

Using GIS to serve Environmental Data in Iowa

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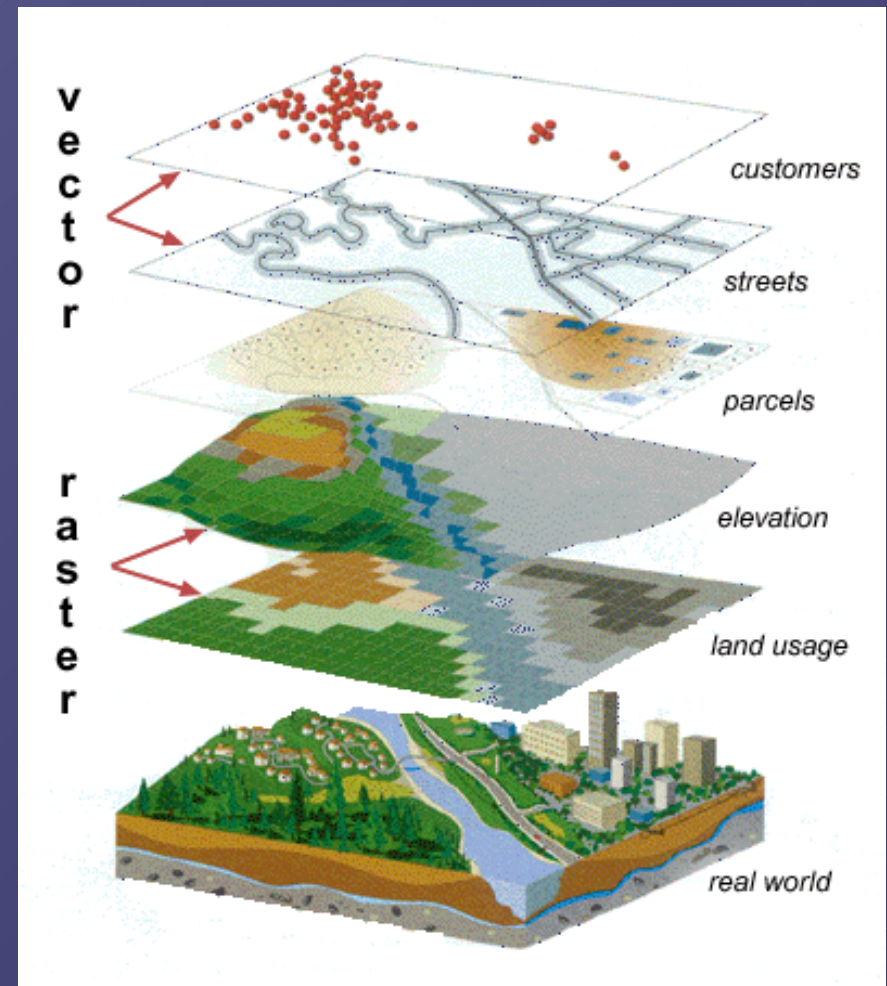
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Outline

- What is GIS?
- Why use GIS?
- Who uses GIS?
- How the IEM utilizes GIS?
- Where are we going with GIS?
- When will I stop talking?

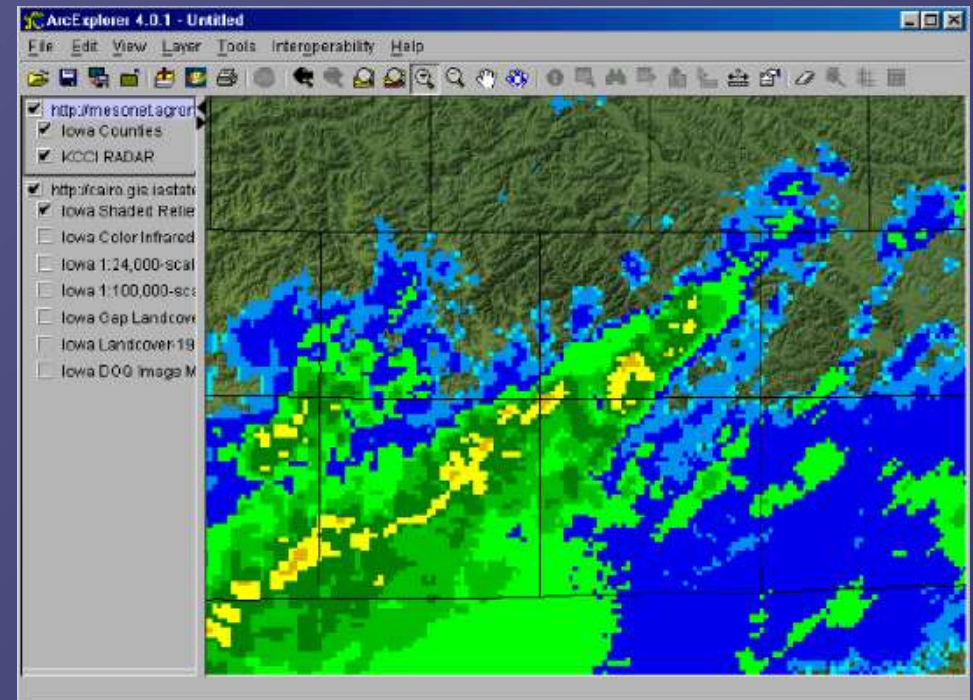
What is GIS?

- **a GIS is a system** of hardware, software and procedures to facilitate the management, manipulation, analysis, modeling, representation and display of georeferenced data to solve complex problems regarding planning and management of resources (NCGIA, 1990)



Why use GIS?

- Interface with many datasets
- Interface with many disciplines
- Tools to do 'portable' research



RADAR layer from the IEM
with topography from ISU GIS Lab

Who uses GIS?

- Most of you probably do
- Just about everyone else does too!
- GIS framework moving into non-spatial areas.



How the IEM uses GIS?

- PostGIS, spatial blade for PostgreSQL
- Mapserver, Internet Mapping Server
- GRASS, desktop GIS

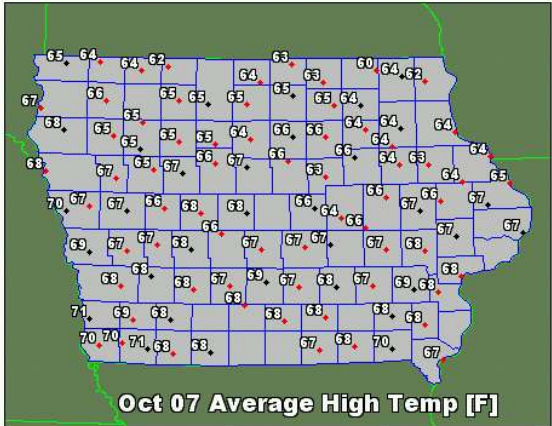


Internet Mapping Example

- Generate dynamic plots of climate data
- The data for the plot is immediately available in GIS format for download.

COOP Climate Data

Using the COOP data archive, daily averages and extremes were calculated. These numbers are **not** official, but we believe them to be accurate. Please make your form selections on the left hand side and then click the 'Generate Plot' button. **Note: This database does not contain 2002 data yet.**



Oct 07 Average High Temp [F]

You can right-click on the image to save it.

- Only one year with the record value is shown, there may have been more.

Display Area:
Iowa

If you select a sub-region, the year of a record event will appear as well.

Select Parameter:
Average High Temperature

Select Date:
Month: October Day: 7

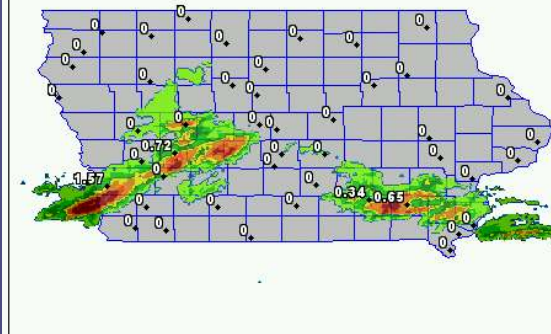
Generate Plot

Download Options:
GIS READY! [shp](#), [dbf](#), [shx](#)

Map Information:
The black and red dots signify the climate record for the station. Sites in black date back till 1893 and sites in red to 1951.

Analyzing Rainfall

- Combine NEXRAD estimates with automated observations.
- All data shown is immediately available for download.



You can right-click on the image to save it.

Display Area:

View a Region of
Iowa:

Iowa

Select a County in
Iowa:


Select County

Select Time (GMT):

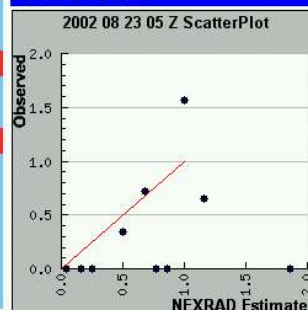
Currently, only data between 15 April 2002 and 1 Nov 2002 is available in this system

Month: Day: Hour:

Download Options:

 [Rainfall image](#), and [world file](#). (This image is in geographic coordinates.) A [shapefile](#) also exists with the precip observations included.

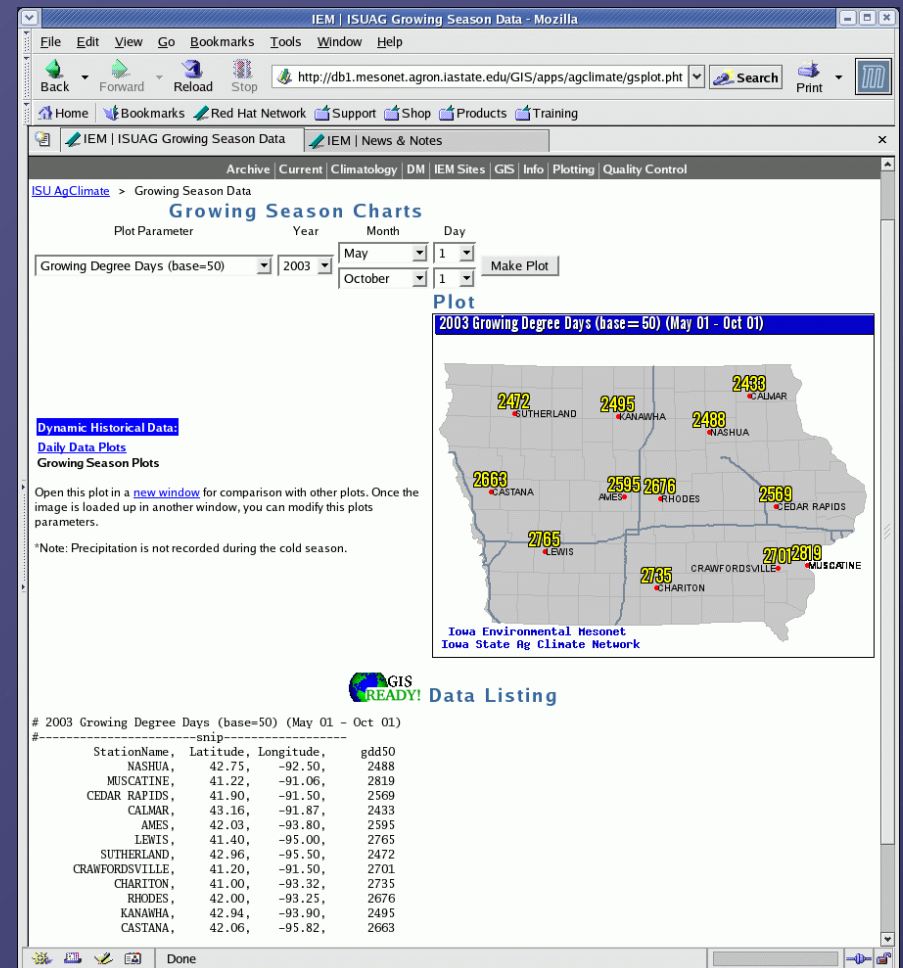
Scatter Plot:



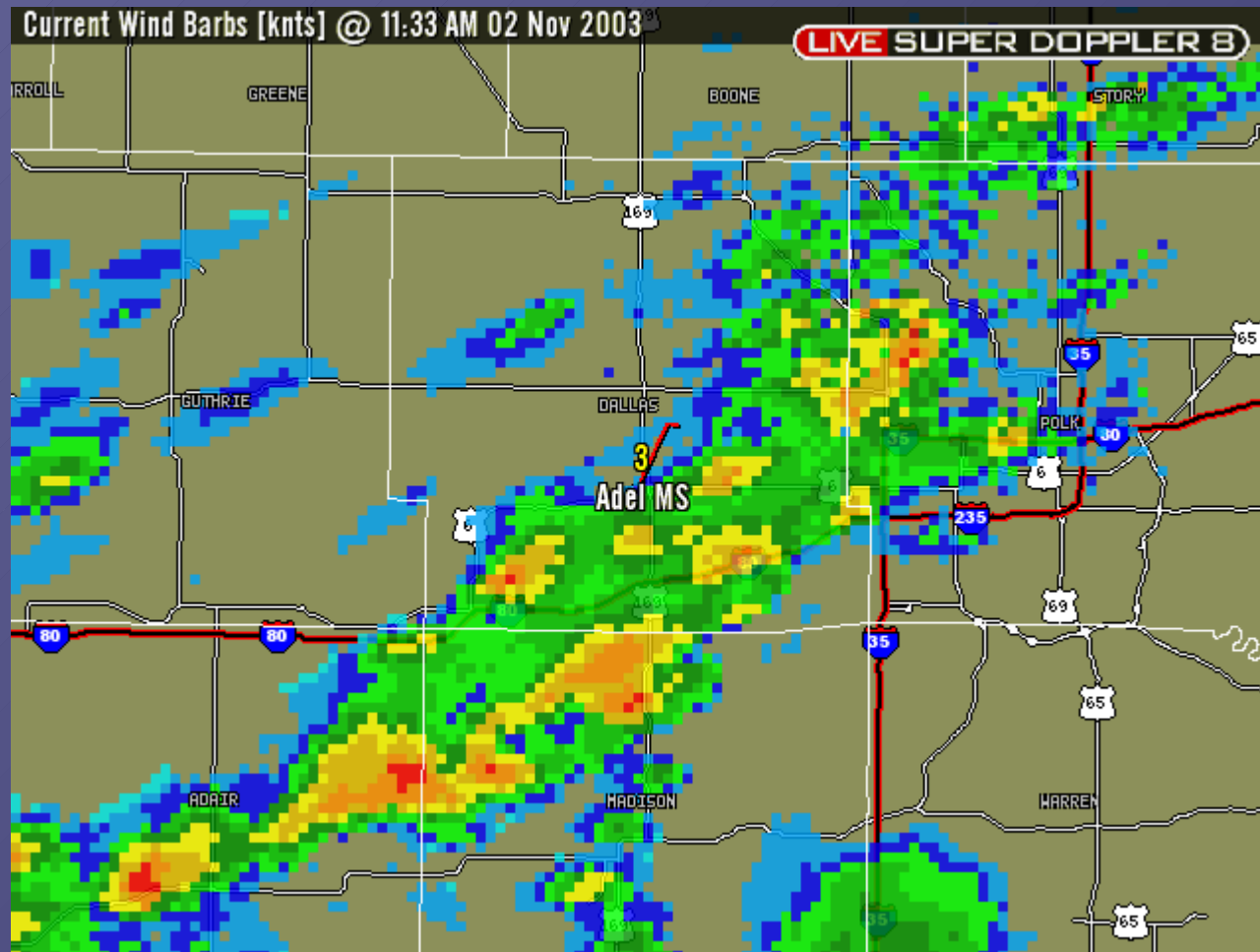
Raw Precip obs (inches):				
Key: Obs Larger NEX Larger				
ID:	Station:	Ob:	NEX Est:	Ob - NEX
AIO	ATLANTIC	0.00	0.77	-0.77
AWG	WASHINGTON		0.86	-0.86
ADU	AUDUBON	0.72	0.68	0.04
BRL	BURLINGTON	0.00	0.04	-0.04
CIN	CARROLL	0.00	1.86	-1.86
CBF	COUNCIL BLUFFS	1.57	1.00	0.57
DNS	DENISON	0.00	0.25	-0.25
HNR	HARLAN	0.00	0.25	-0.25
FFL	FAIRFIELD	0.65	1.16	-0.51
IKV	ANKENY	0.00	0.16	-0.16
TNU	NEWTON MUNI	0.00	0.25	-0.25
OTM	OTTUMWA	0.34	0.50	-0.16

Custom Growing Season Data

- Typical growing season data does not fit actual planting dates.
- Users pick timespan and parameter.
- Data immediately available for Excel or GIS in CDF format.



Pulling RADAR into GIS




OGC Web Services

- Open GIS Consortium (OGC) develops standards for GIS systems to inter-operate
 - Web Map Service (WMS)
 - Web Feature Service (WFS)
- Dynamically bring in Ortho Quads from the ISU GIS Lab
- All generated with Open-Source software and Open GIS standards

Map Type:

DECORAH



0 0.4 mi

Zoom Level: (near) 1 2 3 4 5 6 (far)

Note: While the white dot marks the location of our latitude and longitude measurements, the actual station location could be anywhere within the limits set by the white box. Depending on the accuracy of the location measurements, it is feasible that the actual station location is outside the box.

Image Generation provided by Iowa State GIS lab

GIS Data Services Available

- Today's NWS COOP observations
- Climate data
- Station locations
- Current & Historical RADAR composites
- Various WMS services
- High resolution rainfall (coming soon)

Where are we going with GIS?

- Expand our Web Map Service (WMS) and Web Feature Service (WFS).
 - Currently have a RADAR WMS
 - Will have a WFS before next year
- See how we can get weather and climate data to the GIS community in a Free/free and open matter.

When will I stop talking?

NOW!,
but I will start again
after the break!

I'm done, questions?
<http://mesonet.agron.iastate.edu>



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