

ENSO and its influence over East Asia

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Abstract

ENSO affects the atmospheric circulation not only in the tropics but also in the extratropics of East Asia during the winter monsoon season. It sometimes brings anomalous weather. For example, during La Niña event, below normal temperature tends to be observed over East Asia. La Niña events occurred in 2005/2006 and 2007/2008 winter and cold weather were observed in East Asia in both winters. However, the influence of ENSO for the climate over East Asia was obvious in 2005/2006 winter, but, it was not clearly seen during 2007/2008 winter.

In December 2005, it was extremely cold over northeastern Asia, and monthly mean temperature of Japan was the lowest since 1948. It was found that the extremely active cumulus convection over the Bay of Bengal, the South China Sea and the Philippine Sea associated with the La Nina event was deeply related to the cold weather, besides the influence of the persistency of the negative phase of the Arctic Oscillation (AO). The stationary Rossby wave train along the strong Asian Jet, which was excited by the active cumulus convection over those areas, caused the persistent and large-amplitude meandering of the jet, leading to the repetitive cold air outbreaks in and around Japan. Since these atmospheric features are clearly seen in the statistical research, it may be a typical mechanism of ENSO for Asian climate.

However in 2007/2008 winter these features were not obvious although cold weather was observed in East Asia. In the second half of the winter, the strengthened Siberian high associated with developed ridge over central Asia brought extremely cold weather over East Asia. Although, active cumulus convection over the South China Sea and the Philippine Sea associated with the La Niña event was observed during the period, it was not clear how it helped to bring cold weather over East Asia. Hence the mechanism of ENSO for Asian climate is thus not simple, more investigation is needed.

For 2008/2009 winter climate prediction, although the SST averaged over the NINO.3 region was near normal (+0.2 degree) in September 2008, conditions of subsurface temperatures and atmospheric circulations in the equatorial Pacific showed

no signs of increasing or decreasing SST anomalies in the central and eastern equatorial Pacific. The JMA's El Niño forecast model predicts that the NINO.3 SST will be near normal during winter 2008/2009. Considering all the above, the NINO.3 SST is likely to be near normal in the months ahead. It is unlikely that an El Niño or a La Niña event will develop during the winter. Since ,the El Niño and La Niña are the most important climate events as grounds for the seasonal prediction and these events are unlikely to develop during the winter, high predictability of the coming winter season prediction is not expected.