Targeted Observation by Radars and UAS of Supercells 2019 (TORUS_2019) ASOS 1-Minute Data Set

1.0 Contacts

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2.0 Dataset Overview

This data set contains the 1-minute resolution observations from the Automated Surface Observing System (ASOS) network of ~860 stations (Fig. 1) in the contiguous United States. These data were collected and archived by the National Centers for Environmental Information (NCEI; formerly the National Climatic Data Center).

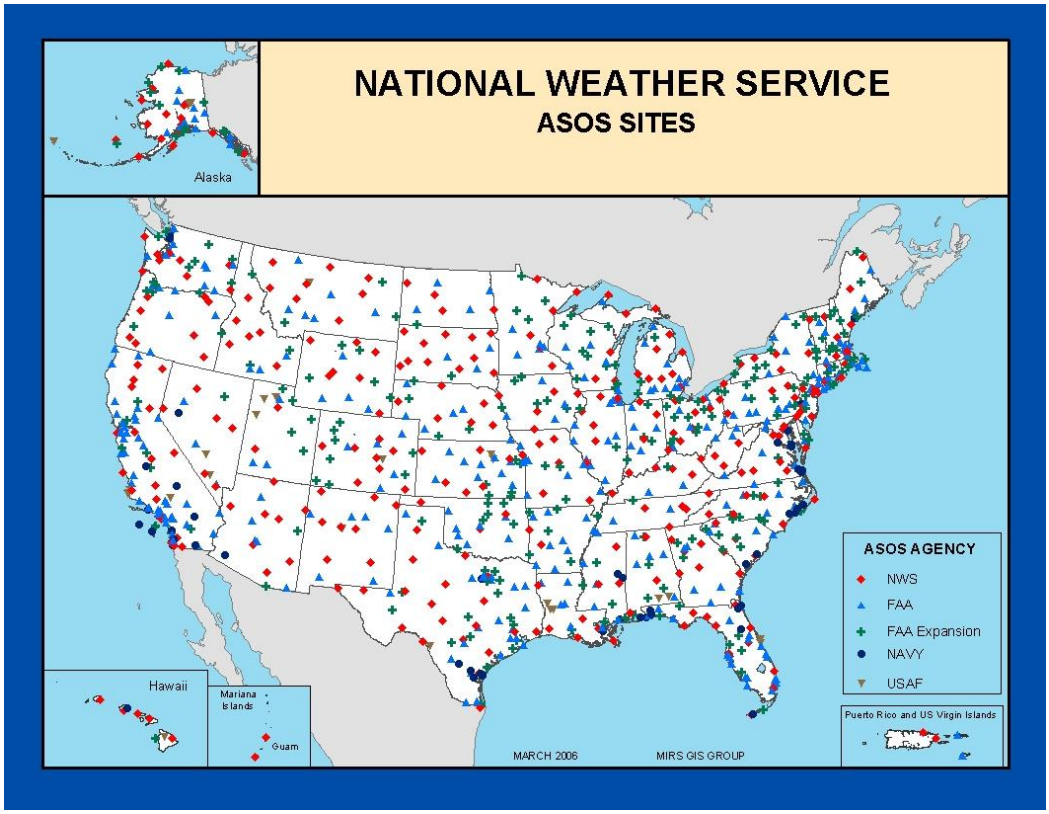

Figure 1. Map of ASOS locations (only those in the contiguous US are included in this data set).

3.0 Project Overview

The **Targeted Observation by Radars and UAS of Supercells (TORUS)** project is a nomadic field campaign during the spring storm seasons (May and June) of 2019 and 2020 over a domain covering much of the central United States where there exists significant point probabilities of tornado-bearing supercell storms. TORUS aims to use the data collected to improve the conceptual model of supercell thunderstorms (the parent storms of the most destructive tornadoes) by exposing how small-scale structures within these storms might lead to tornado formation. These structures are hypothesized to be nearly invisible to all but the most precise research-grade instruments. But by revealing the hidden composition of severe storms and associating it to known characteristics of the regularly-observed larger scale environment, the TORUS project could improve supercell and tornado forecasts. For the 2019 field season the field instrumentation included the NOAA P-3 aircraft, unmanned aircraft systems from the University of Colorado Boulder and the University of Nebraska-Lincoln, Ka band mobile radars from Texas Tech University, the NOAA X-band Polarimetric (NOXP) mobile radar, mobile mesonets as well as a mobile radiosonde and lidar system from NOAA/NSSL. Further information on TORUS is available at the TORUS web site at NCAR/EOL: https://www.eol.ucar.edu/field_projects/torus and information on the TORUS_2019 deployments is available at the TORUS_2019 Field Catalog: http://catalog.eol.ucar.edu/torus_2019.

4.0 Data Format Description

The ASOS data are in two parts, called "Page 1" and "Page 2". "Page 1" (6405 files) contains visibility and wind data and "Page 2" (6406 files) contains precipitation, pressure, temperature, and dew point data. The data are in monthly tar files.

Each tar file contains a file for every station that follows the naming convention:
64050KWST201803.dat
6405 represents the "Page"
KWST is the call sign for the station
201803 is the four digit year and two digit month

The file format for the "Page 1" or 6405 files can be found in the td6405.pdf file that is included with this data set. At the time this readme was created this document was available from NCEI at:
http://www1.ncdc.noaa.gov/pub/data/documentlibrary/tddoc/td6405.pdf

The file format for the "Page 2" or 6406 files can be found in the td6406.pdf file that is included with this data set. At the time this readme was created this document was available from NCEI at:
http://www1.ncdc.noaa.gov/pub/data/documentlibrary/tddoc/td6406.pdf

5.0 Data Quality Control Procedures

These data are provided as is, no quality control procedures were conducted by NCAR/EOL.

Information on the ASOS algorithms and sensor specifications is available in the ASOS_Users_Guide_199803.pdf and ASOS_Users_Guide_Appen.pdf files that are included with this data set. At the time this readme was created these documents were also available from the National Weather Service at:
http://www.nws.noaa.gov/asos/pdfs/aum-toc.pdf
and
http://www.nws.noaa.gov/asos/pdfs/appen.pdf

6.0 References