IEM Data Acquisition v0.4

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Introduction

This document describes the data acquisition procedure for the Iowa Environmental Mesonet (IEM hereafter). The IEM server does not collect initial observations, rather it is feed data from various sources on the Internet. This document will explain where and when the data products arrive at the IEM server. Consult future documents concerning data storage and display.

As of 5 October 2001, the IEM project was collecting data from the following sources

1. Automated Surface Observation System (ASOS hereafter) & Automated Weather Observation System (AWOS hereafter)
2. Roadway Information System (RWIS hereafter)
3. Iowa State University Ag Climate Network (ISUAG hereafter)
4. National Weather Service Cooperative Observers

Data Sources

1 ASOS/AWOS

Currently the IEM server receives ASOS/AWOS observations from the Internet Data Distribution (IDD) made available by the University Cooperation for Atmospheric Research (UCAR - UNIDATA). The IDD is a system for distributing data in a tree-like fashion to sites on the Internet. The ASOS/AWOS data is placed on the IDD off of NOAAport downlink stations.

A concern for this system is latency of the data arriving at the IEM server. UNIDATA maintains a monitor of the IDD performance, latency charts can be viewed at http://www.unidata.ucar.edu/projects/idd/status/idd/fosTopo.html . A certain amount of redundancy is also built into the system by having multiple feed-sources on the IDD and multiple machines injecting data into the IDD.

The data itself is decoded from the METAR format into a GEMPAK surface file. This surface file is then the source for the applications running on the IEM server.

2 RWIS

The RWIS data is made available on the Iowa DOT ftp server 4 times an hour. The files arrive at their server every 15 minutes beginning at 3 minutes after the hour. The download scripts on the IEM server thus run every 15 minutes beginning at 5 minutes after the hour. The timing scheme has worked nicely thus far. There are still issues with the completeness of the data made available on the Iowa DOT server.

3 ISUAG

The ISUAG data is sent to the IEM server by the High Plains Climate Center (HPCC). HPCC performs all of the QC/QA. HPCC sends a data file to the IEM server at roughly 11 UTC. The data file contains information for the local yesterday. The data is broken up into hourly observations and daily summaries.

4 NWS COOP

The National Weather Service (NWS) maintains a loosely knit network of cooperative observers. These observers routinely report information sometime in the morning. Their observations are gathered together by local Weather Forecast Offices (WFO) and disseminated out via NOAAport and unto the IDD network.

The primary concern for this network is the consistency of daily observations and the timing of the observations reported to the NWS. Some reports are reported at 12 UTC, while other reports are 7 A.M., while other reports are when the observer wakes up in the morning!

The quantity of reporting stations per day seems to be proportional to the activeness of the weather! While this is good for active weather situations, it makes building climatologies difficult.

Summary

The goal of the data acquisition logic is to save observations that are taken at a comparable time. Since the ASOS/AWOS observations are generally fixed at :53 after the hour, the advantageous RWIS data would be valid for a time close to :53 after. The AWOS data in Iowa arrives at least three times per hour, so matching the AWOS data with the RWIS data is desired as well. Unfortunately, the ISUAG observations take a day to make it to the IEM server, so their use in real-time data is nominal.

Data	Ob Time	Arrive at IEM
ASOS	:53 After	by :10 after
AWOS	:53 After	by :10 after
RWIS	Variable	:5 :20 :35 :50 after

Table 1: Data Acquisition of Current Data