



# **Cold Season Outlook over Japan in 2005/2006**

Climate Prediction Division

Japan Meteorological Agency (JMA)



# Focus for this Cold Season outlook

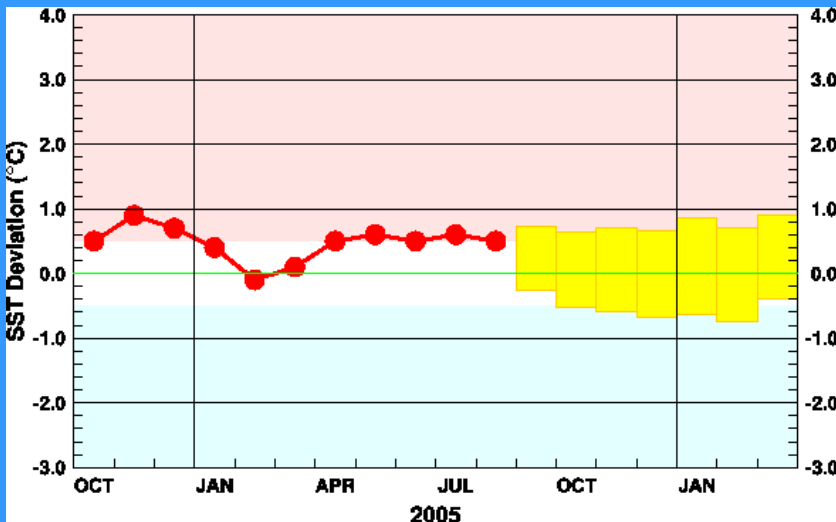
1. Niño 3 Sea Surface Temperatures (SST).
2. Mean tropospheric temperature in mid-latitudes.
3. Results of Numerical and Statistical model.
4. Features of surface temperatures in recent winters.
5. Behavior of EOF1 (similar to A0)



# Sea Surface Temperature

The sea surface temperatures in the equatorial Pacific were generally above normal in August 2005. However, the SST anomaly in Niño 3 region became smaller in last ten days of August and it is likely to be around normal during this autumn and winter.

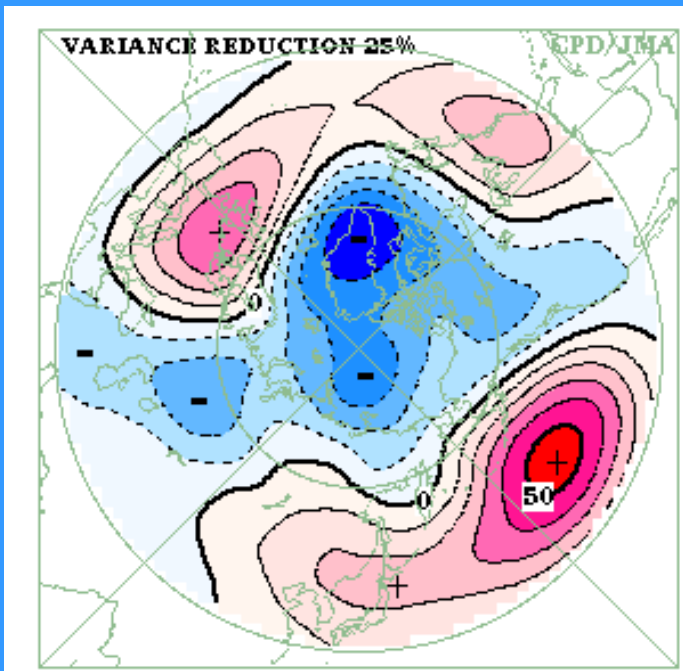
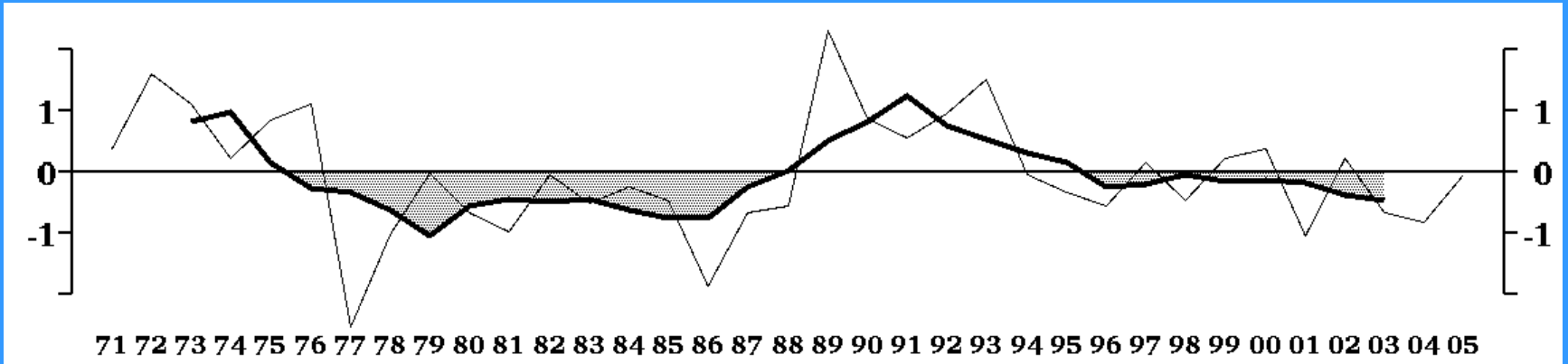
It is unlikely that El Niño or La Niña will develop during this winter. So, the El Niño or La Niña is not taken into account.



Outlook of the SST deviation for Region B (Niño.3) with the El Niño forecast model with MOS



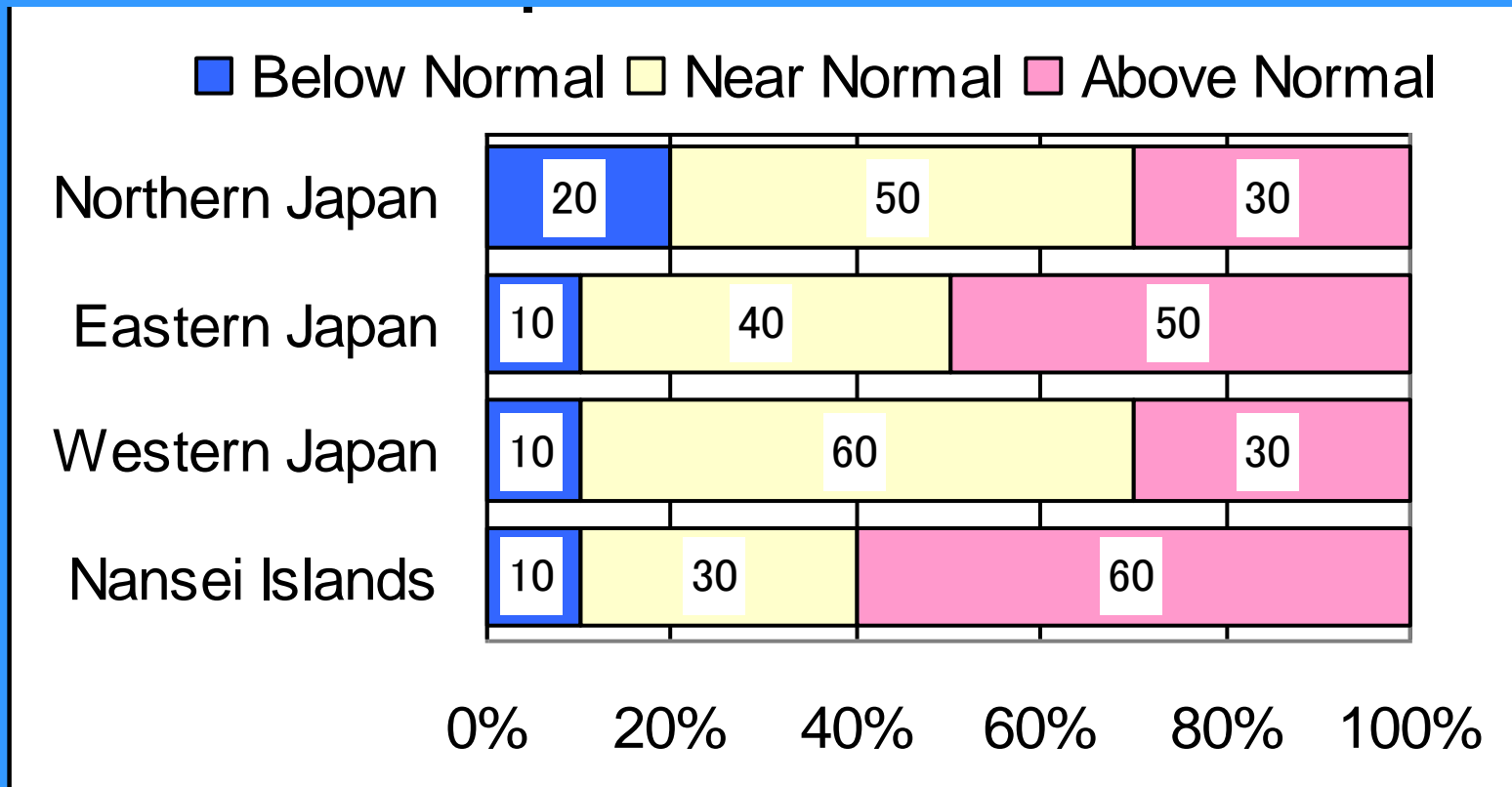
# Time series of winter EOF1(AO index) score from 1971 to 2005 (NH500)



- The winter mean AO index tends to be negative since the latter half of 1990's.
- This suggests the polar air mass is likely to flow out over the North Pacific, which might occasionally cause cold winters in the northern part of Japan.



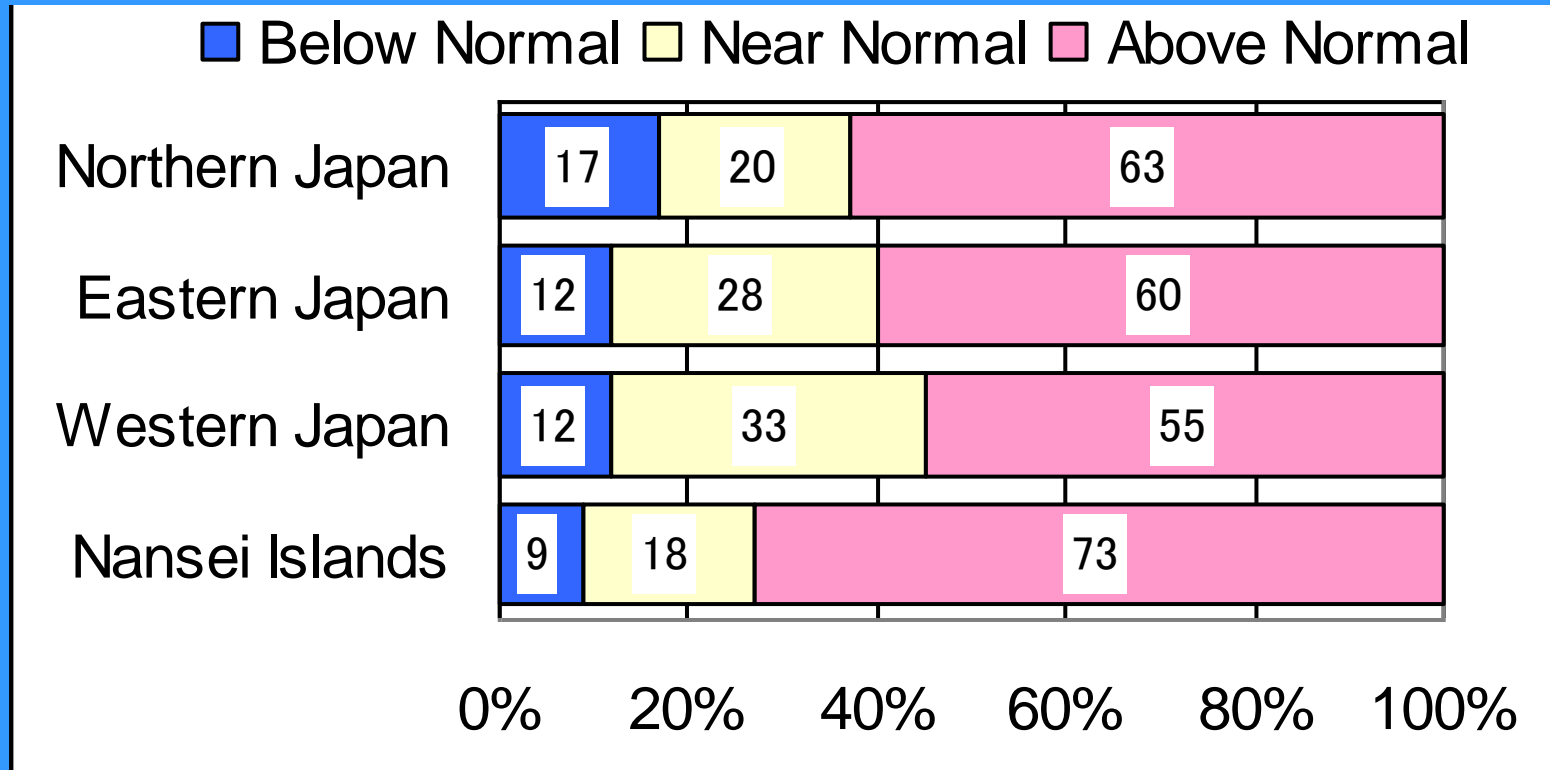
# Predicted Probability of Winter Temperature using OCN (Optimal Climate Normals)



- Statistics of winter temperatures in the last ten years show :  
**The winter mean temperatures in Japan are near or above normal, especially in the Nansei Islands.**



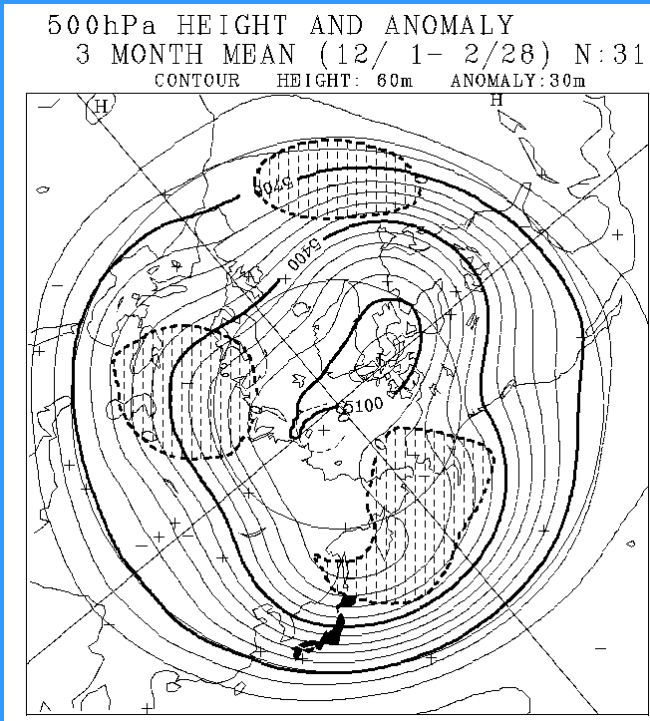
# Predicted Probability of Winter Temperature using CCA (Canonical Correlation Analysis)



•A statistical method (CCA) predicts higher-than-normal winter temperature.



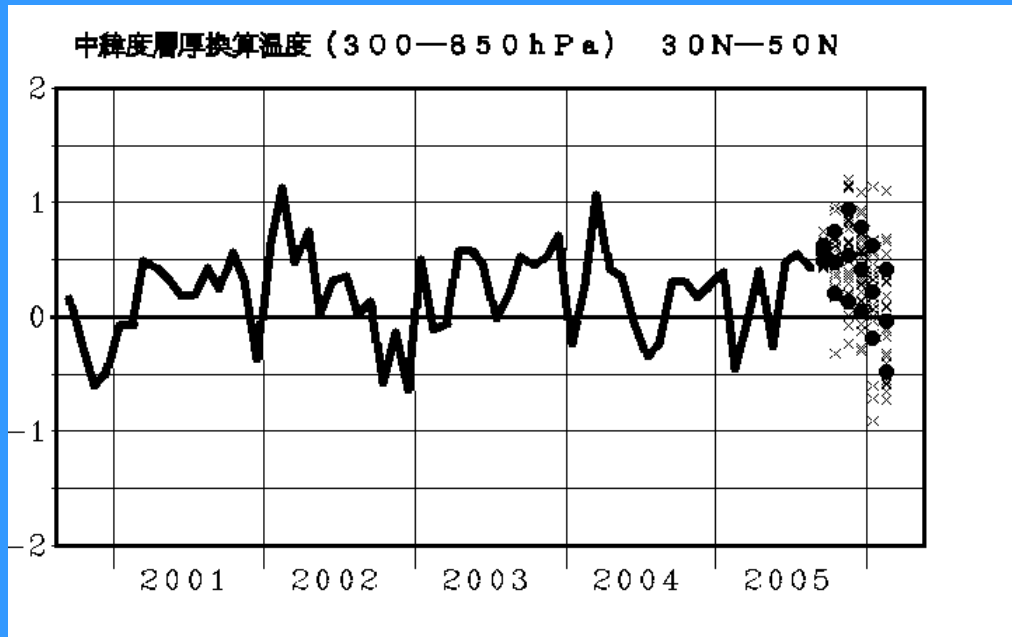
# 500hPa Height and anomaly



- The winter mean 500hPa height anomalies will be above normal over most parts of the northern hemisphere, except in the following three areas: the European part of Russia, around the Aleutian in the northern part of the Pacific and Northern part of the Atlantic. However, the probability of below-normal categories are not so high in these three areas.
- These suggest that temperatures will be above normal over eastern Asia, though cold surges may affect the Northern parts of the region.



# Mean tropospheric temperature in mid-latitudes

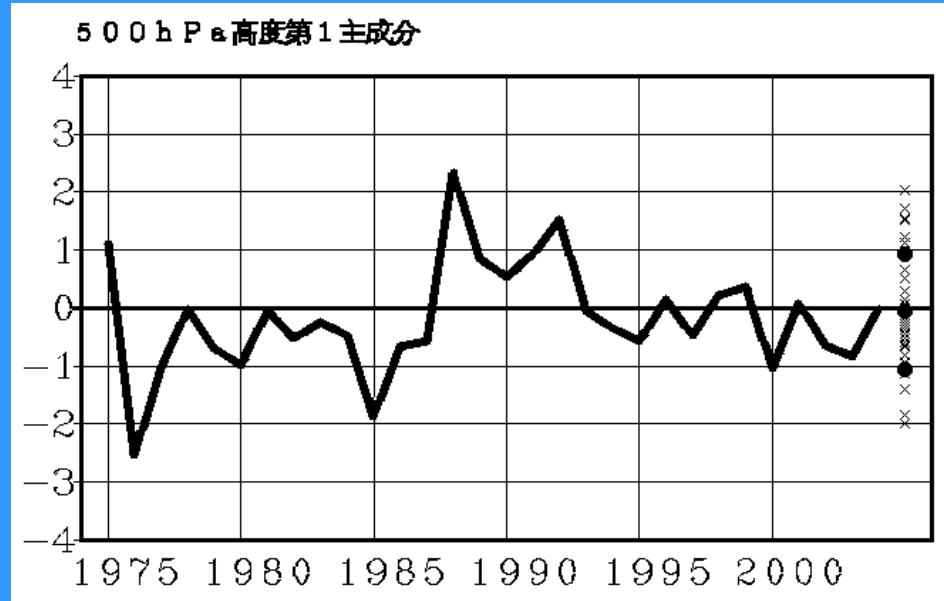
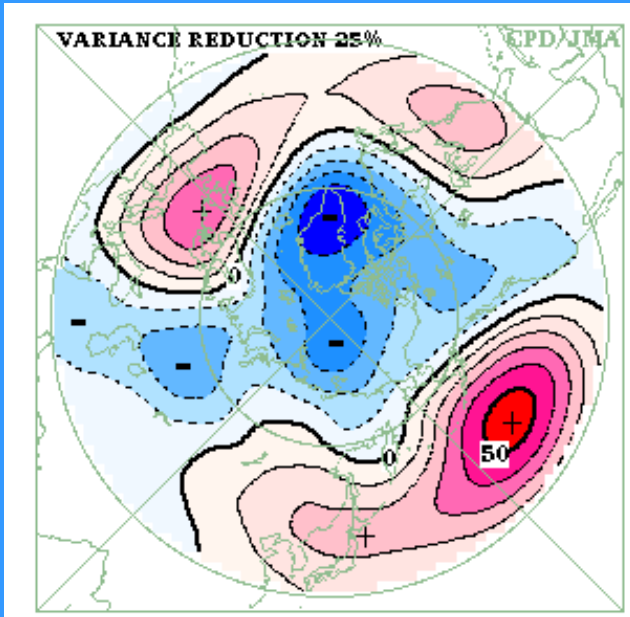


- The thickness temperature between 300hPa and 850hPa averaged over the mid-latitudes (30° N-50° N) is positively correlated with the temperatures in Japan.
- It generally continues above normal since 2003, and this situation is likely to persist during this winter.





# The AO index of ensemble mean prediction

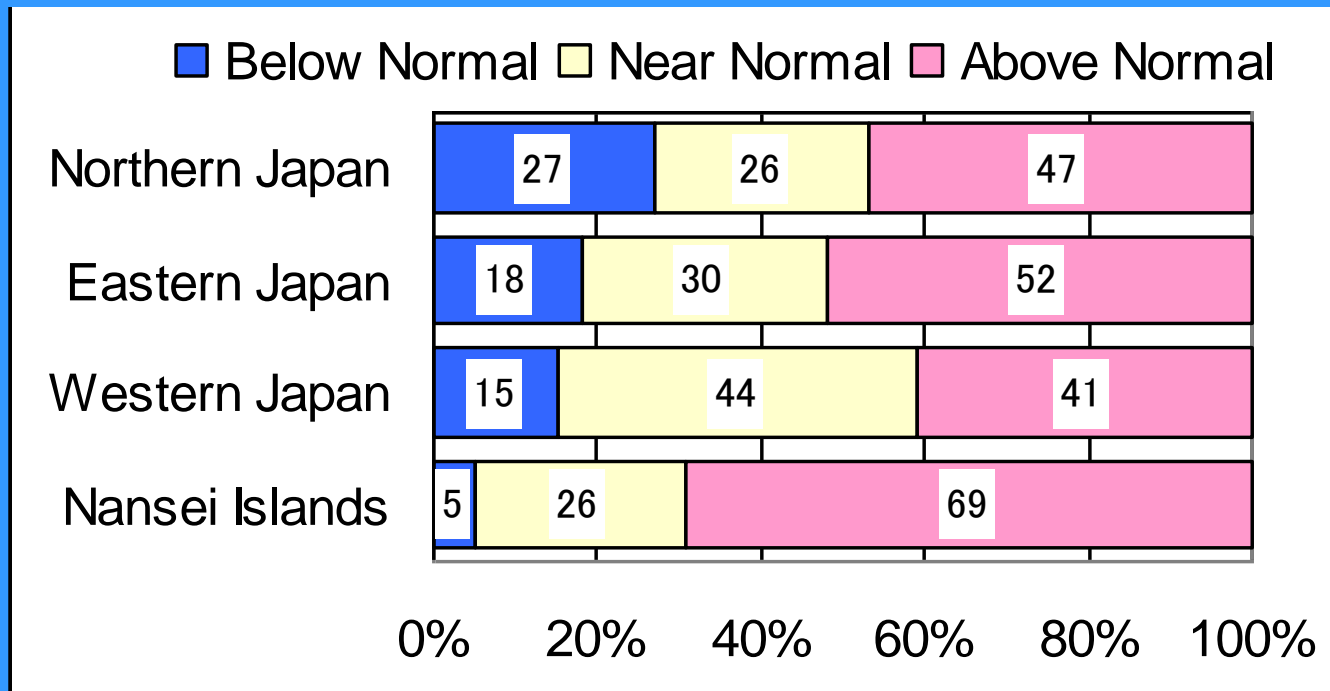


- The AO index of ensemble mean prediction is near normal with considerable spread among the members.
- This means that the seasonal prediction has large uncertainty in the area where the climate is strongly affected by the AO, such as the northern part of Japan.



# Interpretations of the EPS outputs of Temperature in 2005

- Model outputs are translated into probabilities of three-month average temperature with a multiple regression scheme.



- **The average temperature in winter 2005/2006: categories of “normal” or “above normal” have high probability.**



# Conclusion

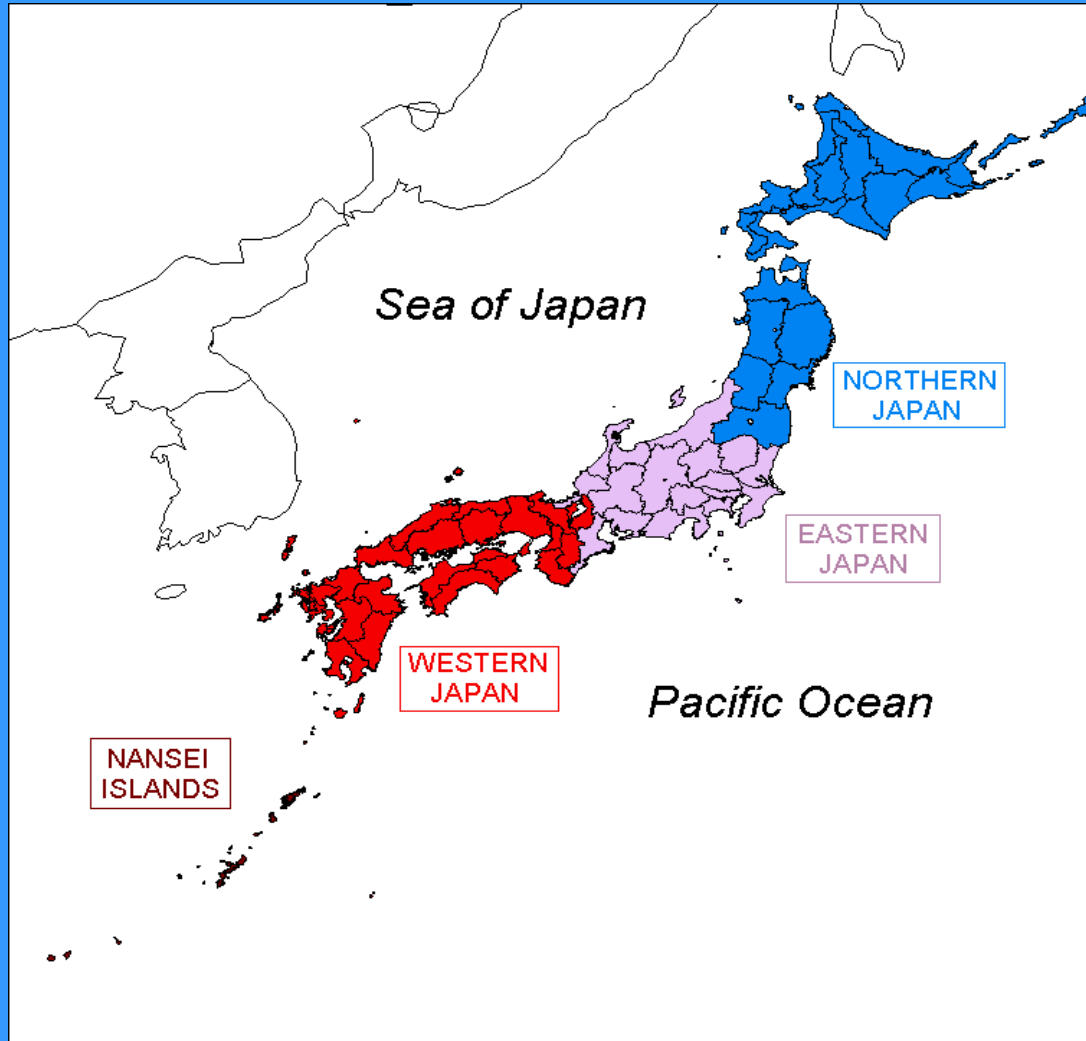
- (1) The Niño 3 (Region B ) SST is likely to be around normal in this autumn and winter. It is unlikely that either El Niño or La Niña will develop throughout the prediction period.
- (2) Mean tropospheric temperature in the NH mid-latitudes generally continues above since 2003, and this condition is likely to persist during this winter.
- (3) Both numerical and statistical model predict warm winter.

It is caused by sea surface temperature in the equatorial lasting high.

- (4) The AO index tends to be negative since the latter half of 1990's, and the AO index of the ensemble mean prediction is near normal with considerable spread among the ensemble members, the influence of cold outbreak is not ignored in the Northern Japan .

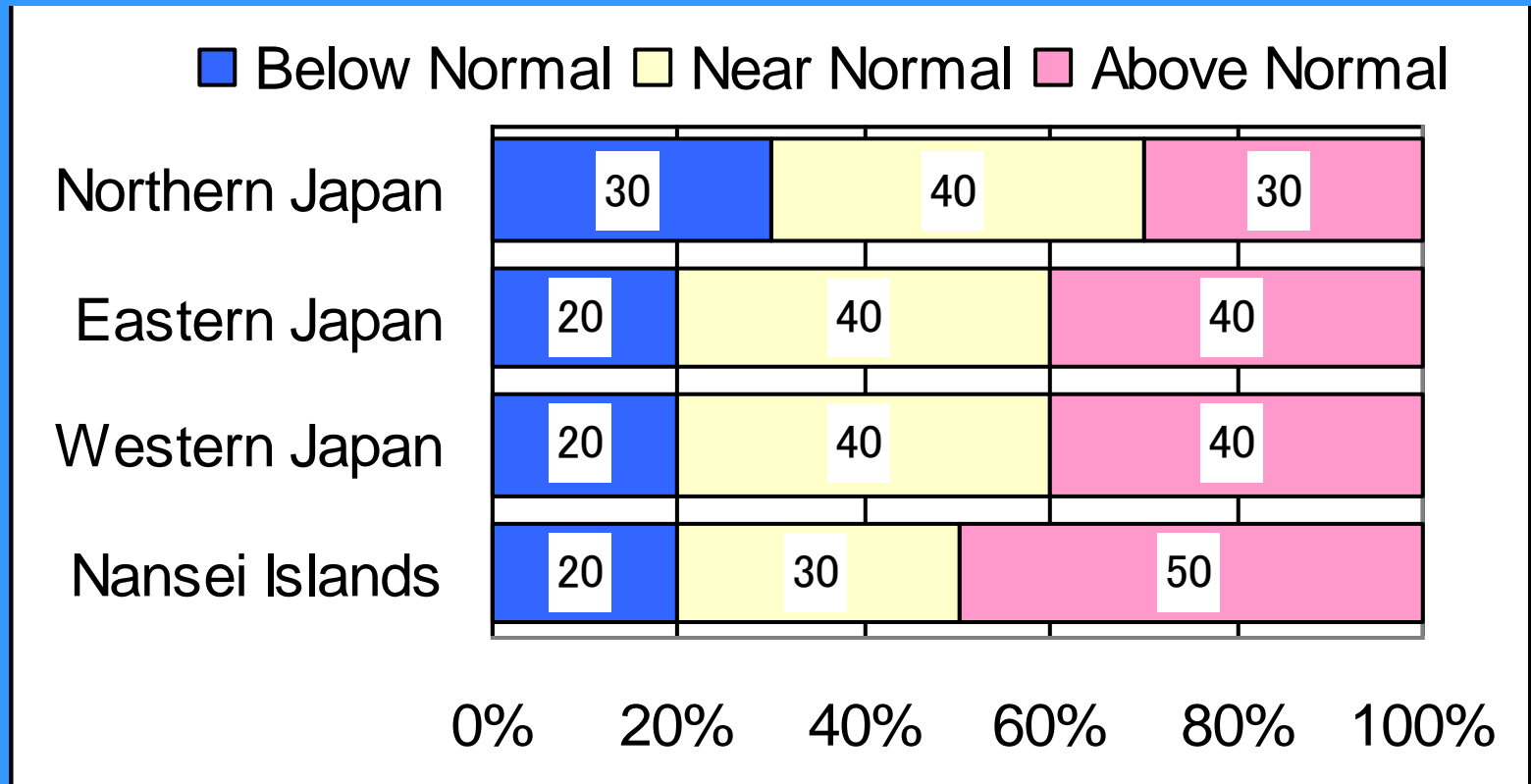


# Regions for the nation-wide forecast



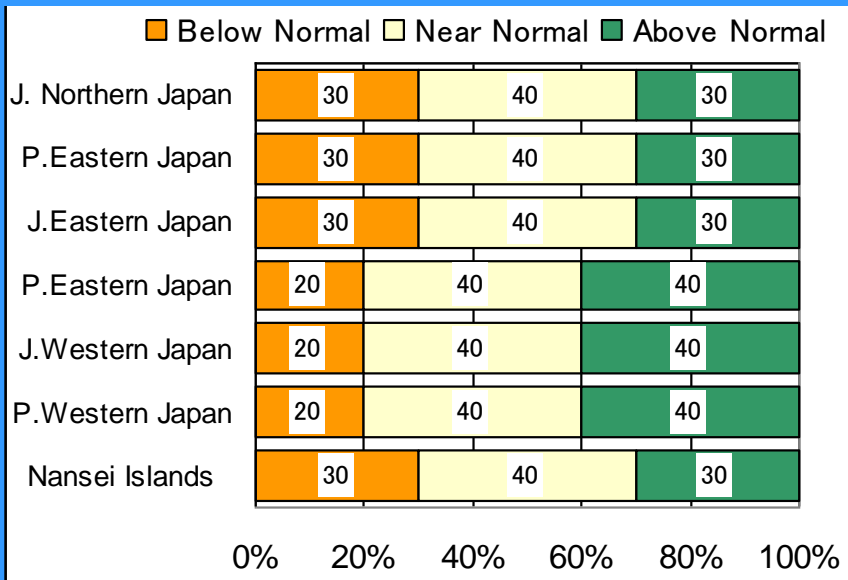


# Probability of mean temperature for winter (Dec.-Feb.) 2005/2006

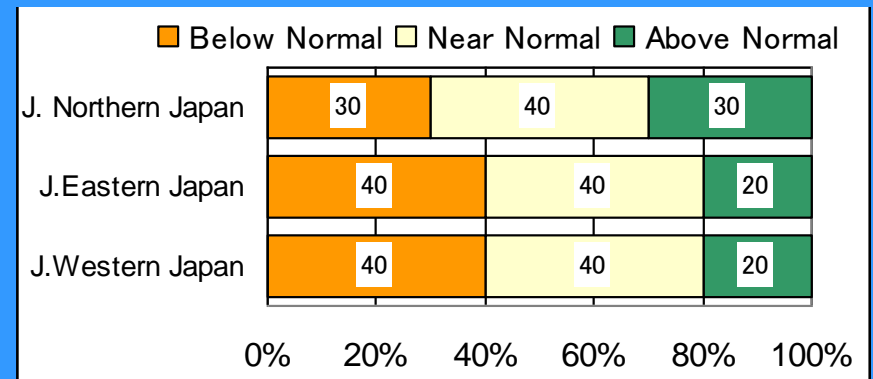




# Probability of precipitation amounts and snowfall amounts for the Winter(Dec.-Feb.) 2005/2006



Precipitation amounts



Snowfall amounts