# Seasonal Outlook for winter 2012/2013 over Japan

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## Abstract

### 1. Oceanic conditions

In August 2012, the NINO.3 SST deviation was +0.7°C. SSTs from the central equatorial Pacific to the eastern part were above normal. Subsurface temperatures were above normal in almost all regions from the western equatorial Pacific to the eastern part. On the other hand, the convective activities in the atmosphere were near normal in most of the equatorial Pacific, and easterly winds in the lower troposphere were near normal in the central part. Although these atmospheric conditions do not indicate features of El Niño conditions clearly, the oceanic conditions were favorable for maintenance of above normal SSTs in the NINO.3 region. These oceanic conditions indicate that El Niño conditions persisted in the equatorial Pacific.

The JMA's coupled global circulation model predicts that the NINO.3 SST will be mostly above normal during the coming winter.

Considering all the above, it is likely that El Niño conditions will last until the coming winter (December-January-February).

### 2. Interpretation of ensemble prediction products

In association with the SST anomaly pattern, the predicted ensemble averaged atmospheric circulation anomaly pattern by the model is similar to that of typical El Nino events in and around the tropics. In the lower troposphere, equatorially symmetric anti-cyclonic circulation anomalies from the eastern Indian Ocean to the maritime continent and equatorially symmetric cyclonic circulation anomalies in the central Pacific are predicted. There is a possibility that the anti-cyclonic circulation anomaly extending to the south of Japan will bring warm and humid air to the south of Japan and create favorable conditions for the genesis of cyclones there. In the upper troposphere, equatorially symmetric cyclonic circulation anomalies around the maritime continent and anti-cyclonic circulation anomalies from the central to eastern Pacific are predicted. Corresponding to the cyclonic circulation anomaly in the northern hemisphere, the subtropical jet streams shift southward over China and northward over Japan, suggesting weak winter monsoon around Japan.

In the mid- and high-latitudes, a slight negative tendency of the Arctic Oscillation (AO) is predicted. The negative phase of AO tends to cause strong winter monsoon and below-normal temperature in northern Japan. However, the spread among the ensemble members is large. Therefore, the model results in the mid- and high-latitudes should be interpreted with caution.

## 3. Conclusion

The JMA's coupled global circulation model predicts the feature of the El Nino condition over the south of Japan which suggests warm and humid air advection over Okinawa/Amami. In the mid- and high-latitudes, a slight negative tendency of the Arctic Oscillation (AO) and a trough/ ridge pattern are predicted. However, considering the prediction skill of them, it is most likely that the feature of El Nino appears around Japan in response to the tropical conditions.

## 4. Summary of the Outlook for Japan (December 2012 to February 2013)

Three-monthly mean temperatures are expected to be both near-normal and above-normal with 40% probability in eastern and western Japan and Okinawa/Amami.

Three-month total precipitation amounts are expected to be both near-normal and above-normal with 40% probability in Okinawa/Amami.

Three-month total snowfall amounts on the Sea of Japan side of Japan are expected to be both near-normal and below-normal with 40% probability in eastern and western Japan.

### Temperature

| Category | − | 0 | + |
|---|---|---|---|
| Northern Japan | 30 | 40 | 30 |
| Eastern Japan | 20 | 40 | 40 |
| Western Japan | 20 | 40 | 40 |
| Amami and Okinawa | 20 | 40 | 40 |


(Category −: below normal, 0 : normal, + : above normal, Unit : %)

### Precipitation

| Category | | − | 0 | + |
|---|---|---|---|---|
| Northern Japan | Sea of Japan side | 30 | 40 | 30 |
| | Pacific side | 30 | 40 | 30 |
| Eastern Japan | Sea of Japan side | 40 | 30 | 30 |
| | Pacific side | 30 | 30 | 40 |
| Western Japan | Sea of Japan side | 30 | 40 | 30 |
| | Pacific side | 30 | 30 | 40 |
| Amami and Okinawa | | 20 | 40 | 40 |


(Category −: below normal, 0 : normal, + : above normal, Unit : %)