

Very heavy rains and prolonged no-rain periods in the Pacific Sector of the Northern Extratropics

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Using the Global Historical Climatology Daily Network data set (GHCN-Daily), we assessed changes in intense precipitation (above 12.7 mm) and prolonged no-rain periods across the Northern Extratropics. Intense precipitation was further partitioned into heavy, very heavy and extreme daily and multi-day rain events. In this presentation, we shall focus on the regions adjacent to the Pacific Ocean: Asian Russia, Japan, Alaska, British Columbia, the western contiguous US, and northern Mexico.

During the past sixty years, increases in very heavy and extreme rainfall were documented in the warm season over most of the Northern Extratropics. In several of them, while the mean seasonal precipitation was decreasing, the frequencies of very heavy and extreme rain events were increasing or have not been changed. Recent updates and infill of precipitation data available through GHCN-Daily allowed us to confirm our previous findings (Easterling et al. 2000) of this behavior for Asian Russia and Japan. Decreases in summer rainfall totals and frequency here are accompanied by increases in the frequency of very heavy daily rain events. Moreover, over most of Northern Asia (Siberia, northeastern China), various characteristics of summer dryness (fire indices, PDSI, no-rain intervals) indicate drier weather conditions in the past several decades.

We conclude that the atmospheric component of the hydrological cycle over the northern extratropical part of the Pacific Rim became more variable in the past decades.

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