

Constructing a 21-year (1990-2010), high quality, high resolution dropsonde climatology from field campaigns and special programs

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The principle application of dropsonde data is use in studying and helping predict the path and intensity of hurricanes. Dropsonde use includes, but is not limited to, deployment for specialized field projects, NOAA reconnaissance flights for hurricane forecasting, the NOAA winter storm program, and the United States Air Force dropsonde program. Dropsondes have historically been deployed from aircraft; however in recent years dropsonde use has expanded to include deployment from other platforms as well (such as stratospheric balloons or UAVs). They are most commonly released over oceans, and collect high-resolution (10-20 m) thermodynamic and wind profile data as they descend. Over the last 21 years (1990-2010) NCAR has collected roughly 7500 dropsonde soundings from 37 field campaigns around the globe. Between 1996 and 2010 approximately 20,000 dropsondes were deployed by NOAA's Hurricane Research Division, the United States Air Force and NASA. The primary goal of this project is to compile a comprehensive archive of high resolution dropsonde data, from these multiple agencies, and to apply consistent quality-control in order to produce a high-quality, long-term dropsonde climatology. Processing of these data includes running them through an established set of quality control procedures, and using statistical software for data analysis in order to investigate and resolve special problems that affect data quality. Collaboration with NCAR dropsonde developers will enable us to investigate problems unique to these data sets and take action, where possible, to correct them. Given that majority of dropsonde soundings are collected over oceans or remote locations (such as polar regions) where in-situ upper-air data are scarce, and satellite data have lower vertical resolution, this unique data set will be extremely beneficial for validating satellite and reanalysis data and verifying weather and climate models. Additionally, consistent quality control of this data will facilitate further understanding of hurricane dynamics by providing an opportunity to examine trends and characteristics of environments conducive to hurricanes.