Unseasonable weather conditions in East Asia in summer 2014

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Parts of East Asia experienced unseasonable weather conditions such as severe drought in northern China due to a lack of precipitation during summer 2014 and heavy rainfall in southern China, Japan and South Korea in August.

During the East Asian rainy season that approximately persists from June to July, total precipitation amounts were below normal in northeastern China, Huaihe river basin, South Korea and many parts of the main island in Japan. Dry conditions in northern China persisted during August. In contrast to dry conditions for June and July, South Korea and Japan experienced above normal precipitations in August. In Japan, from 30 July to 26 August, heavy rainfall events were observed throughout the country. Monthly precipitation ratio averaged over the Pacific side of western Japan was 301 % of normal (the highest on record for August since 1946).

The causes of this extremely wet conditions are analyzed to be threefold: (i) Typhoon Nakri and Typhoon Halong in early August, which moved slowly northward and made landfall over western Japan for a longer time than otherwise; (ii) synoptic-scale fronts around the nation's mainland in mid- to late August, which were associated with the southward meandering of the subtropical jet stream to the west of Japan; (iii) the Pacific High that was enhanced to the southeast of Japan, combined with anti-cyclonic circulation anomalies in the lower-troposphere around the Philippines, leading to persistent moist air flow into southeastern China, a southern part of South Korea and mainland of Japan.

One of the primary factors having contributed to the jet stream meandering and the anti-cyclonic circulation anomalies in the lower-troposphere is presumably suppressed convective activity around the Philippines. This suppressed convective activity was considered to be the influence of downward air flow over the Philippines in association with upward air flow in line with enhanced convective activity over the eastern Pacific and the eastern Indian Ocean, as well as the tropical intra-seasonal variability that coincidentally came into the phase of inactive convection around the Philippines.

Possible primary factors contributing to the unseasonable weather conditions in summer are summarized below.