

## **P2.2      The Field Systems Operations Center ASOS Dataset Library**

Chester V. Schmitt IV  
National Weather Service, Office of Operational Systems, Silver Spring, MD

### **1. INTRODUCTION**

The Field Systems Operations Center (FSOC) ASOS Dataset Library is a dynamic collection of raw sensor data that has been collected from various Automatic Surface Observing System (ASOS) sites and formatted for use by the ASOS simulator: ASENSE. The purpose of the FSOC ASOS Dataset Library is to thoroughly test ASOS firmware and algorithm improvements, with particular attention being paid to scenarios which stress ASOS algorithms. The FSOC ASOS Dataset Library is organized into cases based on a cadre of meteorological events ranging from clear skies to severe winter storms. Cases generally range in duration from 2 to 8 hours; however there are cases of shorter and longer duration. Each case is made up of a collection of datasets from one or more ASOS sensors. Cases contain 1 to 15 datasets, observations collected from the ASOS for the event, test scenarios and expected results based on the present software baseline. To date, about 80 cases are contained in the library, with more cases being added as they occur.

### **2. PURPOSE**

The software which is used by ASOS to process data from sensor and generate meteorological observations is constantly evolving. Changes in sensor technology, sensor obsolescence, algorithm improvements and the discovery of problems are the primary reasons why the ASOS software needs to change. Each time a new software load is created and is to be implemented, the National Weather Service subjects the software load to vigorous testing. This testing is designed to determine if the software is stable and that the output from the ASOS algorithms is correct. Despite the rigorous testing, occasionally problems lie undiscovered. These problems then come to light after the software has been deployed across the entire ASOS network, which contains nearly 1000 sites.

These kinds of problems often result in data loss or erroneous data. Since ASOS data is vital to aircraft operations, as well as weather forecasting and the climate record, any way to improve the odds of discovering and then correcting a problem in the ASOS software prior to deployment is vital. One such way is by making use of the ASOS Dataset Library during testing.

The ASOS Dataset Library contains sensor data collected from numerous ASOS sites during real meteorological events. Raw sensor data collected from ASOS sensors is put into datasets which can be used ingested by ASOS software in the same manner in which data would be ingested from the sensor itself. With the ASOS Dataset Library, regression tests can now be developed which will use real world data to test the performance of the algorithms, particularly at algorithmic "break points". Since any algorithm can be tested, a custom set of regression tests can be developed in order test the specific aspects of the software being modified. When used in conjunction with the user-input style testing performed now, more comprehensive testing of software loads is now possible. This will increase the odds of discovering and correcting problems prior to full deployment.

### **3. CURRENT STATUS AND FUTURE WORK**

Currently, there are 80 cases, or collections of sensor datasets, in the FSOC ASOS Dataset Library. However, the Dataset Library is dynamic, and cases are being added all of the time. It is out goal to have 250 cases by the end of 2010.

### **4. ACKNOWLEDGEMENTS**

The author wishes to thank Richard Parry for his contribution to the development of the ASOS Dataset Library. The author would also like to thank Joe Facundo and David Mannarano for their guidance and support.

The views expressed are those of the author and do not necessarily represent those of the National Oceanic and Atmospheric Administration.

---

*Author address:* Chester V. Schmitt IV, National Oceanic and Atmospheric Administration, 1325 East West Highway, Silver Spring, MD 20910, e-mail: chet.schmitt@noaa.gov.