JP1.8 The Iowa Environmental Mesonet – Observing climate at the mesoscale

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1. INTRODUCTION

The Iowa Environmental Mesonet (IEM) (Todey et al. 2002a) is an effort to coordinate the collection, archival, and dissemination of environmental data from numerous existing sources. The IEM has achieved some initial goals toward improving the access to weather and climatological data for the state of Iowa. A data server has been developed for acquisition, archival, processing, display and dissemination of environmental data. It has allowed the compilation of existing data from the state to be collected in a single archive and to begin developing products for use in real-time (http://mesonet.agron.iastate.edu). It has also been successful in getting different governmental organizations communicating about and sharing data.

2. EXISTING NETWORKS

Iowa has a wide variety of detailed data from various sources. Existing systems currently include over 400 stations (Table 1) and over 1600 instruments within the state.

Table 1. Existing stations by agency

Observing System	Number of Stations
National Weather Service ASOS	15
Iowa DOT AWOS	33
Iowa DOT RWIS	50
Iowa State University Ag-Climate	12
USGS/USACOE	149
National Weather Service COOP	169
Local School Sites	34

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The individual networks are autonomous with no coordination in siting or data format. The initial goal of the IEM has been to integrate existing data into a single collection point and data archive. The next goal is data compatibility (Todey et al. 2002b) and quality control. The IEM is taking an approach in network development that differs from the Oklahoma Mesonet (Brock et al. 1994) and the proposed Texas Mesonet, by building on data from existing networks. By capitalizing on existing resources, the state demonstrates efficiency through cooperation among agencies.

3. CLIMATOLOGICAL USE

The current data structure allows for good spatial and temporal detail in real-time (Fig. 1) to indicate mesoscale features.

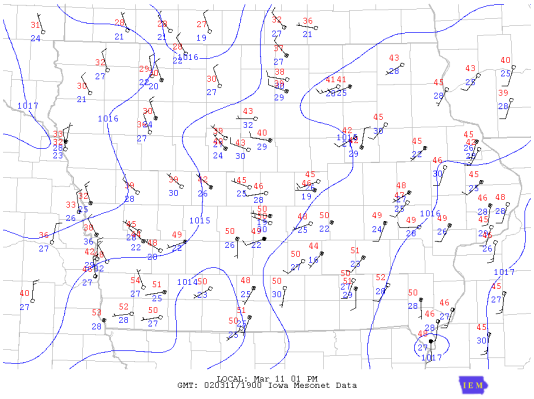


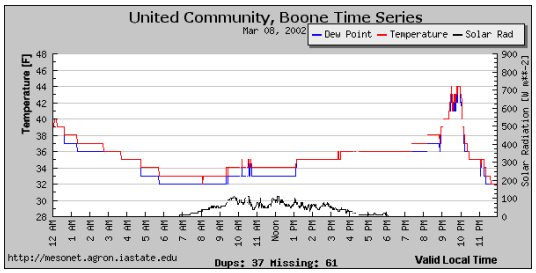
Fig. 1 IEM current data plot of a cold frontal passage. Not all stations are shown due to station density considerations.

The climatological use is somewhat in question because of a lack of continuous data for some sites. Some automated stations in the state have been in place for nearly 10 years with an archive available. The Automated Weather Observing Stations (AWOS) of the Iowa Department of Transportation have up to a 10 year archive of 1 minute data.

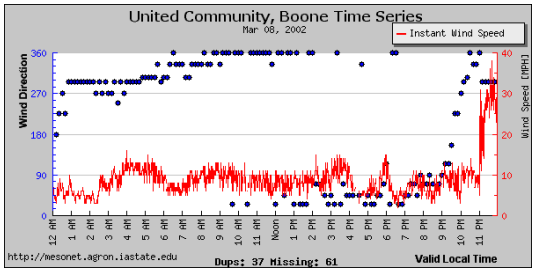
This archive is being tapped to enhance the spatial density of the climatological aspects of the IEM.

This archive is doubly useful since it is a one-minute archive. This one minute archive data of the AWOS are being included with a non-standard high-temporal density network to create a high temporal and spatial detailed archive of data. Stations at local schools are being sponsored by a local TV network. While the siting is non-standard, the stations provide real-time access to 1 minute temperature, dew point, wind, solar radiation, barometric pressure and rainfall (Fig. 2).

a.



b.



c.

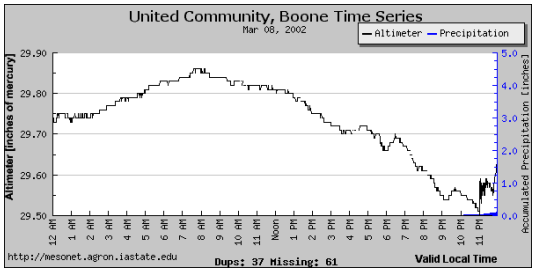


Fig. 2 One minute temperature, dew point and solar radiation (a), wind speed and direction (b), and altimeter and rainfall (c).

The temporal density of the IEM archive is also being improved by these stations and provides a unique climatological archive for data analysis and comparison.

These stations additionally help fill automated station gaps in certain areas, especially lightly populated areas in the western parts of the state,

4. CONCLUSIONS

One success of the IEM has been to get different data owners and data users talking about sharing of data to improve the meeting of data needs. As more data is collected and archived, further work on climatological aspects of the IEM will be developed.

7. REFERENCES

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