GIS and the National Weather Service

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**GIS and the National Weather Service**

- **What is GIS?**
  - A Geographic Information System (GIS) is a database system with software that can analyze and display data using digitized maps and tables for planning and decision-making. A GIS can assemble, store, manipulate and display geographically referenced data, tying this data to points, lines and areas on a map or in a table.
  - It's a **MAP** associated with a database (with pictures) created with computer technology.
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- Why relate weather data via GIS?
- How long have meteorologists drawn weather maps?
  - The days of the grease pencil are long gone
  - Fax machines are no longer the manner in which we disseminate charts
- Computers can make our lives easier (Really!)
  - The amount of data we're dealing with is growing at an accelerated rate
  - Data base technology does a good job of managing massive datasets
  - Graphics capabilities have become more refined
- The Web has revolutionized how we distribute weather information
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- Web delivery of weather data is now the norm, along with conventional means (TV)
- Every WFO has a homepage
  - Every WFO has a webmaster!
- WFOs and RFCs have a variety of projects capitalizing on Internet technology

Why?
- Provide the best product
  - To the Nation
  - To the Public
  - To enhance public safety by providing timely, accurate information
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- Most products are rendered using ESRI-compatible data formats (shp)
- Not all the shapefiles are readily available
- XML and RSS can help
- OGC standard web services can help
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Moving the Data

- RSS and XML
  - Provide data feeds of forecasts, watch/warn, etc
- Web services
  - Open Geospatial Consortium
    - Consortium of Industry, Government and Academia
    - Goals include creating an environment for cross-platform data sharing
    - Working groups active in a variety of areas
    - Specifications are gaining international recognition
      - Web Map Service
      - Web Feature Service
      - Web Coverage Service
Experiments with XML

- XML – a markup language, similar to HTML, designed to aim machine/computer processing of data
- Tests in two formats based in XML:
  - Common Alerting Protocol (CAP)
  - Really Simple Syndication (RSS)
- Tests include TPC/NHC products, NWS Watch/Warnings

http://weather.gov/alerts/

Currently only over Internet, but possible dissemination via NOAAPORT

Overall positive feedback

http://www.nws.noaa.gov/alerts/
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Academic Products

- Early adopters
  - Iowa Environmental Mesonet
    - http://mesonet.agron.iastate.edu/
  - Texas Mesonet
    - http://mesonet.tamu.edu
- Simultaneous adopters (ca. 2001)
- Possibly the first to use GIS services to display (near) realtime weather data
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Weather Forecast for Saturday, January 08, 2005
DOC/NOAA/NWS/NCEP/Hydrometeorological Prediction Center
Prepared by Bell/Oravec based on HPC, SPC, and TPC forecasts.
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SPC

http://www.spc.noaa.gov/compmmap/
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SPC

With the exception of the national sector, the three sub-sectors will change as SPC forecasters.
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Graphical Warnings

Cooperative effort between WFO Ft Worth and NCTCOG
• NWS provides Level III radar data
• NCTCOG provides census and population density data
• NCTCOG parses warnings and displays county warnings
• Successful partnership between NWS and local government/agency
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Model Graphics

- Accurate map registration provides better representation to the user.
- Animated graphical representations enhance user experience.
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Model Verification
Incorporating additional data via layers, such as county boundaries, rivers, highways and topography enhances user awareness of weather phenomena in their vicinity.
GIS and the National Weather Service Agency/Academia Partnering

National Polygon Warning Test

NWS National Polygon Warning Test Data

This page automatically updates every 6 minutes.
Radar data are updated every 5 min.
Radar mosaic is derived from Level III data.

Click here for hourly data in text format.
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Hydrology – Flood Climatology
GIS and the National Weather Service
Aviation Services
GIS and the National Weather Service Aviation Services
GIS and the National Weather Service
Supporting Storm Spotters and EM's

- Texas A&M offers a WMS feed of CONUS Level II imagery for WinAPRS, UI-View and Xastir users
- 1. If you need more info, contact n5jxs@tamu.edu
- 2. If the above names are foreign to you, talk to your ham radio spotters about APRS and its potential uses in spotting
- 3. I know the names are strange. So are Hams. But at least we know we are!
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Radar Composites

Hurricane Ivan Radar Composite  040915/2000
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Radar Site Depictions
Texas Mesonet represents data using GIS formats

Data available via OGC Web Services
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Where to go?

  - List of experimental products and websites
- http://www.spc.noaa.gov
  - Severe weather GIS products/imagery
- http://mesonet.tamu.edu
  - (coming soon: How-To link)
  - http://mesonet.tamu.edu/currentwx.html
    - WMS, WFS data available
  - http://mesonet.tamu.edu/products/radar/LevelII.html
    - Radar products site (mostly Texas, Florida)
    - More coming
- http://mesonet.tamu.edu/L2radar.html
  - Level II radar mosaic
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Polygon Warnings

- Polygon Warning evaluation commenced 1 MAR
- Graphical warning pages by NWS PRH
  - http://www.prh.noaa.gov/regsci/gis/
- Graphical warning pages by Texas A&M
  - http://mesonet.tamu.edu/PolygonTest/
- Both pages represent the same data
- Each page uses a different method to acquire the data and render the webmap
GIS and NWS
GIS and WEATHER!

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Questions?