

General Disclaimer

One or more of the Following Statements may affect this Document

- This document has been reproduced from the best copy furnished by the organizational source. It is being released in the interest of making available as much information as possible.
- This document may contain data, which exceeds the sheet parameters. It was furnished in this condition by the organizational source and is the best copy available.
- This document may contain tone-on-tone or color graphs, charts and/or pictures, which have been reproduced in black and white.
- This document is paginated as submitted by the original source.
- Portions of this document are not fully legible due to the historical nature of some of the material. However, it is the best reproduction available from the original submission.

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.

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
<p>The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p> <p>PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.</p>					
1. REPORT DATE (DD-MM-YYYY) 14-05-2008		2. REPORT TYPE Abstract		3. DATES COVERED (From - To) Jul 2007 - May 2008	
4. TITLE AND SUBTITLE Displaying Composite and Archived Soundings in the Advanced Weather Interactive Processing System				5a. CONTRACT NUMBER NNK06MA70C	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Joe H. Barrett III Matthew R. Volkmer Peter F. Blottman David W. Sharp				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) ENSCO, Inc. 1980 N. Atlantic Ave. Suite 230 Cocoa Beach, FL 32931				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) NASA John F. Kennedy Space Center Code KT-C-H Kennedy Space Center, FL 32899				10. SPONSORING/MONITOR'S ACRONYM(S)	
				11. SPONSORING/MONITORING REPORT NUMBER	
12. DISTRIBUTION/AVAILABILITY STATEMENT Unclassified, Unlimited					
13. SUPPLEMENTARY NOTES					
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.					
15. SUBJECT TERMS flow regime, sounding, Advanced Weather Interactive Processing System (AWIPS)					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 1	19a. NAME OF RESPONSIBLE PERSON Dr. Francis J. Merceret
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (Include area code) (321) 867-0818
	U	U			