

### 3.8 Sea Surface Temperature Analysis for Global Model

Global sea surface temperature (SST) with 1.0-degree latitude/longitude resolution is analyzed every day. A two-dimensional optimum interpolation is employed. The first guess is a climatological SST analyzed by NCEP (Reynolds and Smith 1994). SST data from ships and buoys and AVHRR SST data from NOAA satellites during the past 5 days are used in the analysis. The weights of these data in the interpolation depend on the time difference between the observation time and the analysis time. The analyzed SST is used as a lower boundary condition in the operational global model on the next day. (See also 6.2 for the other SST analysis products.)

#### Reference

Reynolds, R.W. and T.M. Smith, 1994: Improved Global Sea Surface Temperature Analysis Using Optimum Interpolation., *J. Climate.*, **7**, 929–948.

### 3.9 Snow depth analysis

Global snow depth with 1.0-degree latitude/longitude resolution is analyzed every day. The analysis method is a two-dimensional optimum interpolation (OI). The first guess is prepared as follows,

$$GUESS = CLIM + \frac{1}{2} ANOM \quad (3.9.1)$$

where *GUESS*, *CLIM* and *ANOM* are the first guess, the climatological value interpolated to the analysis day from the monthly climate data, and the analyzed anomaly from the climatological value on the previous day, respectively. The monthly climate data used from September to June were the climatology compiled by USAF/ETAC (Foster and Davy 1988), and those for July and August were interpolated from the climatology for June and September.

Firstly, snow detection is carried out, based on the SSM/I daily climatology. Only grid points where snow cover fraction is larger than zero are analyzed using SYNOP snow depth data on the day. However, if the grid point is specified to the non-analyzing point (that is, snow cover fraction at the grid point is zero), *CLIM* is assigned to the analyzed value at the grid point.

The analyzed snow depth is used as an initial condition of snow water equivalent for the land-surface process (SiB) in the GSM on the next day.

#### Reference

Foster, D.J. and R.D. Davy, 1988: Global Snow Depth Climatology. USAF-ETAC/TN-88/006, Scott Air Force Base, Illinois, 48pp.