Recent Progress of Climate-related Researches at JMA

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1. Brief introduction of the JRA-25 data

Japanese 25-year ReAnalysis project (JRA), which is a joint research project of JMA and CRIEPI, completed its task in March 2006. JRA-25's data period is from Jan.1979 to Dec.2004 (26 years) with JCDAS (from Jan.2005 to present) as its successor.

JRA-25 official data and near-real-time JCDAS data are now available via Internet. JRA-25 official website: http://jra.kishou.go.jp/ Registration is necessary for downloading the data.

2. Statistical relationship between the NINO SSTs and the climate over the globe using the JRA and COBE-SST data.

2.1 Statistical relationship between the NINO SSTs and the surface climate anomalies in the world

During El Niño events, Japan except its northern part is likely to experience warm in winter and spring, while cool in autumn together with the Korean Peninsula and northeastern China. Southeast Asia tends to experience warm and dry throughout the year except summer.

2.2 Statistical relationship between the NINO SSTs and the circulation anomalies over the globe

A couple of cyclonic (anti-cyclonic) anomalies on both sides of the equator are seen over the eastern Pacific (Southeast Asia and Australia) at 200hPa with opposite sign anomalies underneath. Those patterns are consistent with the response to the typical equatorial heating anomalies. The areas of the 5% significance level in the new analysis (left lower panel) are much wider than in the former analysis

3. Verification of the JMA's Seasonal Ensemble Prediction based on the Long-term Hindcasts

JMA executed 21-year (1983-2003) hindcast experiment with AGCM (TL95L40). It's main results are summarized as follows; 1) Forecast skill in temperature is significant; 2) Forecast skill in precipitation is marginal (slightly positive); 3) Forecast skills are better in ENSO years; and 4) Forecast skill in precipitation in WNPSM region is good.

4. Development of the Next Generation El Niño Prediction System (Unified Coupled Ocean-Atmosphere GCM)

The next generation El Niño Prediction System base on a new coupled atmosphere-ocean model is being developed at MRI/JMA. The system consists of a) the TL95L40 version of the JMA atmospheric model, b) the new MRI Community Ocean Model (MRI.COM) and c) the new Ocean Data Assimilation System "Multivariate Ocean Variational Estimation System (MOVE)".

We are planning to replace the current JMA operational system in 2008.