



Historical upper air data for future reanalysis projects

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Current reanalysis data sets go back to 1948 at most, which roughly corresponds to the earliest data electronically available in global upper-air data archives. It would be desirable however, to have earlier reanalysis data in order to study climatic variations which occurred during the early twentieth century, including the decade long "Dust Bowl" in the 1930s and dramatic warming in the Arctic from 1920 to 1945, which are poorly understood. Future reanalysis projects have been proposed that will target the entire 20th century. With new data assimilation schemes and increasing computer power becoming available, surface data alone might suffice to yield an acceptable quality up to the middle troposphere, but the quality is likely to be augmented significantly when historical upper-air data is included. In both cases, historical upper-air data will play a key role in the assimilation procedure and, importantly, the independent validation of the assimilated fields.

Although very little is known about operational upper air stations prior to 1948, data exist which can still be found on paper in various meteorological archives. Several projects are now focussing on recovering and reevaluating earlier manuscript upper air observations. We have digitized, controlled, corrected and validated temperature and pressure profiles from aircraft, kite and radiosonde ascents back to 1922. Together with available historical data such as the upper-level winds (TD52 and TD53) from NCAR and data reevaluated by other groups, global historical (pre-1948) upper air data will become electronically available. Although the total amount of data will be small compared to current standards, it will nonetheless be an important contribution to future reanalysis projects and will help to improve our understanding of early twentieth century climate variability.