northern Eurasia

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Small changes in atmospheric conditions lead to major changes in the types or amount of near-0°C precipitation. For example, if near-surface temperatures are slightly above (below) 0°C, rain or wet snow (snow) occurs; if a slightly above-freezing inversion occurs (or not) aloft, freezing rain (snow) can reach the surface. It also needs to be recognized that solid precipitation amounts near 0°C (such as wet snow) can be the highest in a winter storm. With global climate change in the extratropics, the 0°C isotherm will not disappear and associated precipitation events will continue to occur. The near-0°C temperatures should generally move poleward and arrive at many locations earlier in spring or later in autumn. This could potentially affect the seasonal cycle of near-0°C precipitation. Alterations in temperatures, storm intensity and track will alter the likelihood and occurrence of near-0°C precipitation including freezing rain. Weakening of the atmospheric circulation in the extratropical regions may lead to more polar jet stream meandering that can lead to more persistent near 0°C events. The overall warming, together with a larger influx of the water vapor in the winter atmosphere from the oceans (including ice-free portions of the Arctic Ocean) can also affect the amount of near-0°C precipitation. The overall issue of near 0°C precipitation is linked with several hazardous phenomena including heavy snowfall/rainfall transition around °C; strong blizzards; rain-on-snow events causing floods; freezing rain and freezing drizzle; and ice load on infrastructure. In our presentation, we present the empirical evidence about changes in occurrence and intensity of these phenomena over Northern Eurasia.