3.5.6.1 Special Bureau for the Atmosphere

In conjunction with the U.S. National Oceanic and Atmospheric Administration (NOAA), the SBAtmosphere has produced data from 4 different operational meteorological centres. We have also produced data from atmospheric reanalyses, spanning back to 1948. SBAtmosphere organized a system to operate in two modes. In the first, it supplies the data in near-real time through the service at NOAA, including analysis and forecast terms. In the second mode, it updates monthly archives of the data on the FTP server at the Atmospheric and Environmental Research, Inc. (AER).

The principal data prepared relate to atmospheric excitations of Earth rotation vector, as forced by changes in the winds and surface pressure of the atmosphere, known respectively also as the motion and mass terms of the atmospheric angular momentum AAM. For the axial component, related to length of day, the stronger term is the motion one, and for the equatorial term, related to polar motion, the mass term dominates. An “inverted barometer” correction is produced to the mass terms, designed to model an equilibrium condition of the oceans in which the ocean depresses in response to a higher atmospheric pressure and rises in response to a lower one.

SBAtmosphere also computes the AAM terms locally, in a number of equal-area sectors distributed around the globe, as well as globally. In addition, SBAtmosphere computes the mean atmospheric surface pressure over the globe, and various spherical harmonics, which are related to the Stokes coefficients of the Earth gravity field. SBAtmosphere archives torques from the NCEP-NCAR reanalyses that relate to the angular momentum transfer from atmosphere to solid Earth, including topographic (mountain), friction (stress) and gravity wave drag torques. Users log in to our ftp sites to obtain the desired information.

David A. Salstein