

# Preliminary Experiments for Japanese 25-year Reanalysis Project

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## **1. Introduction**

Japan Meteorological Agency (JMA) and Central Research Institute of Electric Power Industry (CRIEPI) made a contract to conduct a reanalysis as a cooperative research project denominated as JRA-25 (Japanese 25-year Reanalysis Project). The target years of the reanalysis are from 1979 to 2004. JMA and CRIEPI agreed to offer their technical experts, software and computational resources. The period of the contract is for the fiscal years from 2001 to 2005. Reanalysis production will be started late 2003.

## **2. Observational data and Numerical models**

### **1) Observational data**

Conventional data, Atmospheric Motion Vector (AMV) wind data by geostationally satellites and TOVS, SSM/I data by polar orbital satellites will be assimilated in JMA operational model. Data sources are JMA archives and ERA-40 observational data used in ERA-40, which includes the data used in NCEP/NCAR reanalysis. Historical position data of tropical cyclones (TC) and retrieved wind data surrounding TCs were provided by Dr. Fiorino (LLNL/PCMDI). The latter are assimilated to express TCs accurately. GMS AMV data reprocessed by Meteorological Satellite Center (MSC/JMA) from April 1987 onward are assimilated as well.

### **2) Numerical Models**

JMA operational 3DVAR global assimilation system will be used in JRA-25. TOVS 1d data are assimilated in the system. The forecast model for JRA-25 is T106-L40 global model with the top level at 0.4hPa based on the current operational T213-L40 model. For land surface processes, JMA operational SiB scheme is driven by atmospheric forcing parameters. Snow depth analysis is operated once a day using surface snow data. COBE (Centennial in-situ-Observation-Based Estimate of variability of SST and marine meteorological variables) SST data set, which is produced by CPD/JMA by assimilating historical marine observations and covers whole period of JRA-25, will be used.

## **3. Preliminary experiments**

We have made some experiments to investigate impacts of observational data and schemes to be used in JRA-25 before starting production.

### **1) Impact of the TC retrieval wind data**

An experiment is performed to investigate impacts of TC retrieval wind data. Figure 1 shows analysis fields with(top)/without(bottom) the retrieval wind data for North-Western and North-Eastern Pacific Ocean respectively at 18UTC 15th September 1990 during SPECTRUM period. Although TCs are not analyzed in NE Pacific and poorly analyzed in NW Pacific without the retrieval wind data, they are analyzed correctly at their reported position with the retrieval data.

### **2) Land surface processes and Snow analysis**

An experimental data assimilation cycle was executed over 8 month from 1st October 1988. Time series of analyzed snow coverage over Eurasia and North America continents are shown in Figure 2. Snow coverage change naturally during the winter and spring for each continent.

### **3) Quality of reprocessed GMS AMV data**

Quality of reprocessed GMS AMV data were investigated. A Quality Indicator (QI) is attached on each AMV datum. The data are categorized by QI and compared with first guess fields. The first guess fields were created without using the reprocessed AMV data. Data of high quality (QI $\geq$ 85%) have good consistency with first guess field (Figure 3) and few data are rejected by quality controls.

Other experiments will be made further before starting production of JRA-25.

## **Reference and Acknowledgement**

Details of JRA-25 can be referred from <http://www.jreap.org/indexe.html>. We express special thanks to ECMWF and other organizations and individuals who provided observational data.

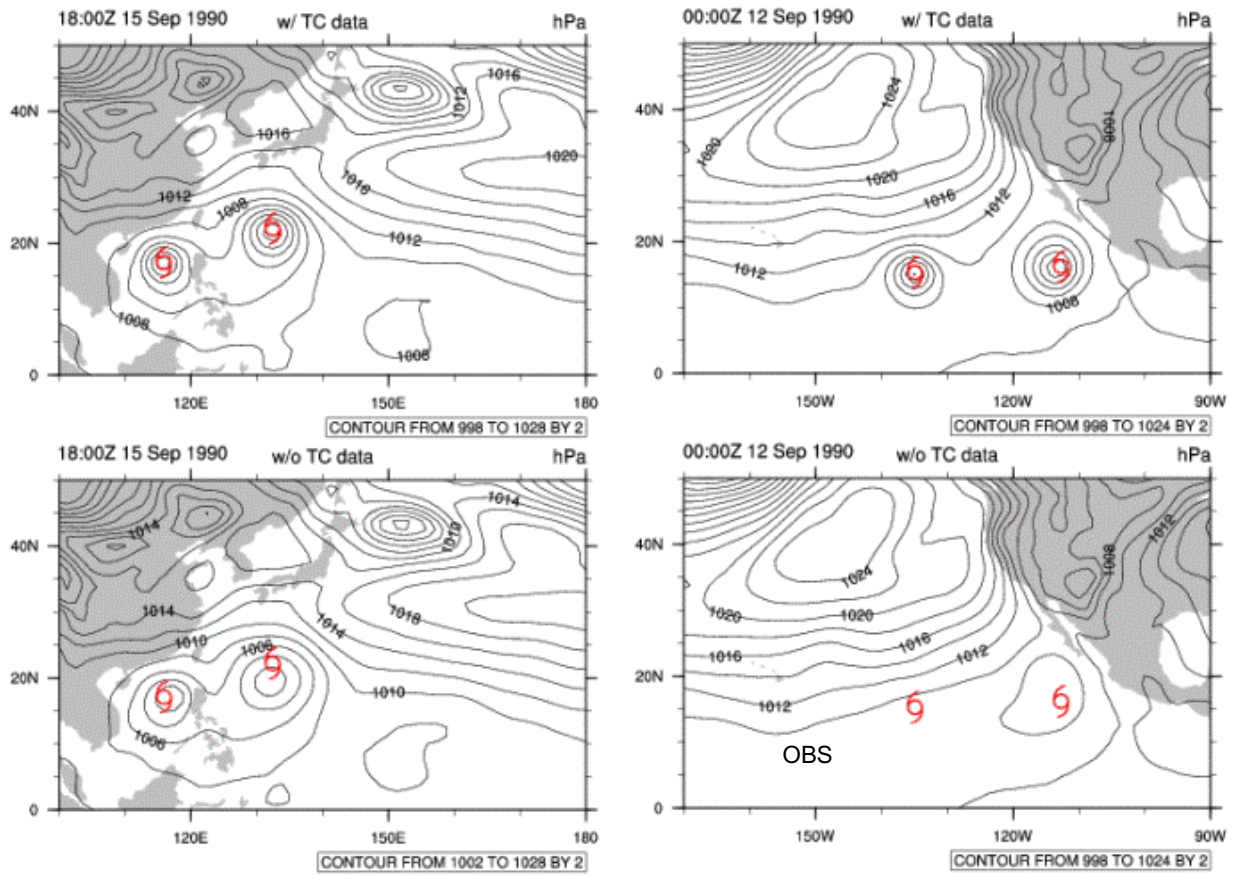


Figure 1 MSLP analysis field of North-Western (left) and North-Eastern (right) Pacific with (top) / without (bottom) TC wind retrieval data.

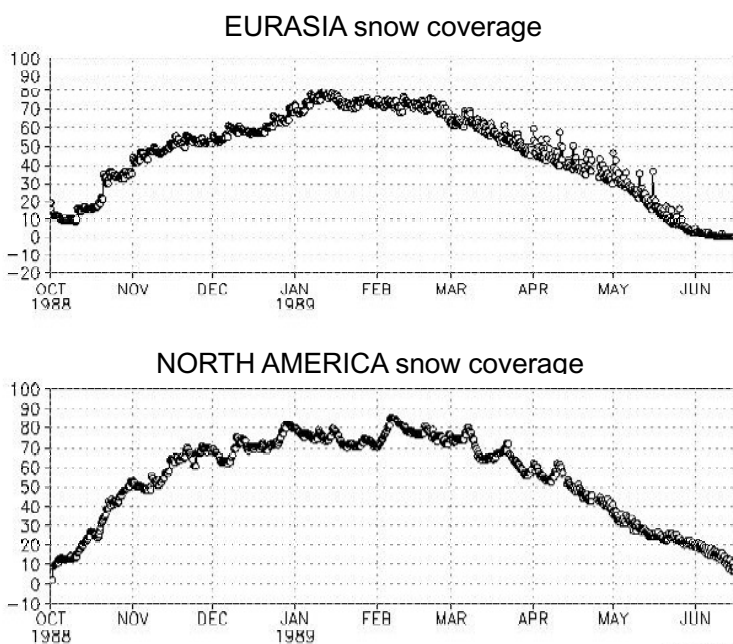


Figure 2 Time series of snow coverage of Eurasia (top) and North America (bottom) continent from 1988.10 to 1989.6

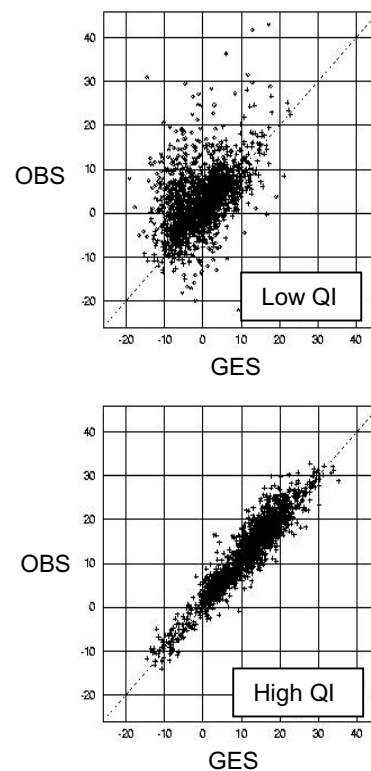


Figure 3 Scatter diagrams of reprocessed GMS AMV data (Low level U-comp. wind) for low QI data (top) and high QI data (bottom)