



# A Web Map Service for Display of Real-time Satellite Products

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# Outline

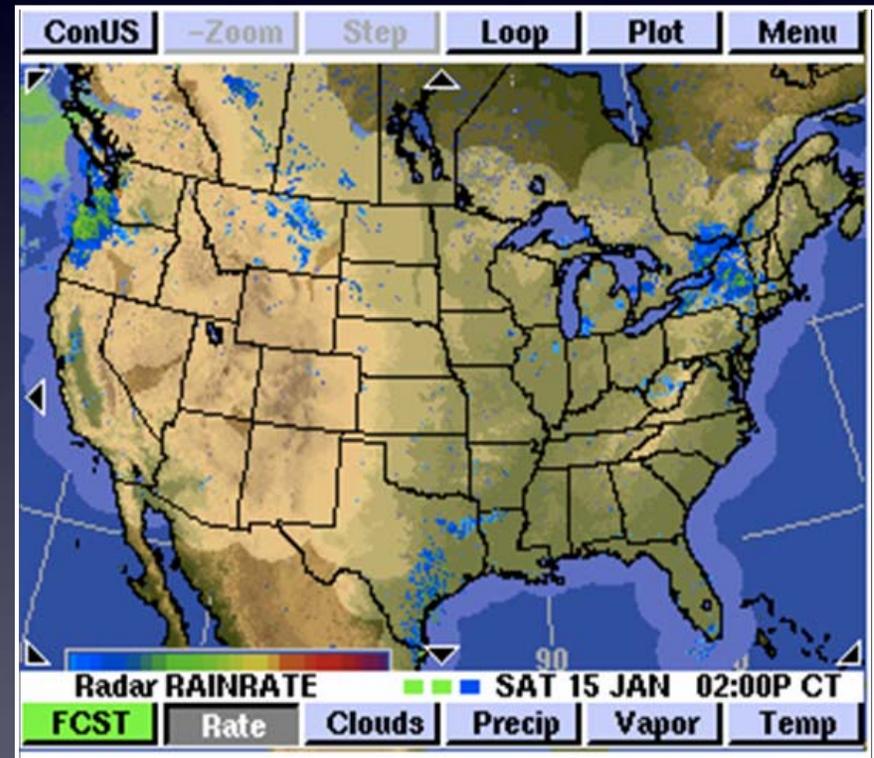
- Personal Advanced Weather (PAW)
- Web Map Service (WMS) with enhancements
- Standard real-time weather products
- Satellite Nowcasting and Aviation Application Program (SNAAP) products
- Additional products
- Native smart phone apps

# PAW



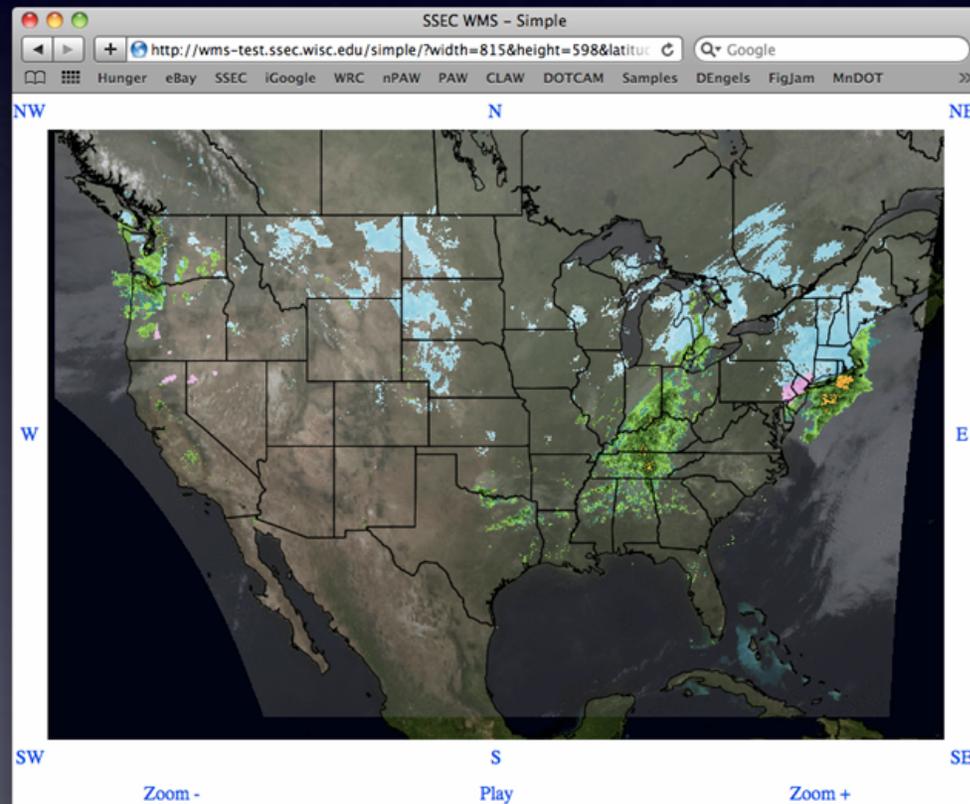
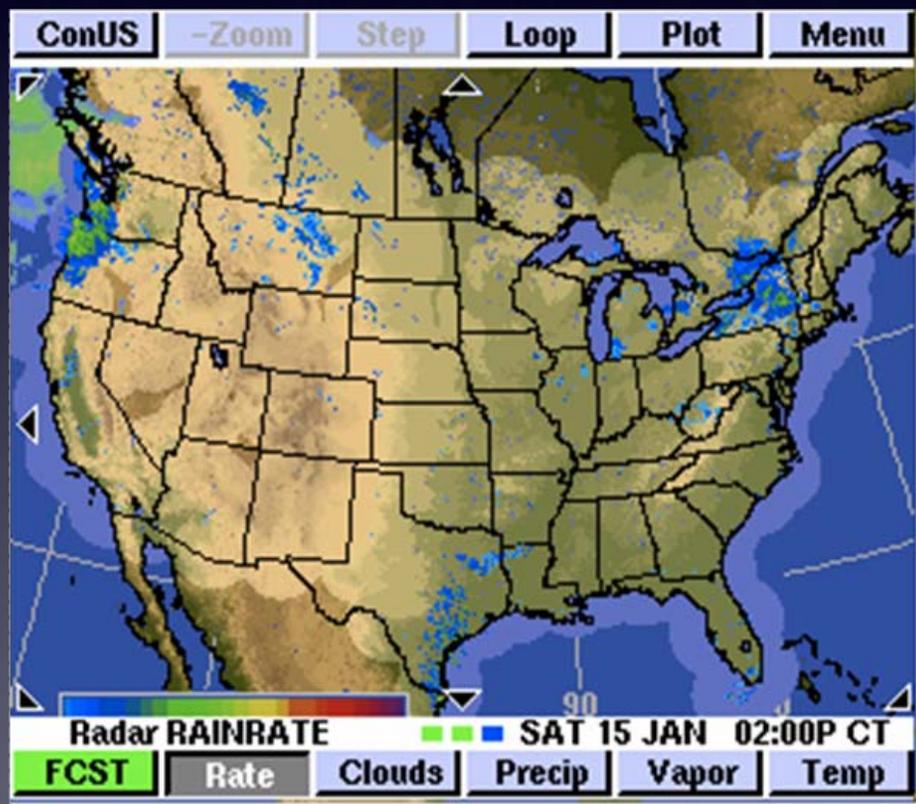
## Personal Advanced Weather

- Previously known as:  
PDA Animated Weather
- Designed for use on any web-enabled phone; also Google Gadget
- Access to real-time weather data and products
- Poor-man's animation, zoom, roam



# PAW

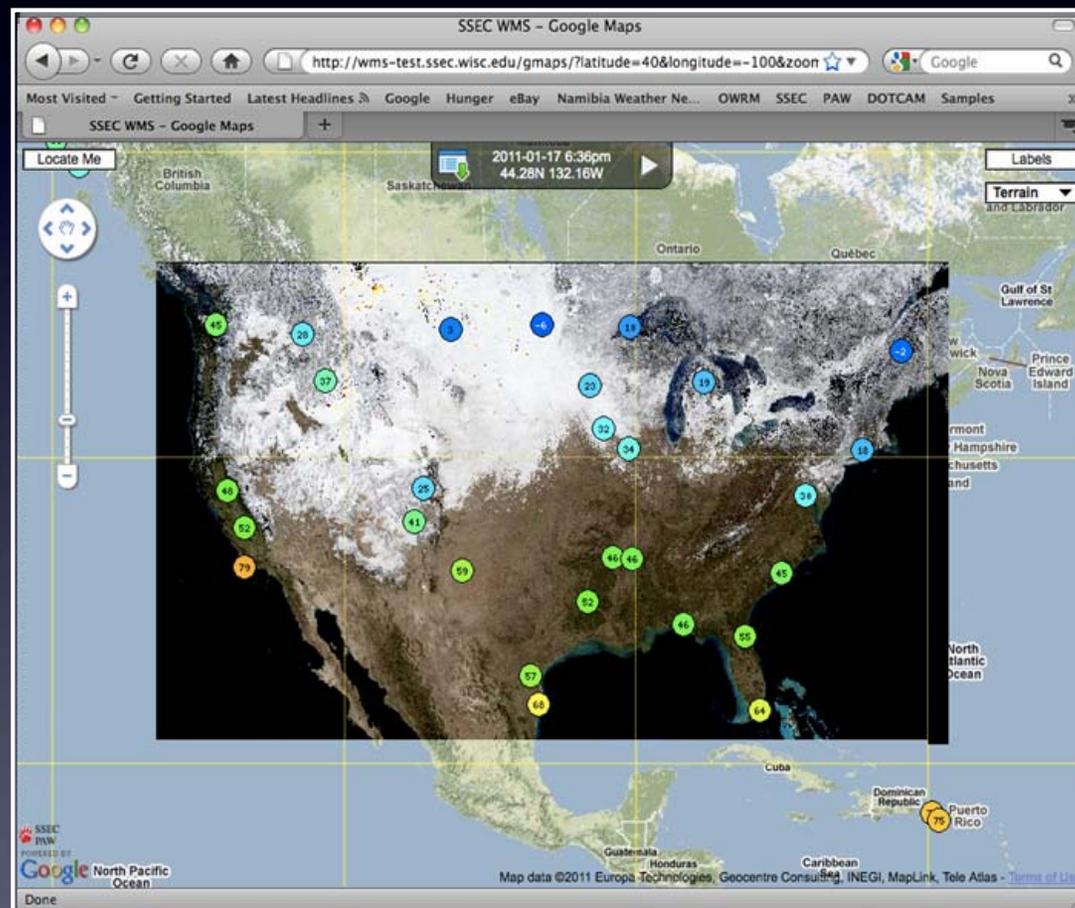
## Current vs New



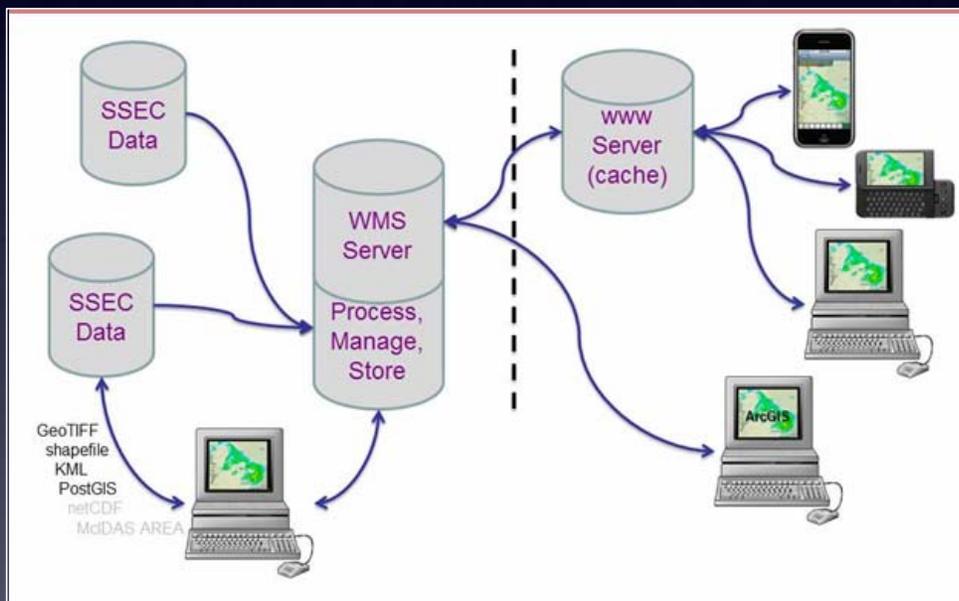


# Web Map Service

- Open Geospatial Consortium (OGC) standard
- Digital image of geographic information
- URL-based addressing
- Independent of visualization
- Variety of display clients



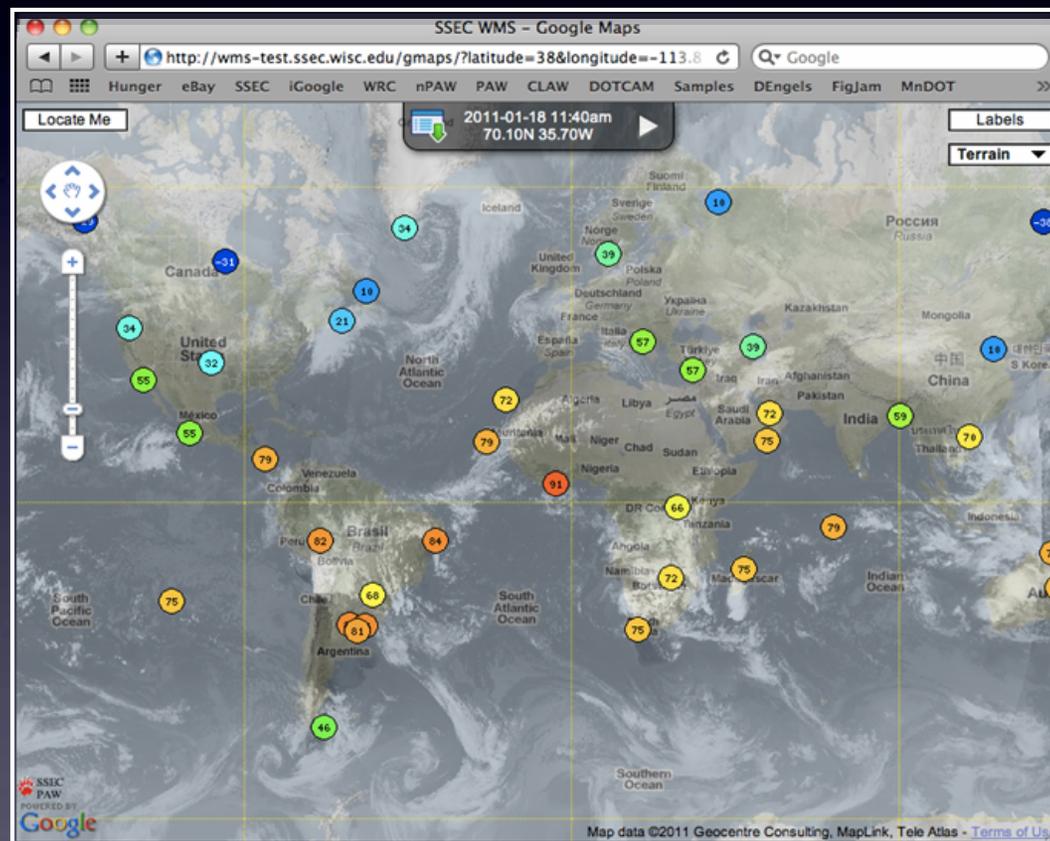
# Geo Web Services Goals



- Develop extensible map server and tools
- Allow scientists to easily share data in web-based geospatial formats
- Take advantage of new mobile client platforms

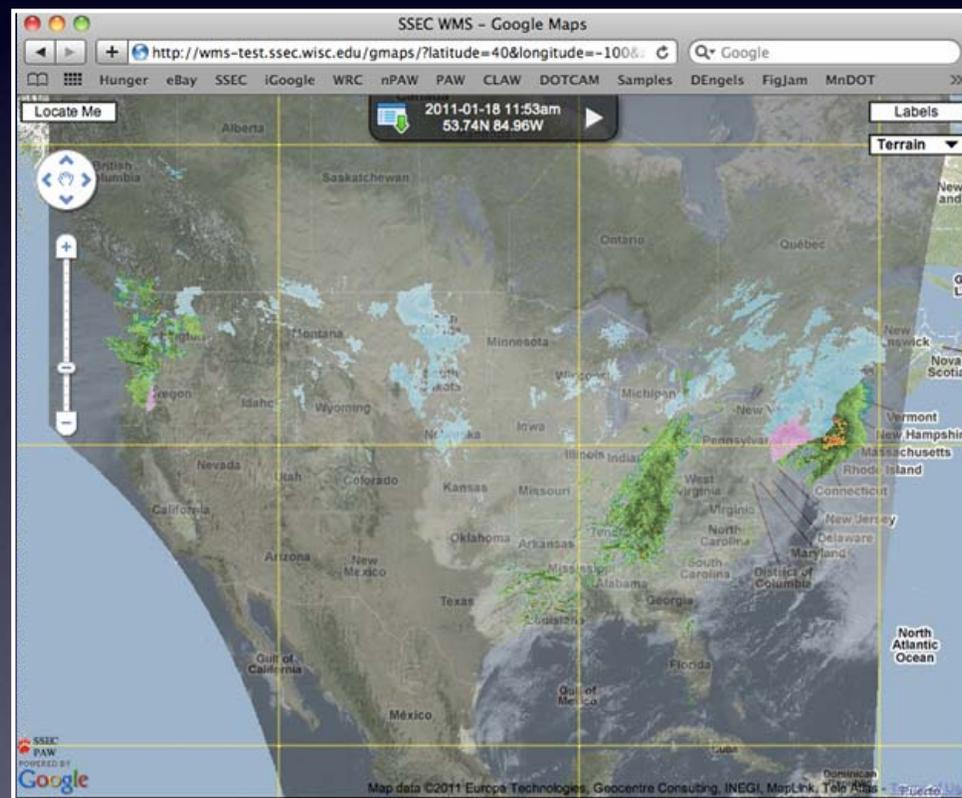
# WMS Features

- Dynamic roam and zoom
- Product compositing
- Transparency
- Scales output to client display size
- Tile caching



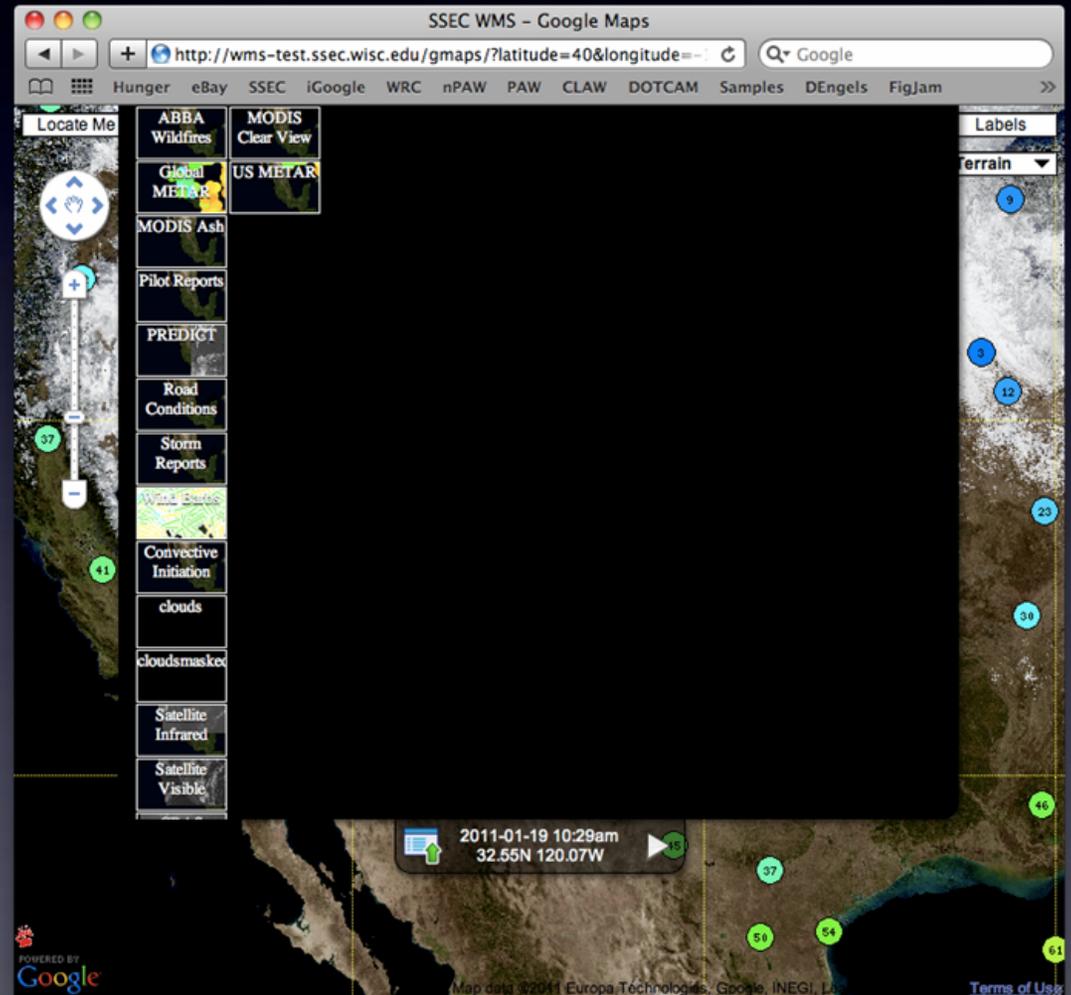
# Enhancements to WMS

- Product Ingest Manager
- Product Interface
- Animation
- Graphic overlay (polygons, contours, and text)
- Tile pre-caching



# Product Manager

- Listing of available products
- Drag and drop to create overlays
- Transparency
- Overlay



# Animation Control

- Adapts to varying temporal resolutions
- Transitions from current to future displays
- User configurable loop controls

## Example URL

?products=product1,product2,product3&timespan=-2h,1h&timestep=1h&timebuffer=0,30m

Variable	Description	Default	Value
time	Anchor date and time for animation	[Current time]	2011-01-11 13:35
timespan	Animation time span around anchor	-1h,0	-2h,1h
timestep	Time step for each animation frame	15m	1h
timebuffer	Buffer time added to product start and end	0,1h	0,30m
timerange	Use the given absolute time range		
timeproduct	Use absolute product times for animation		

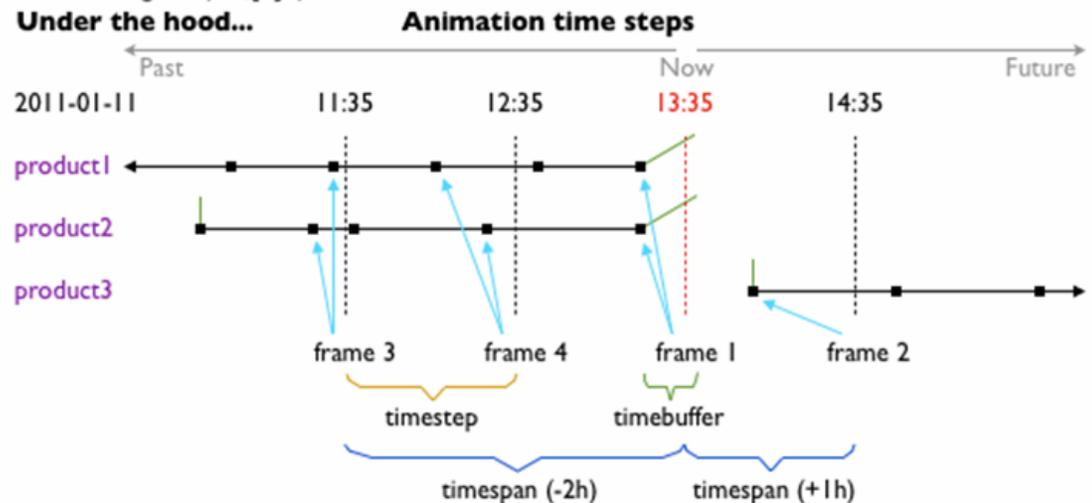
## Formats

Absolute time: YYYY-MM-DD hh:mm[:ss]

Relative time: [-][0-9][w|d|h|m] (weeks, days, hours, minutes)

Relative range: -before,[+]after

## Under the hood...

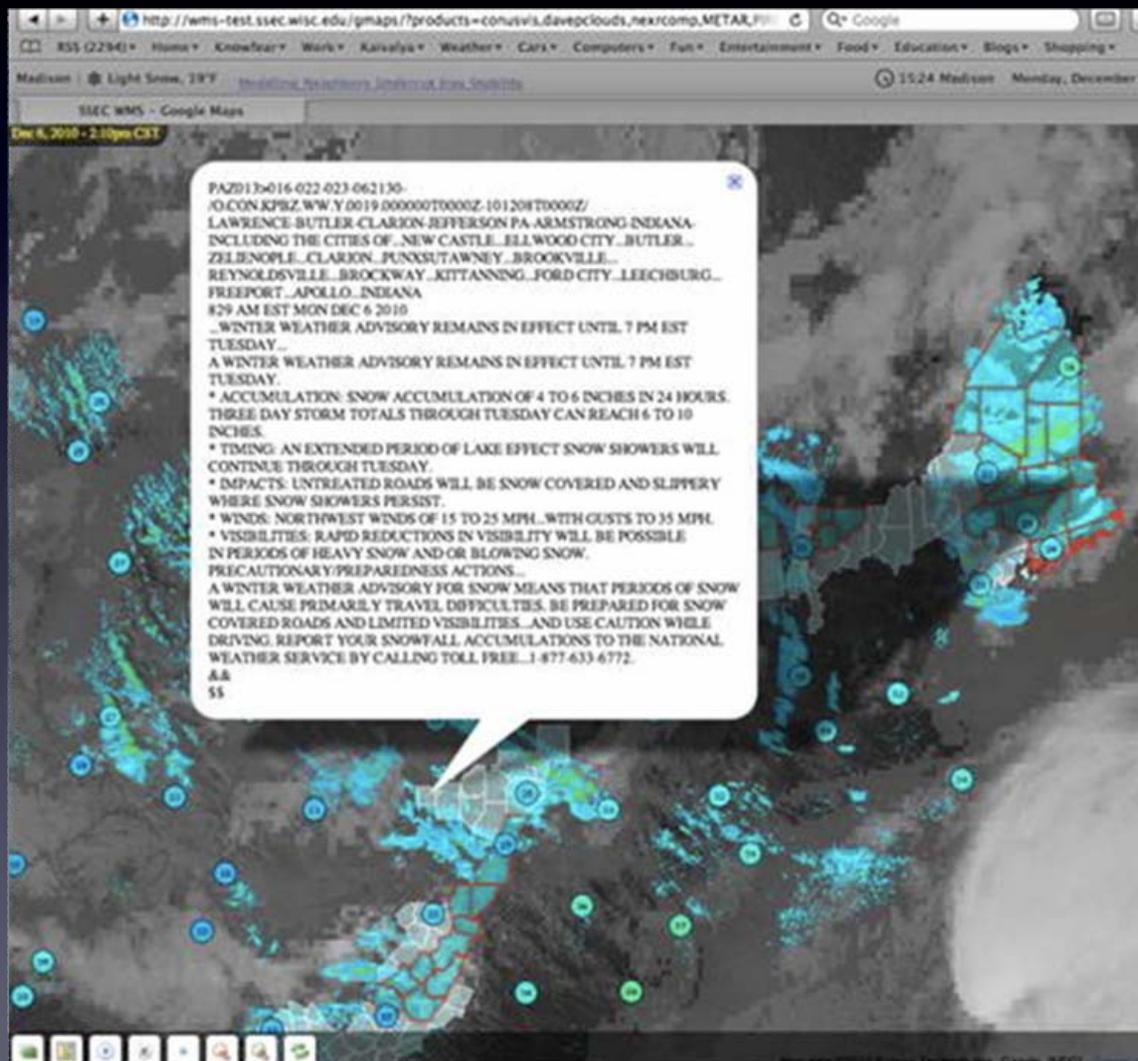


# Graphic Overlay

- Support for KML and shapefiles
- PostGIS backend
- PHP “handlers” for popups
- Clickable



# Desktop Browser



# Mobile Devices



iPhone

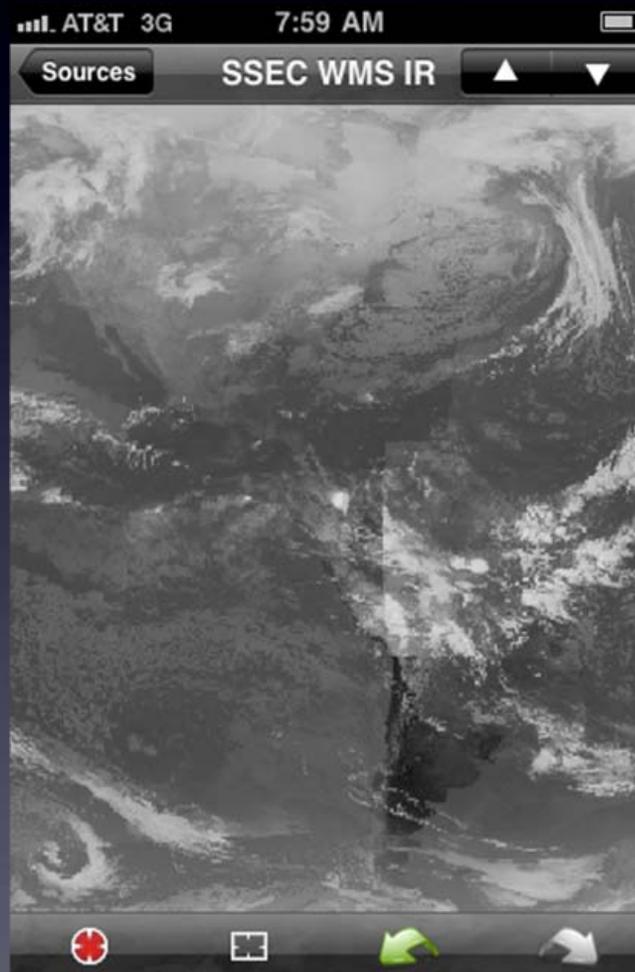
iPad



Any Smartphone: Android, Blackberry, etc.

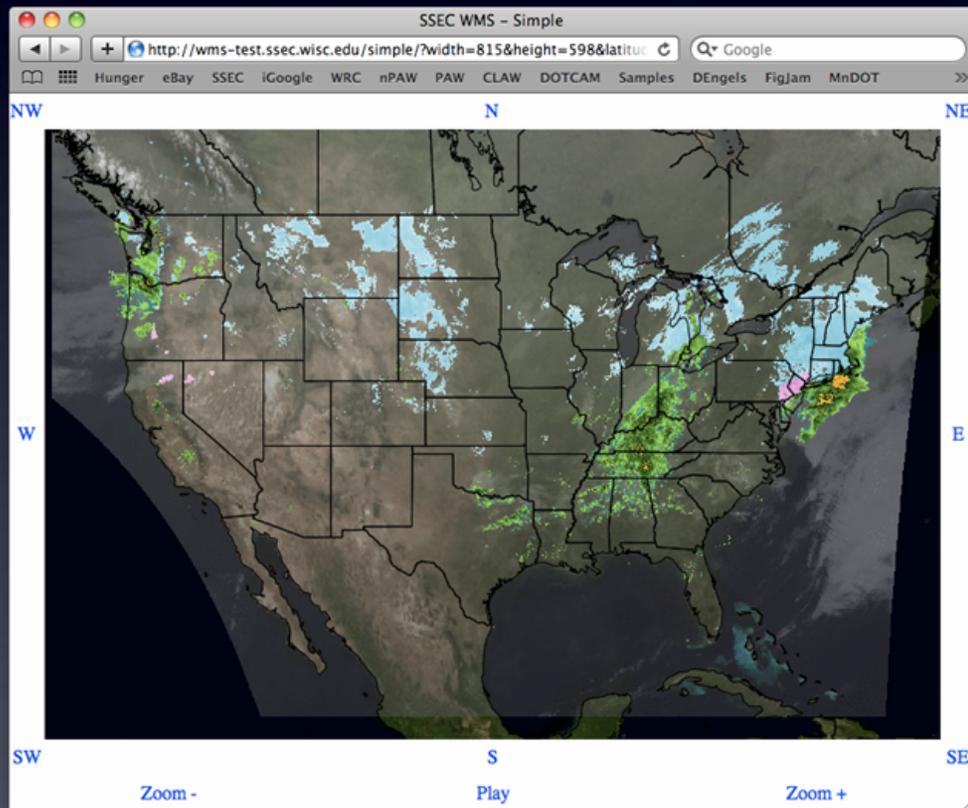
# And more....

- Google Earth
- ArcGIS
- Other clients

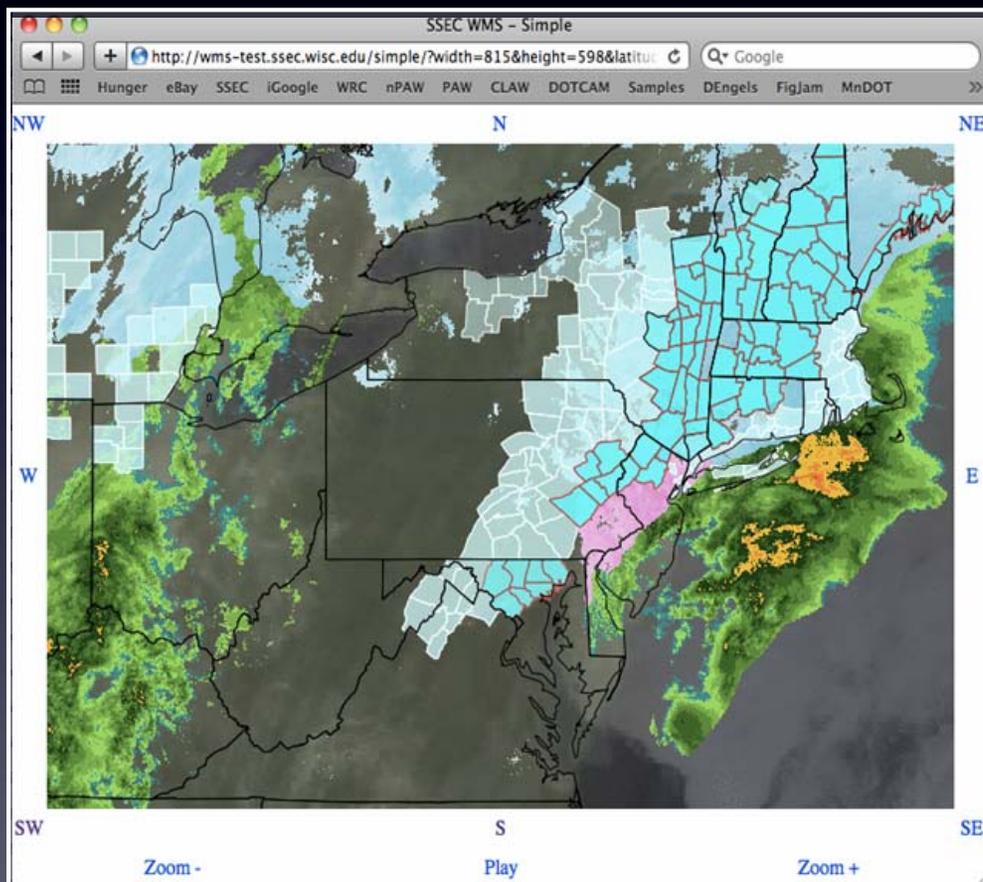


iPhone app: WhateverMap

# Two Interfaces: Simple vs Google Map



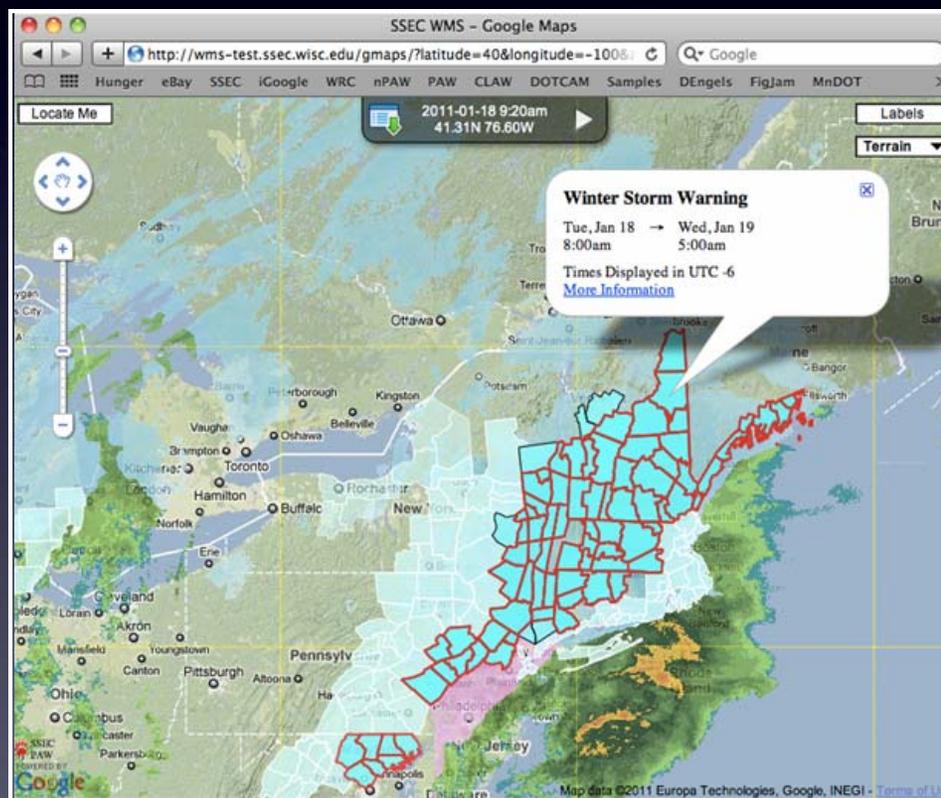
# Simple Interface



- GIF or Animated GIF
- No Javascript
- Image is compressed and converted by server
- Works on wide range of clients
- Faster download
- No dynamic zoom, roam or popups

# Google Map Interface

- Manages tiles served from WMS
- Dynamic zoom and roam
- Cached tiles
- Other APIs (Bing, Virtual Earth) are possible



# Standard Weather Products



- Global composite satellite image
- Radar (including phase)
- METARs
- Pilot reports
- Weather watches and warnings
- Storm reports

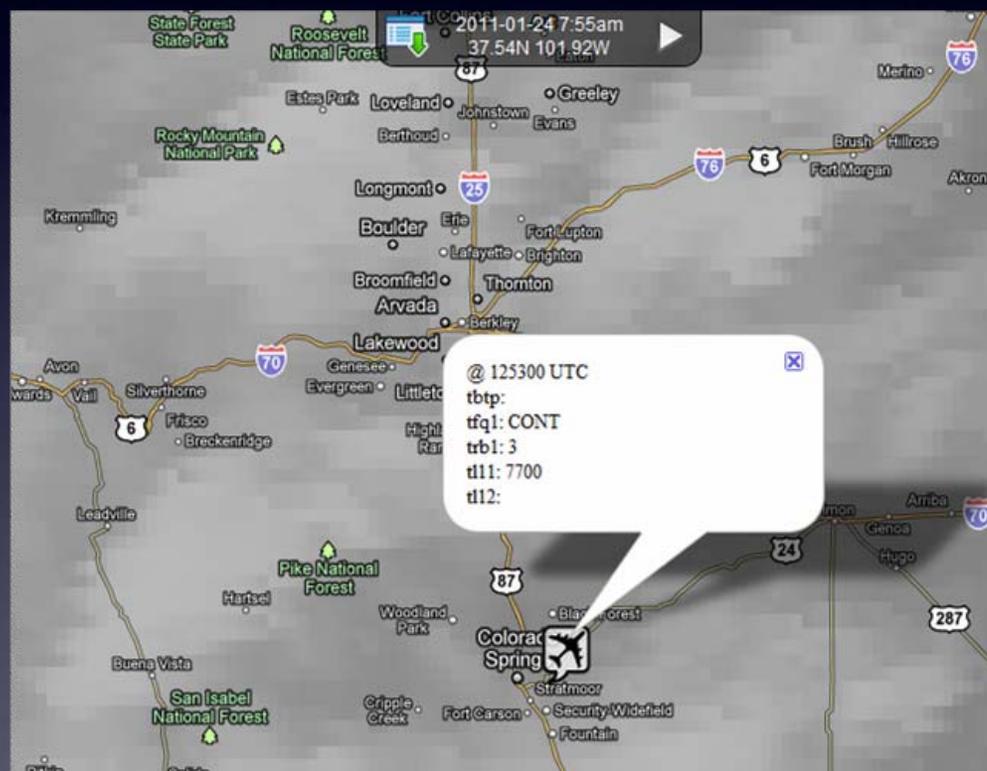
# Satellite and METARs

- Global satellite composite (geostationary and polar)
- METAR reports
- Clickable for additional information



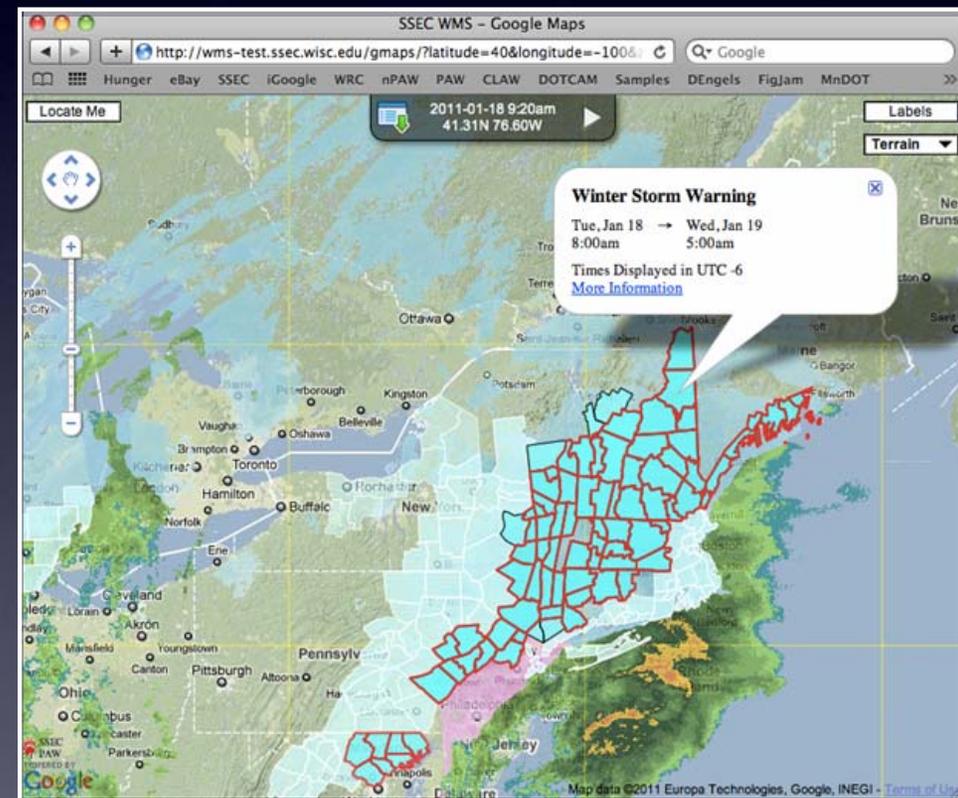
# Pilot Reports

- Decoded PIREPs
- Time-synced with underlying satellite or radar image



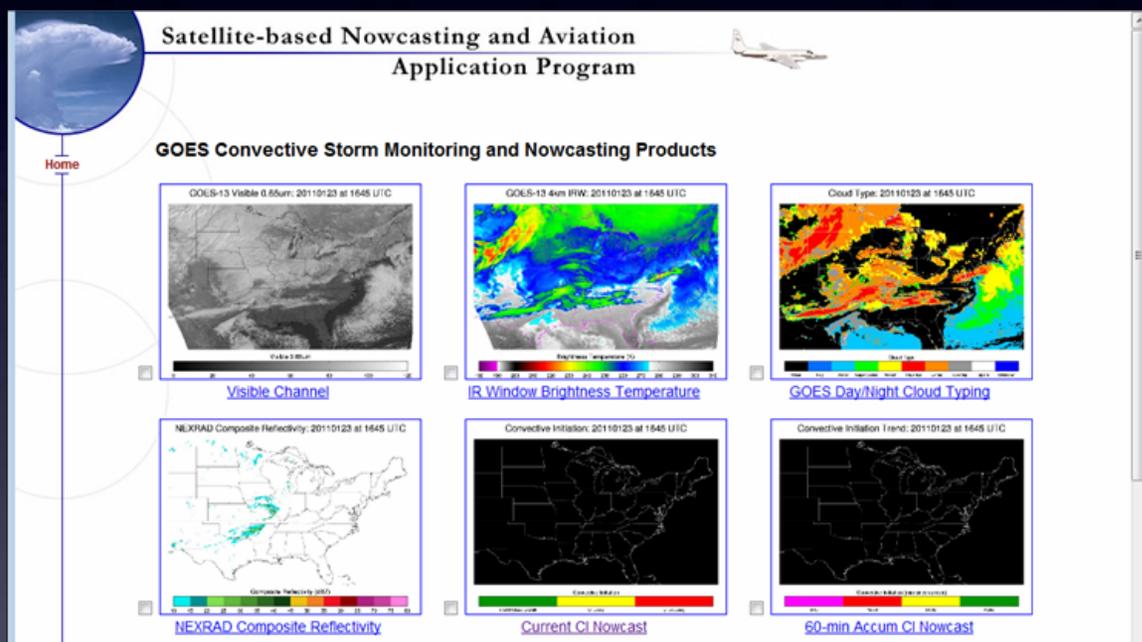
# Weather Warnings

- Decoded NWS county- and polygon-based weather watches and warnings
- Click county to get synopsis; link to complete bulletin
- Severe weather warnings include location of severe weather and forecasted movement



# SNAAP Products

- Convective Initiation
- Turbulence risk
- Overshooting tops
- Lightning risk



<http://cimss.ssec.wisc.edu/snaap/convinit/quicklooks/>

# Convective Initiation

Convective Initiation: 20110123 at 0215 UTC

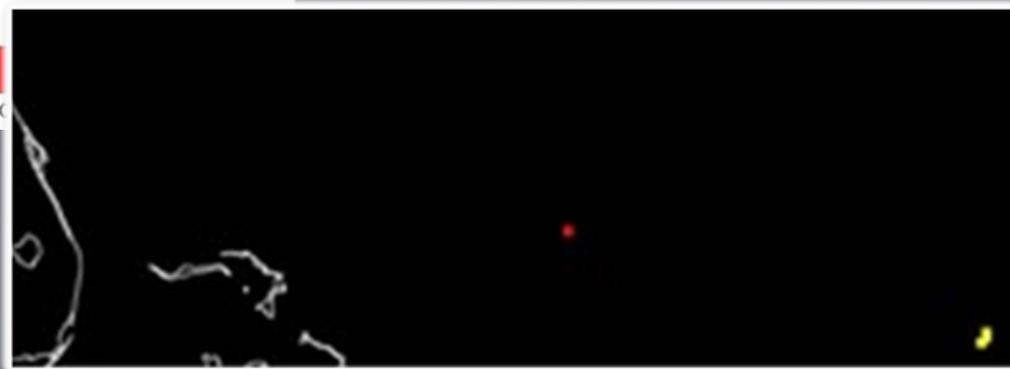


Convective Initiation



Pre-CI Cloud Growth

CI Likely

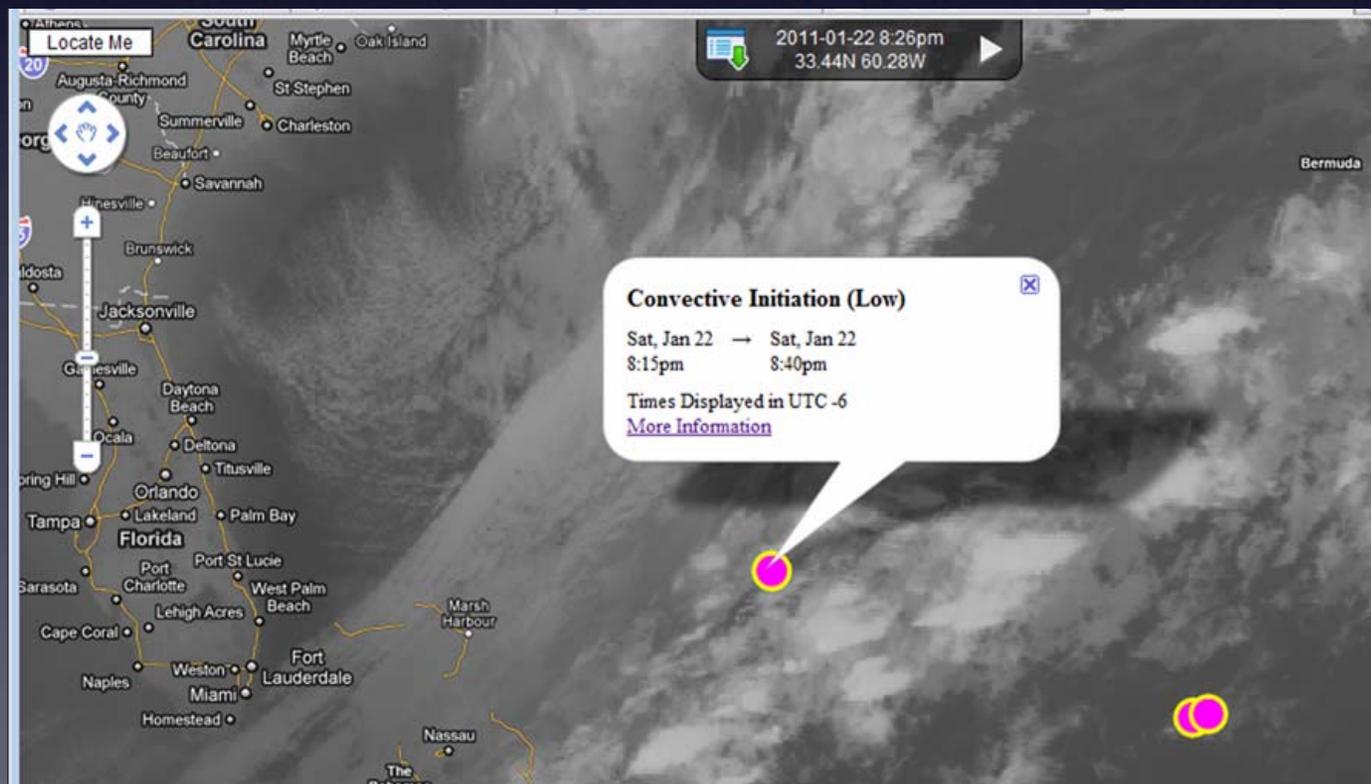


# Convective Initiation



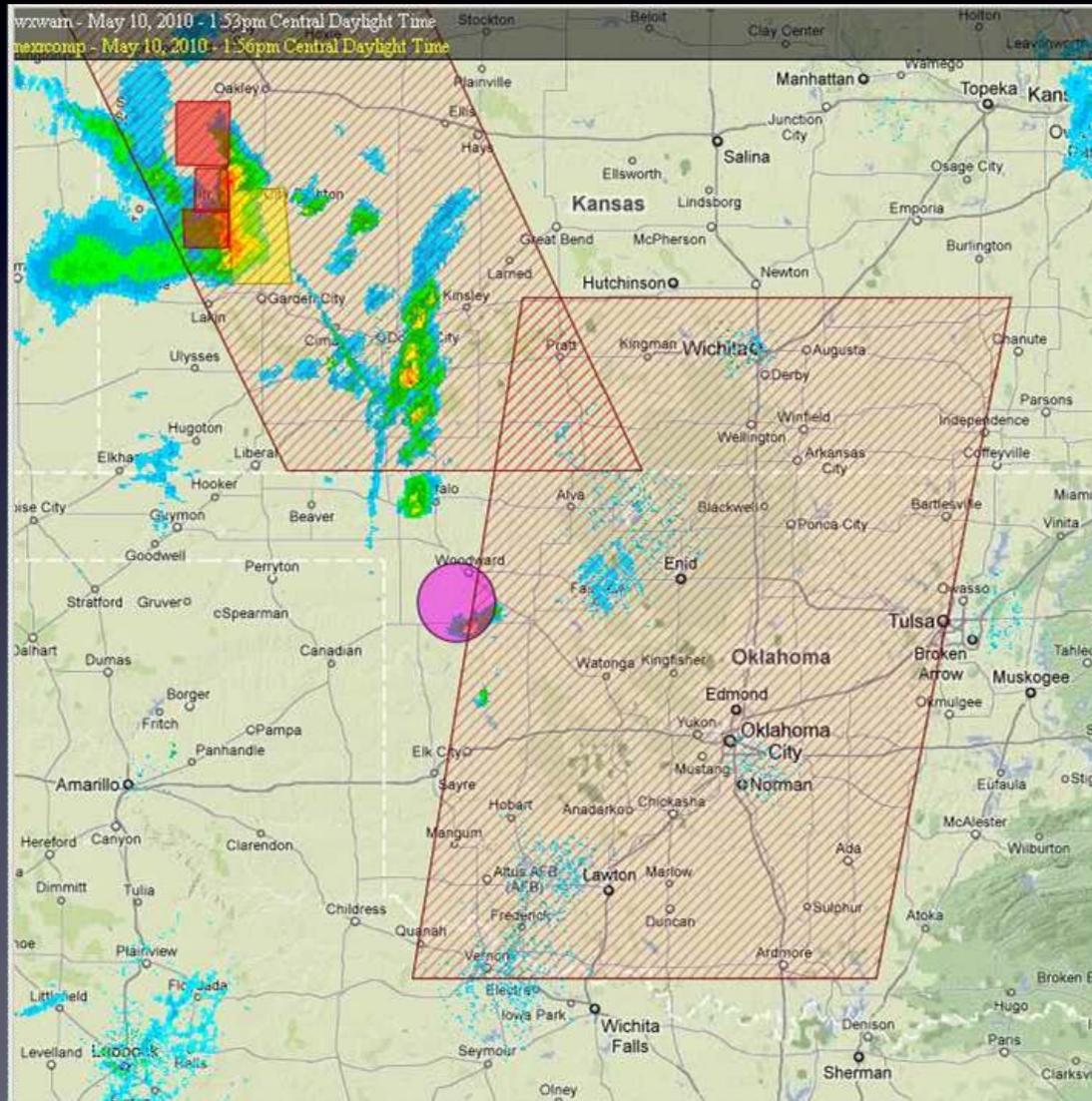
View using WMS

Web page



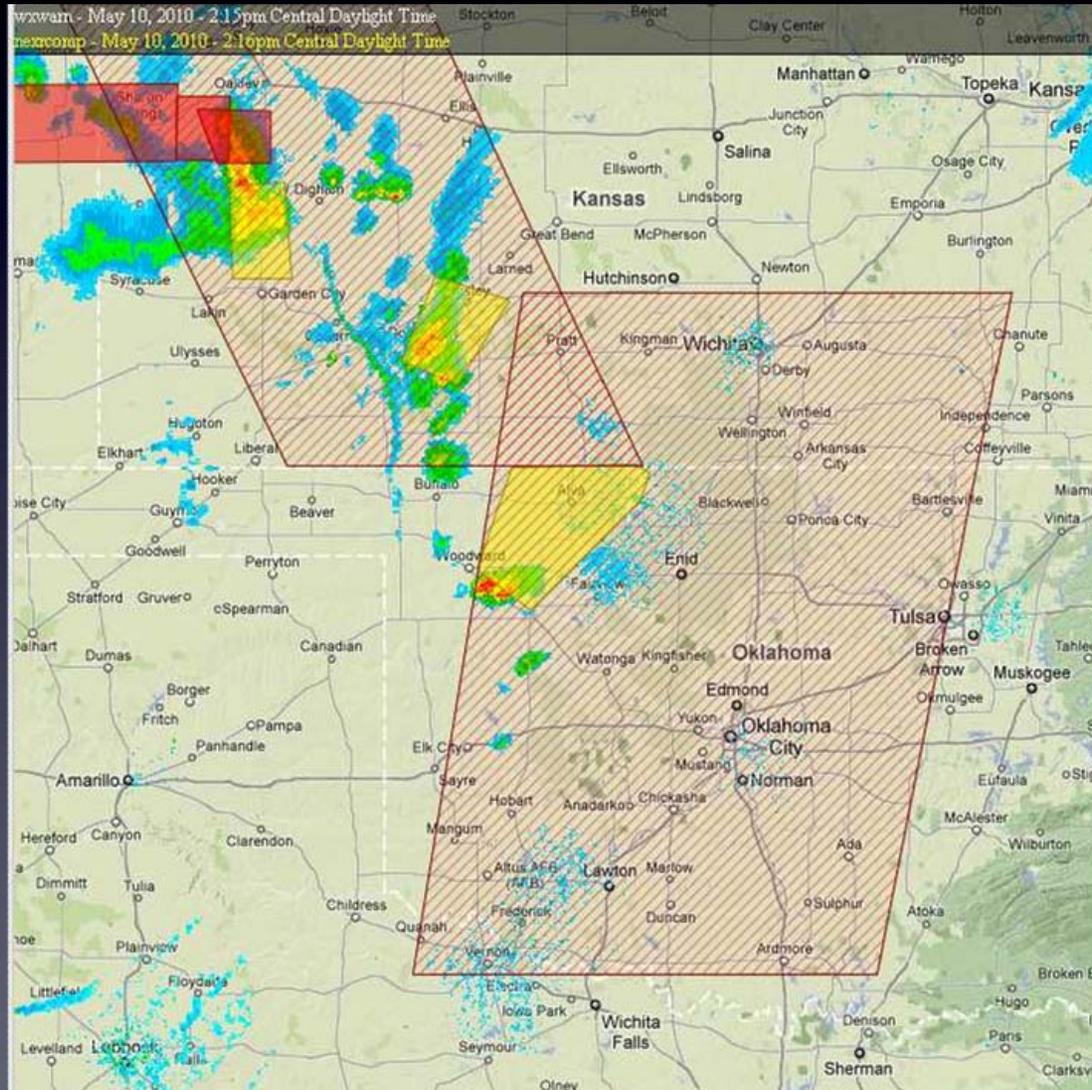
# 10 May 2010

## 1:55 PM



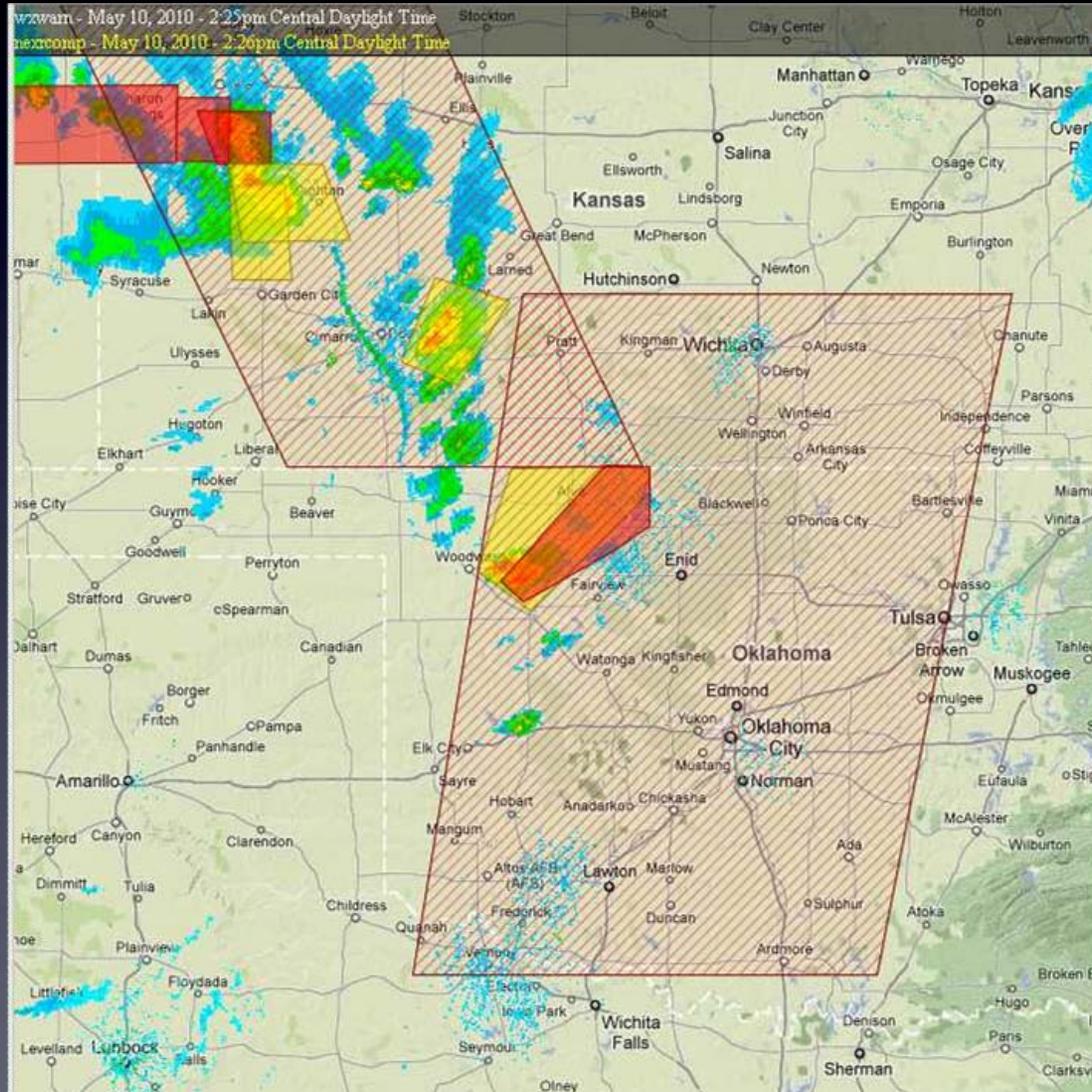
# 10 May 2010

## 2:15 PM



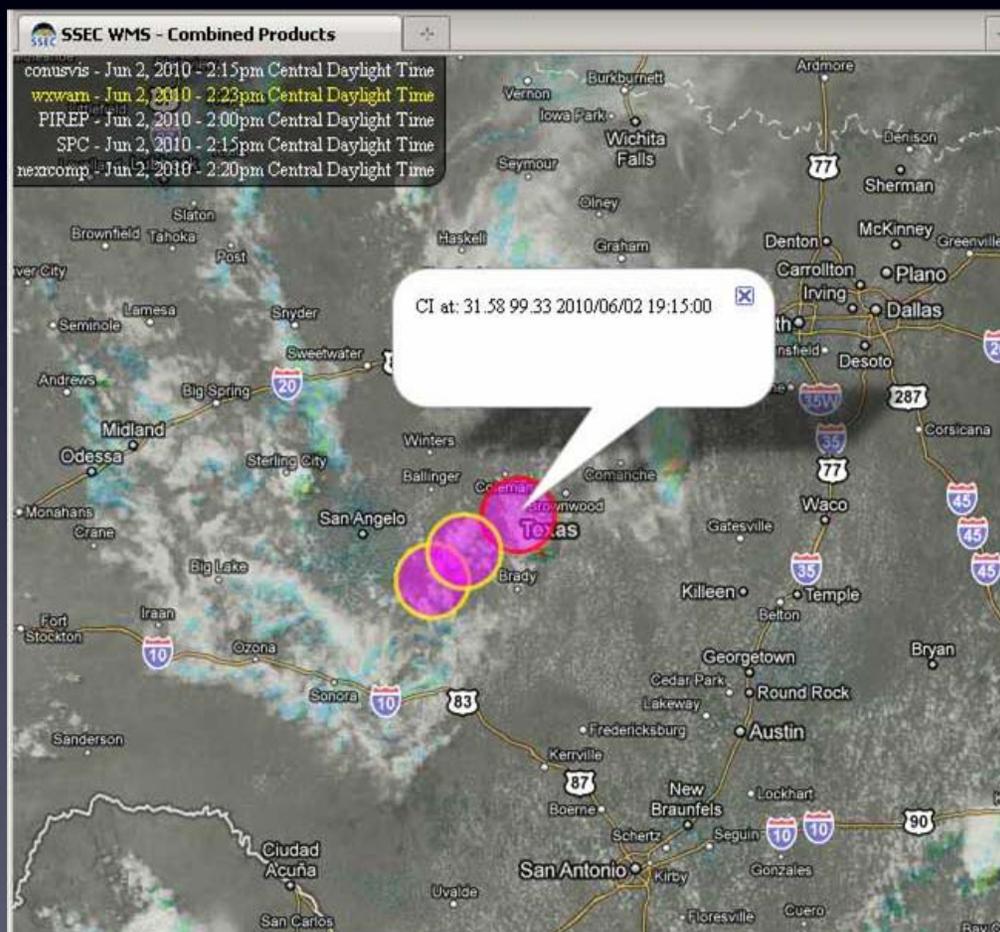
# 10 May 2010

## 2:25 PM



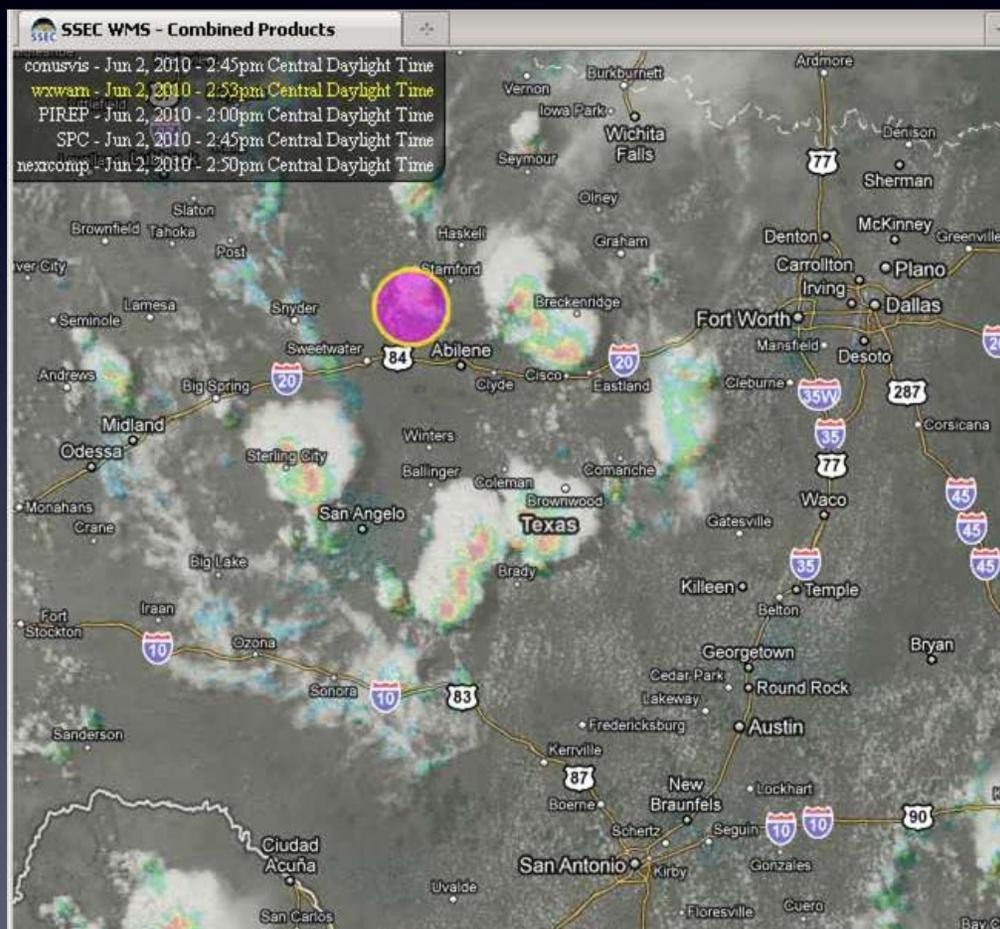
# 2 June 2010

## 2:15 PM



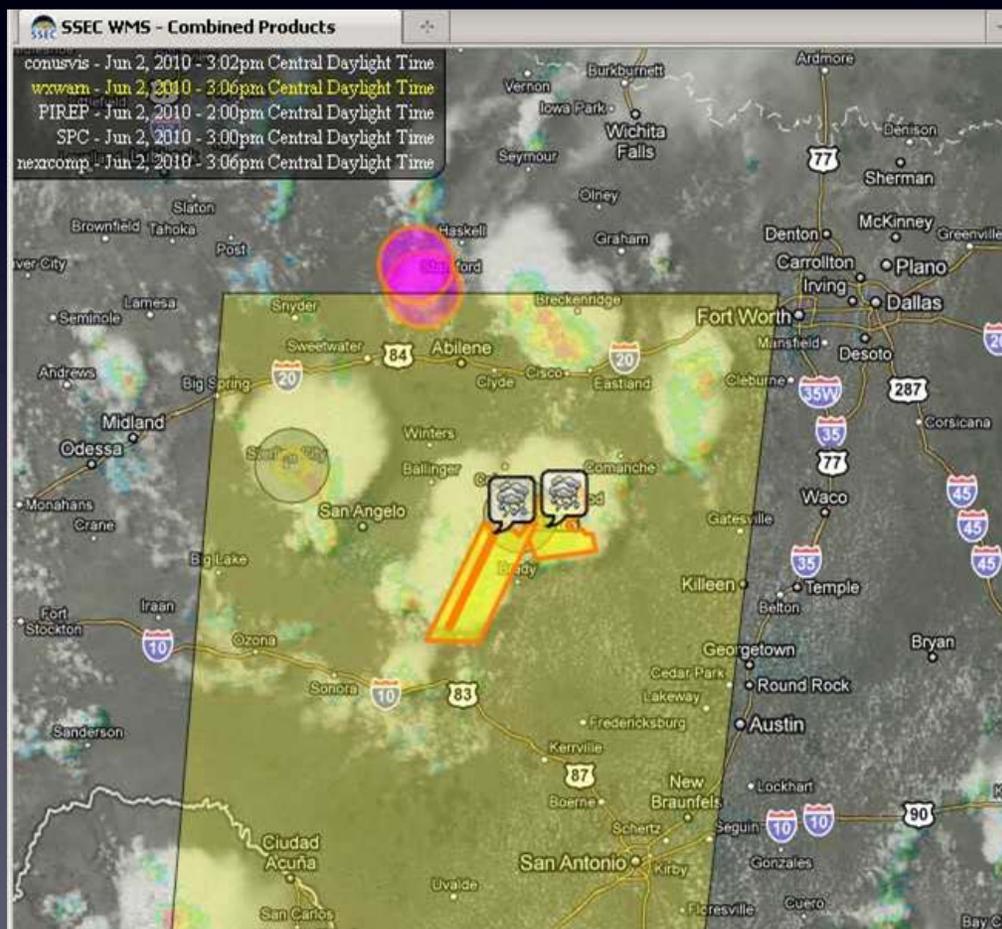
# 2 June 2010

2:45 PM



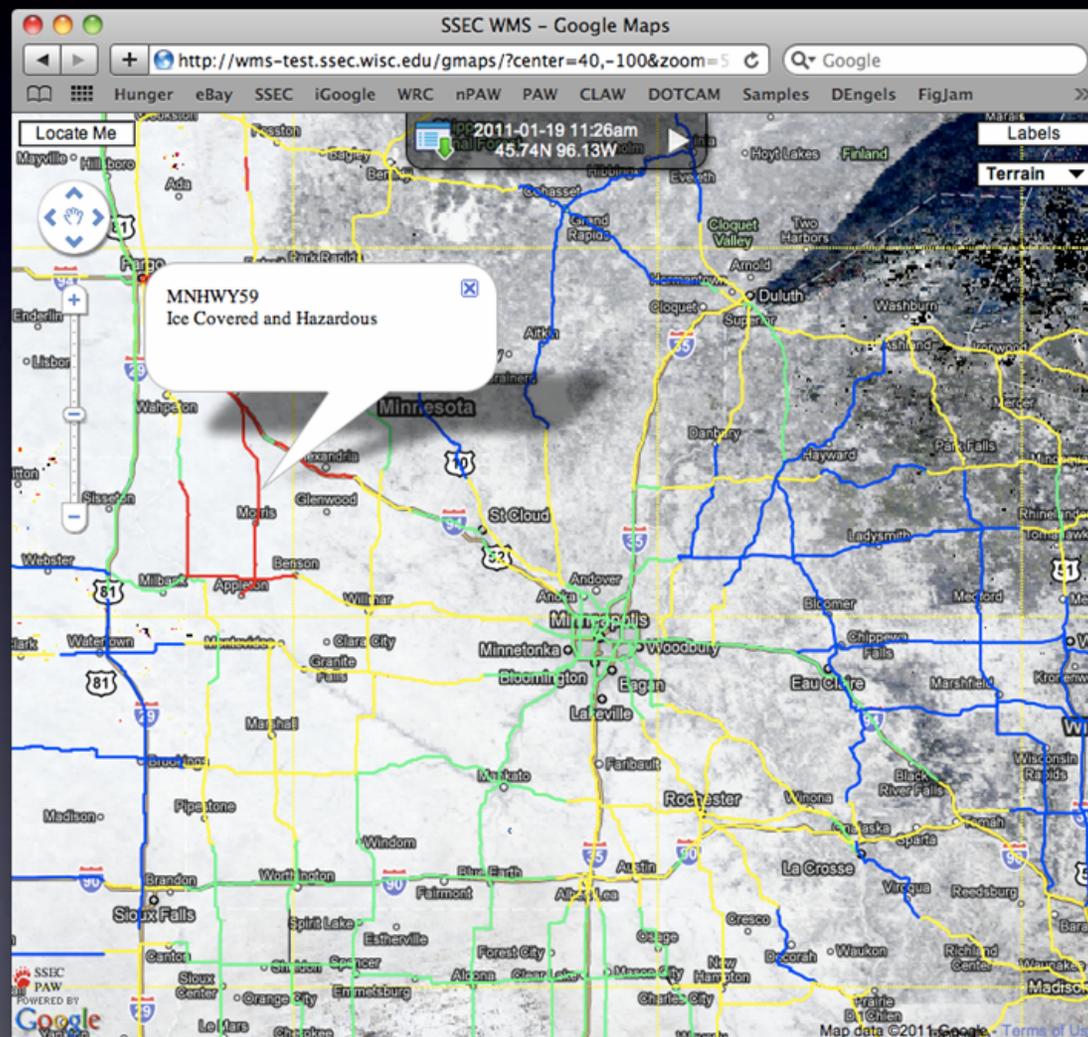
# 2 June 2010

3:05 PM



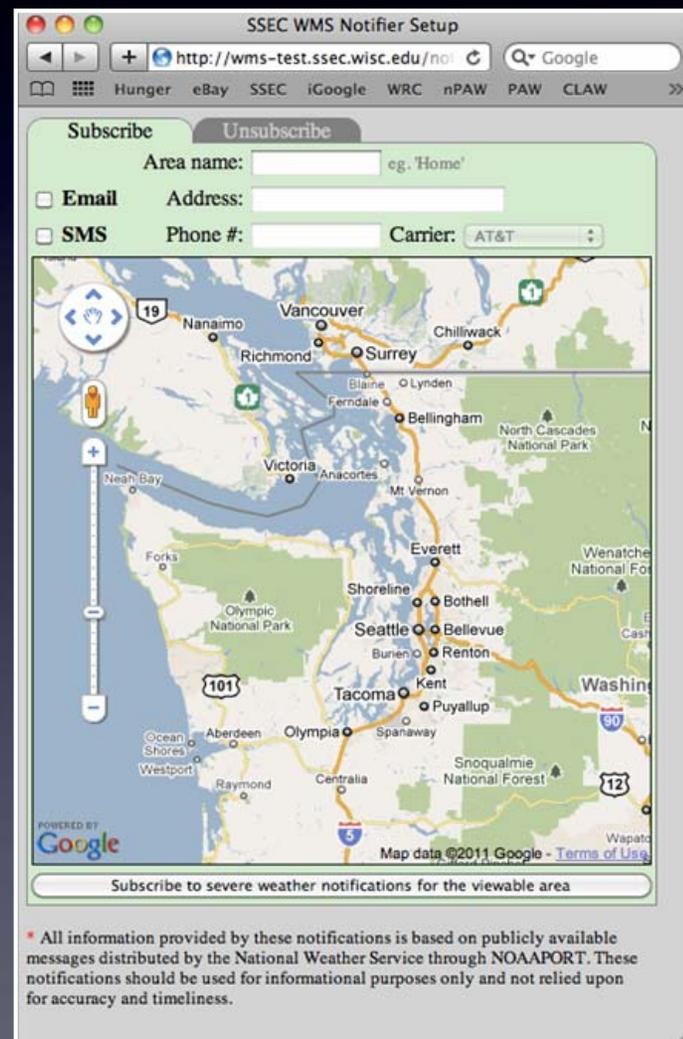
# Other Products

- Clickable winter road conditions
- Observations: Latitude, longitude, time, value(s)
- Text listing, regions (polygons), images (GeoTIFF)



# Event Notification

- Email, SMS and iPhone/Android notifications
- Configurable for regions and different weather events



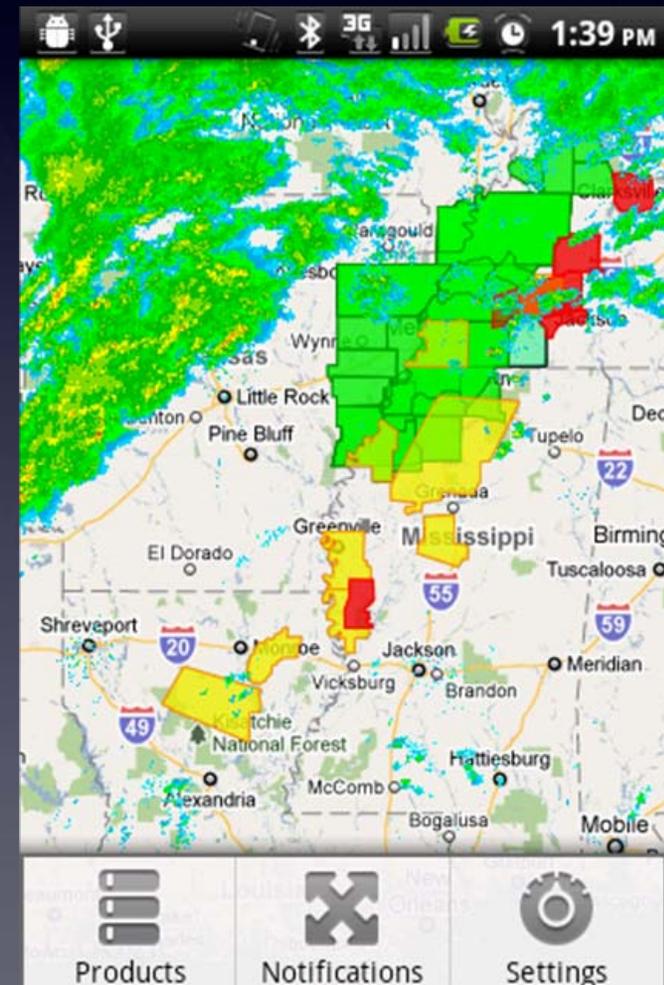
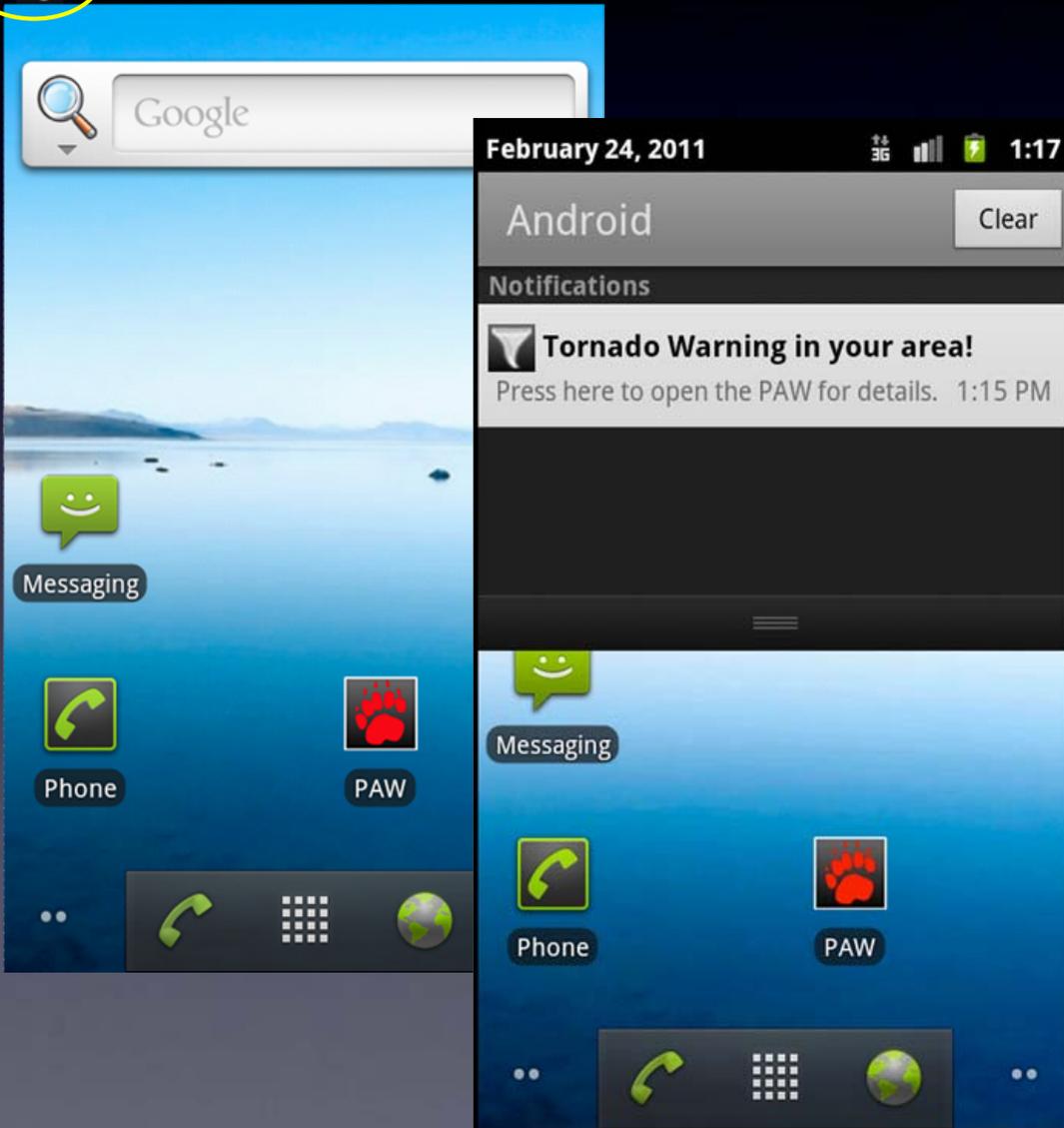
# Native App: iOS

- iPhone and iPad
- GPS user tracking
- App receives push notification which triggers WMS display
- Notifications can be configured within the app



# Native App: Android

 There is a tornado warning in your area!





# Summary

- A WMS provides flexibility in staging a variety of data products
- A WMS can serve images to many different clients (desktop browsers, mobile devices, Google Maps, etc.)
- Native apps will provide real-time notification of events and product display