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## **Displaying Composite and Archived Soundings in the Advanced Weather Interactive Processing System**

**Joe H. Barrett III**

NASA Applied Meteorology Unit / ENSCO, Inc. / Cape Canaveral Air Force Station, Florida

**Matthew R. Volkmer, Peter F. Blottman and David W. Sharp**  
NOAA/NWS / Melbourne, Florida

In a previous task, the Applied Meteorology Unit (AMU) developed spatial and temporal climatologies of lightning occurrence based on eight atmospheric flow regimes. The AMU created climatological, or composite, soundings of wind speed and direction, temperature, and dew point temperature at four rawinsonde observation stations at Jacksonville, Tampa, Miami, and Cape Canaveral Air Force Station, for each of the eight flow regimes. The composite soundings were delivered to the National Weather Service (NWS) Melbourne (MLB) office for display using the National version of the Skew-T Hodograph analysis and Research Program (NSHARP) software program.

The NWS MLB requested the AMU make the composite soundings available for display in the Advanced Weather Interactive Processing System (AWIPS), so they could be overlaid on current observed soundings. This will allow the forecasters to compare the current state of the atmosphere with climatology. This presentation describes how the AMU converted the composite soundings from NSHARP Archive format to Network Common Data Form (NetCDF) format, so that the soundings could be displayed in AWIPS.

The NetCDF is a set of data formats, programming interfaces, and software libraries used to read and write scientific data files. In AWIPS, each meteorological data type, such as soundings or surface observations, has a unique NetCDF format. Each format is described by a NetCDF template file. Although NetCDF files are in binary format, they can be converted to a text format called network Common data form Description Language (CDL). A software utility called `ncgen` is used to create a NetCDF file from a CDL file, while the `ncdump` utility is used to create a CDL file from a NetCDF file. An AWIPS receives soundings in Binary Universal Form for the Representation of Meteorological data (BUFR) format (<http://dss.ucar.edu/docs/formats/bufr/>), and then decodes them into NetCDF format. Only two sounding files are generated in AWIPS per day. One file contains all of the soundings received worldwide between 0000 UTC and 1200 UTC, and the other includes all soundings between 1200 UTC and 0000 UTC.

In order to add the composite soundings into AWIPS, a procedure was created to configure, or localize, AWIPS. This involved modifying and creating several configuration text files. A unique four-character site identifier was created for each of the 32 soundings so each could be viewed separately. The first three characters were based on the site identifier of the observed sounding, while the last character was based on the flow regime. While researching the localization process for soundings, the AMU discovered a method of archiving soundings so old soundings would not get purged automatically by AWIPS. This method could provide an alternative way of localizing AWIPS for composite soundings. In addition, this would allow forecasters to use archived soundings in AWIPS for case studies.

A test sounding file in NetCDF format was written in order to verify the correct format for soundings in AWIPS. After the file was viewed successfully in AWIPS, the AMU wrote a software program in the Tool Command Language/Tool Kit (Tcl/Tk) language to convert the 32 composite soundings from NSHARP Archive to CDL format. The `ncgen` utility was then used to convert the CDL file to a NetCDF file. The NetCDF file could then be read and displayed in AWIPS.

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14. ABSTRACT  This abstract describes work done by the Applied Meteorology Unit (AMU) to add composite soundings to the Advanced Weather Interactive Processing System (AWIPS). This allows National Weather Service (NWS) forecasters to compare the current atmospheric state with climatology. In a previous task, the AMU created composite soundings for four rawinsonde observation stations in Florida, for each of eight flow regimes. The composite soundings were delivered to the NWS Melbourne (MLB) office for display using the NSHARP software program. NWS MLB requested that the AMU make the composite soundings available for display in AWIPS. The AMU first created a procedure to customize AWIPS so composite soundings could be displayed. A unique four-character identifier was created for each of the 32 composite soundings. The AMU wrote a Tool Command Language/Tool Kit (Tcl/Tk) software program to convert the composite soundings from NSHARP to Network Common Data Form (NetCDF) format. The NetCDF files were then displayable by AWIPS.					
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