

Description of the ECMWF Data Over an Ocean Area Adjacent to the NSA Coast

This dataset is derived from the ECMWF six-hourly analysis and model forecast data for the period from 00Z 5 October to 12Z 22 October 2004 over an area of the ocean adjacent to the NSA coast as shown in Figure 1. The horizontal wind components, temperature, and moisture are taken from the ECMWF data assimilation. The fluxes, e.g., precipitation, radiative, and turbulent fluxes, are computed in the first guess forecasts by the model physics. The large-scale forcing terms, i.e., vertical velocity and advective tendencies of temperature and moisture, are derived using the variational analysis approach developed by Zhang and Lin (1997) and Zhang et al. (2001), in which the atmospheric state variables are adjusted to conserve the column-integrated mass. The surface albedo is calculated from surface downwelling sw and surface upwelling sw and at night, values are set to -9999. Other constraints (e.g., heat and moisture constraints) are not used in the variational analysis because the model-produced fluxes are not reliable and no observations are available over the ocean area. The ECMWF data are interpolated onto a 3-hour time interval and a 25-mb vertical resolution. All the data in this dataset represent an average over the analysis domain centered at (151W, 71.75N) as shown in Figure 1. The derived vertical velocity and total advective tendencies of dry static energy and moisture are shown in Figure 2.

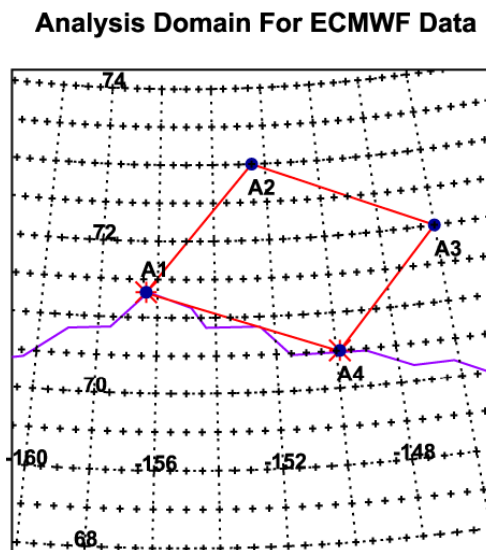


Figure 1. Location of the analysis domain, which is enclosed by the analysis grid points A1-A4. “+” symbols denote the ECMWF model output grid points.

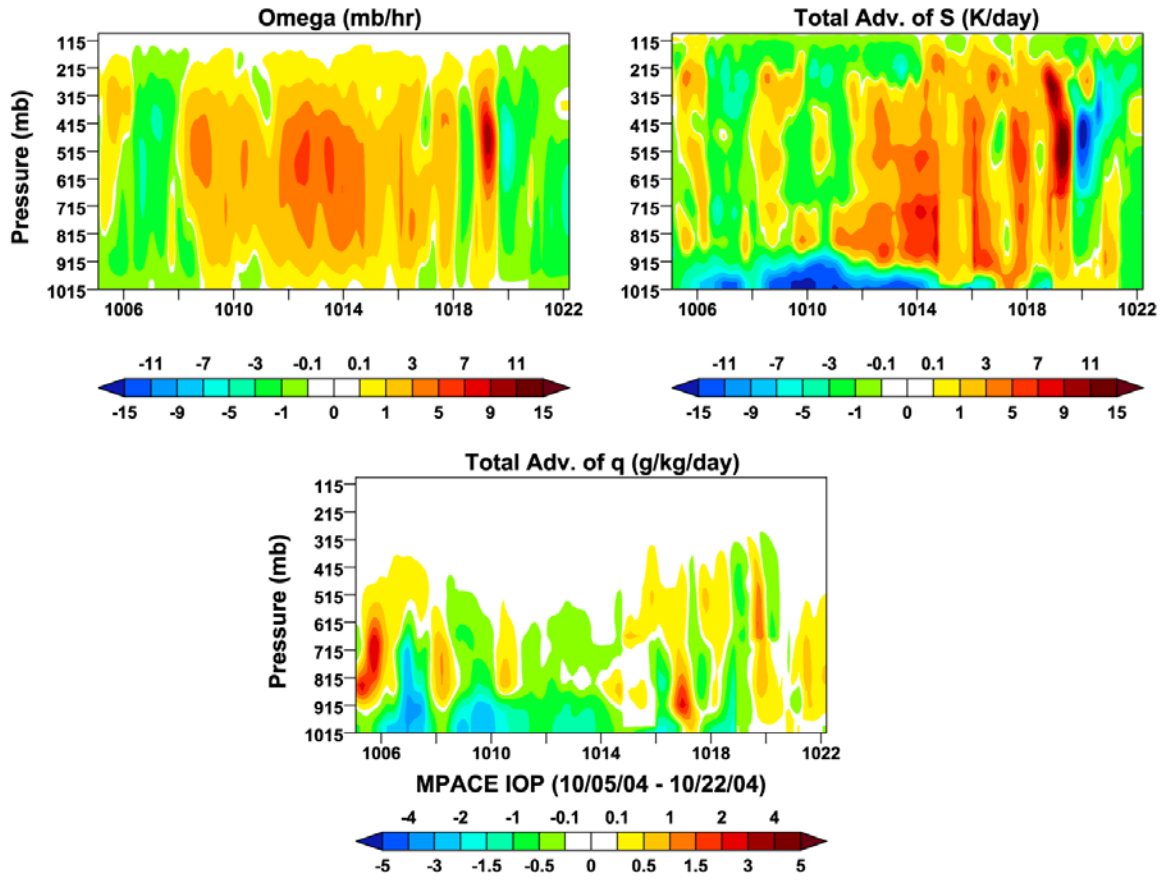


Figure 2. The derived domain-averaged vertical velocity, total advective tendency of dry static energy, and total advective tendency of moisture, from the ECMWF analysis data using the variational analysis method.