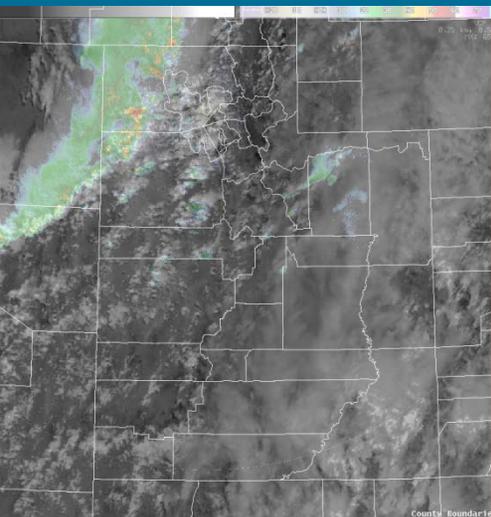


Proving Ground Activities and Opportunities: WFO Salt Lake City Perspective



Randy Graham

Science Operations Officer

Salt Lake City UT

May 18th, 2011



Overview

- *How we got here?*
- *Experience with current products*
- *Challenges and opportunities*



How we got here....

- ***Interaction with Jordan Gerth and CIMSS***
 - *CIMSS/ASPB visit WRH and WFO SLC in February for 2-day workshop*
 - *Presentations shared over GoToMeeting*
- ***Interaction with Ed Szoke at AMS Annual Meeting in January 2011***
 - *Subsequently worked with Ken Pomeroy to ingest CIRA imagery through WR LDM*



Current Products and Activities

- **CIRA**

- *Low Cloud/Fog Discrimination*
- *Dust Product*

- **CIMSS**

- *MODIS*

- **Training**

- *AWIPS procedures for staff*
- *Modules as available*

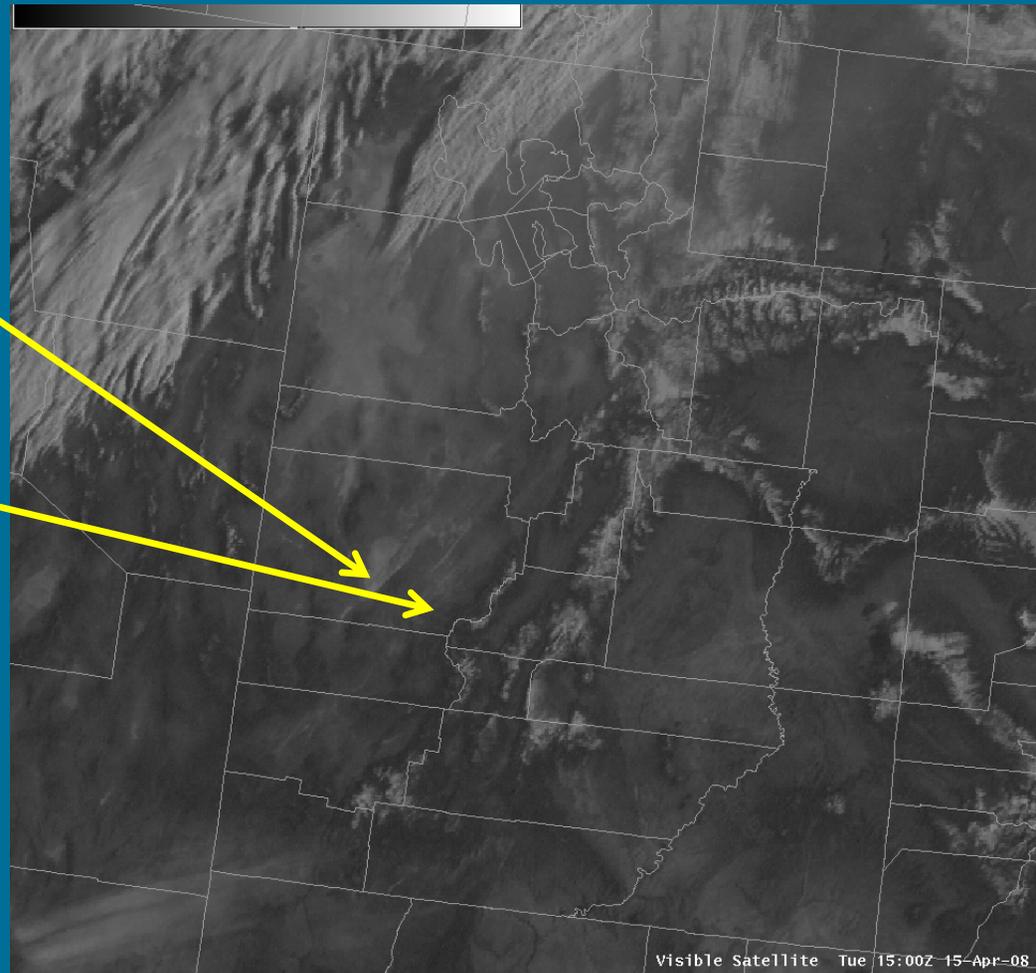
- ***Working with SSD and WR Satellite Advisory Committee to potentially add additional CIMSS products to LDM feed***

- ***Shared several mountain wave, fog, and rime ice events with CIMSS for product validation***



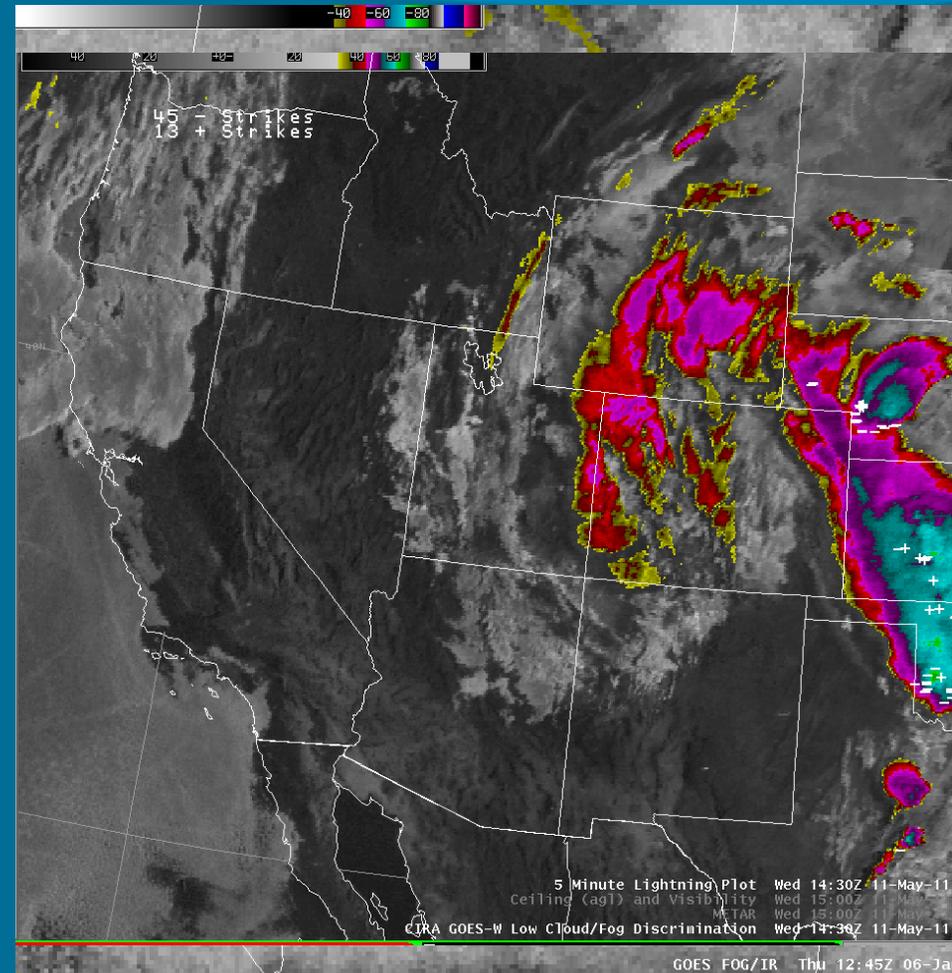
15 April 2008 – Dust Plume

- *Dust plumes off of Sevier lake bed*
- *Burn scars*
 - *Milford Flat fire largest on record in Utah*
- *Impacts*
 - *Visibility reductions along I-15 and Wasatch Front airports*
 - *Air quality issues along Wasatch Front*



Low Clouds and Fog

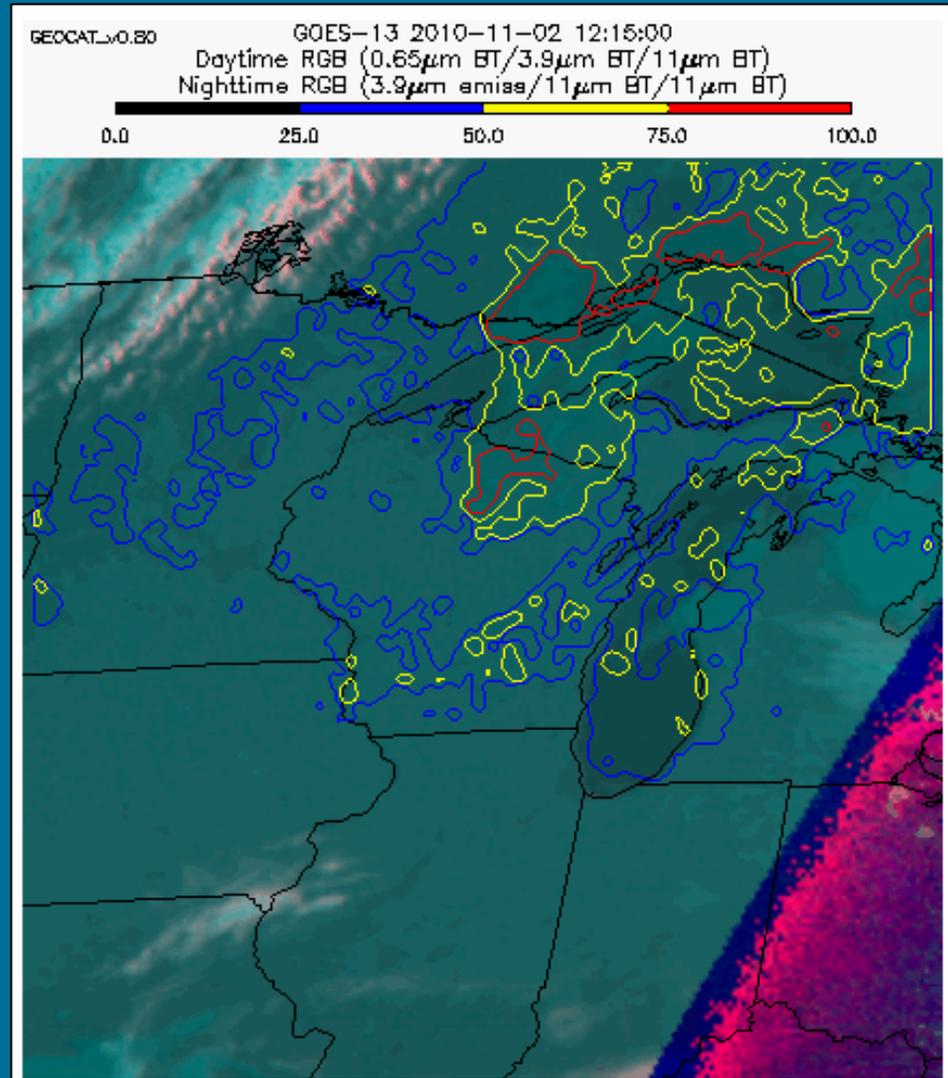
- *Low clouds and fog have significant impact on Wasatch Front airports*
- *Lake can act as a reservoir for fog*
 - *Example shown here: VSBY went from P6SM to $< \frac{1}{4}$ mile in 9 minutes*
- *Difficult to see fog in populated Wasatch Mountain valleys*
- *Forecasters immediately gravitated to new imagery*
 - *Better than baseline sources*
 - *Auto-update held use back...recently resolved*



CIRQUE'S FOG/IR Fog Product

Fog Confidence Products

- *Fog Confidence Product*
- Has not been tested in the west
- *Very interested in testing this product next cool season*
- *Could be very useful for mountain valley fog events*



Challenges and Opportunities

- *Rime Ice Events*
- *Rainfall Rate*
- *Wildfire hotspots*



Rime Ice Events

- *Rime ice events are driven by clouds that do not support heterogeneous nucleation (cloud top temperatures $> -12^{\circ}\text{C}$)*
- *Significant riming can lead to unsafe operating conditions*
 - *Safety officials required to keep equipment running all night to limit ice build-up*
- *Can also have impact on avalanche potential*



Photos Courtesy: Snowbird
Avalanche Control

IR Satellite Loop – 12 November 2008 0700-1700 UTC

0700 UTC -16°C

0800 UTC -14°C

0900 UTC -12°C

1000 UTC -11°C

1100 UTC -9°C

1200 UTC -9°C

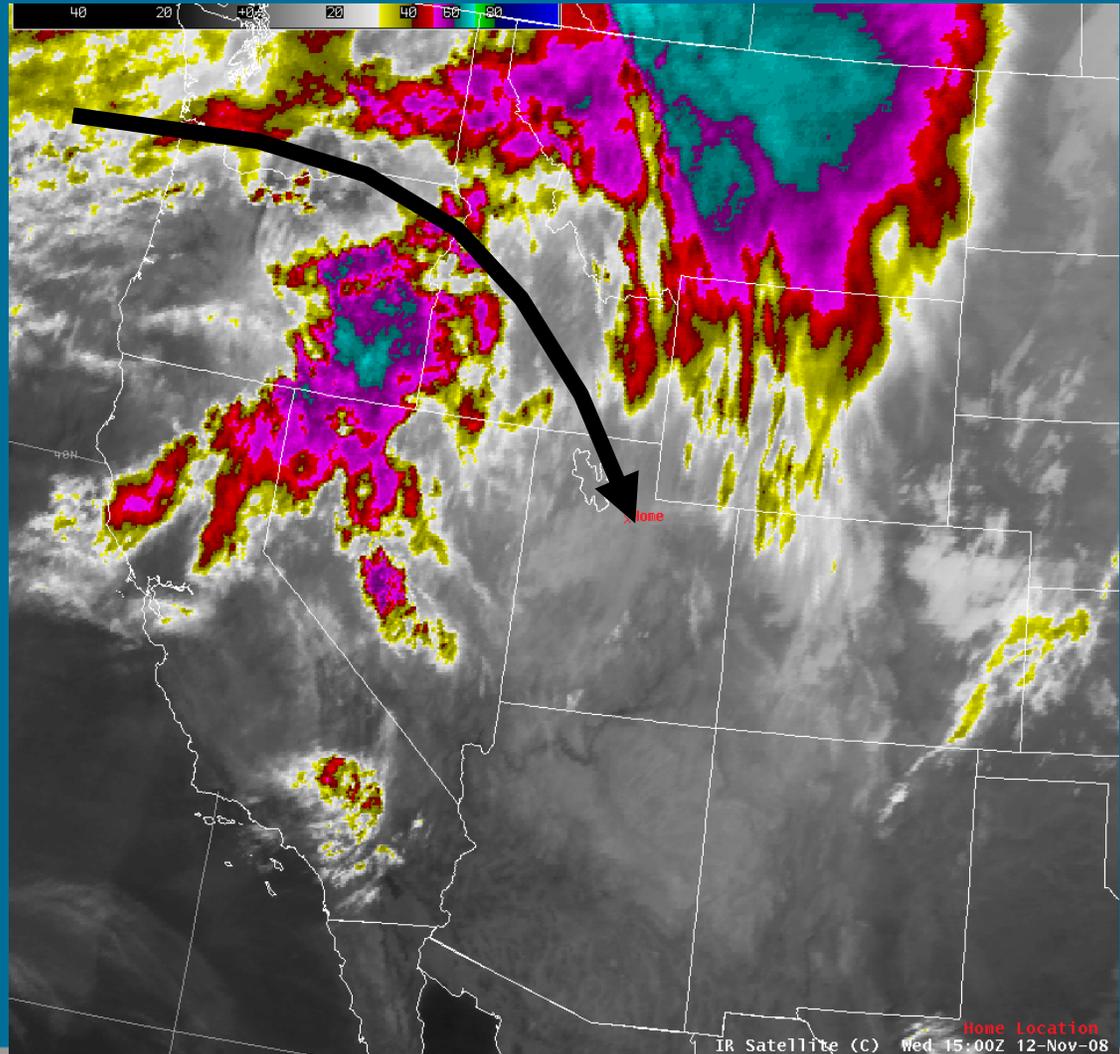
1300 UTC -9°C

1400 UTC -10°C

1500 UTC -11°C

1600 UTC -10°C

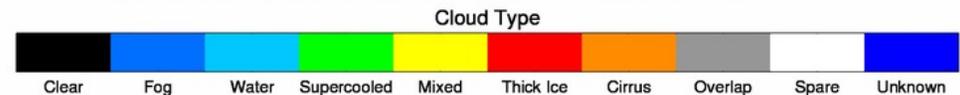
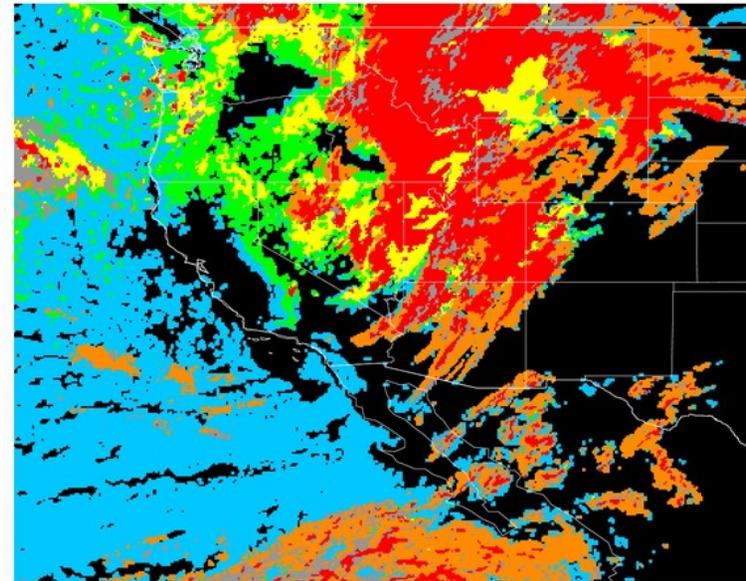
1700 UTC -11°C



Cloud Phase Product

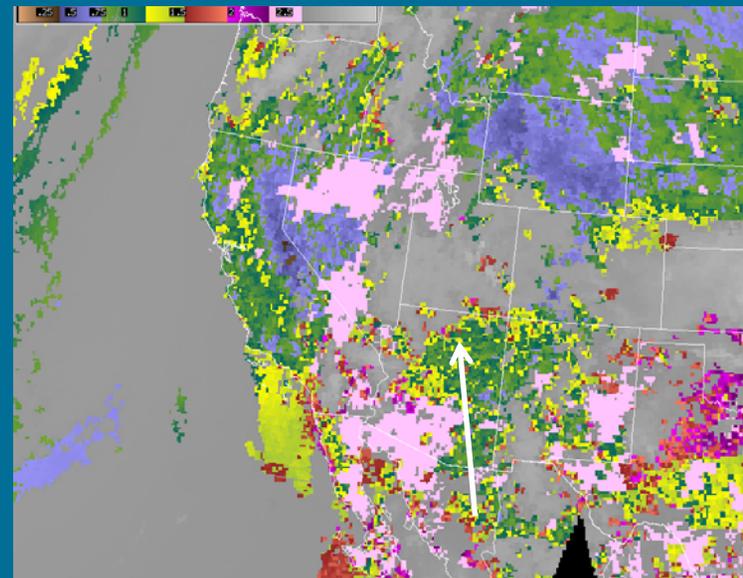
- **Cloud Phase product identifies dominant phase**
 - Based on cloud temperature and cloud depth information
- **Could be useful for remote determination of p-type and identification of rime ice events**
- **Hope to test product next winter**

Cloud Type: 20101108 at 1900 UTC

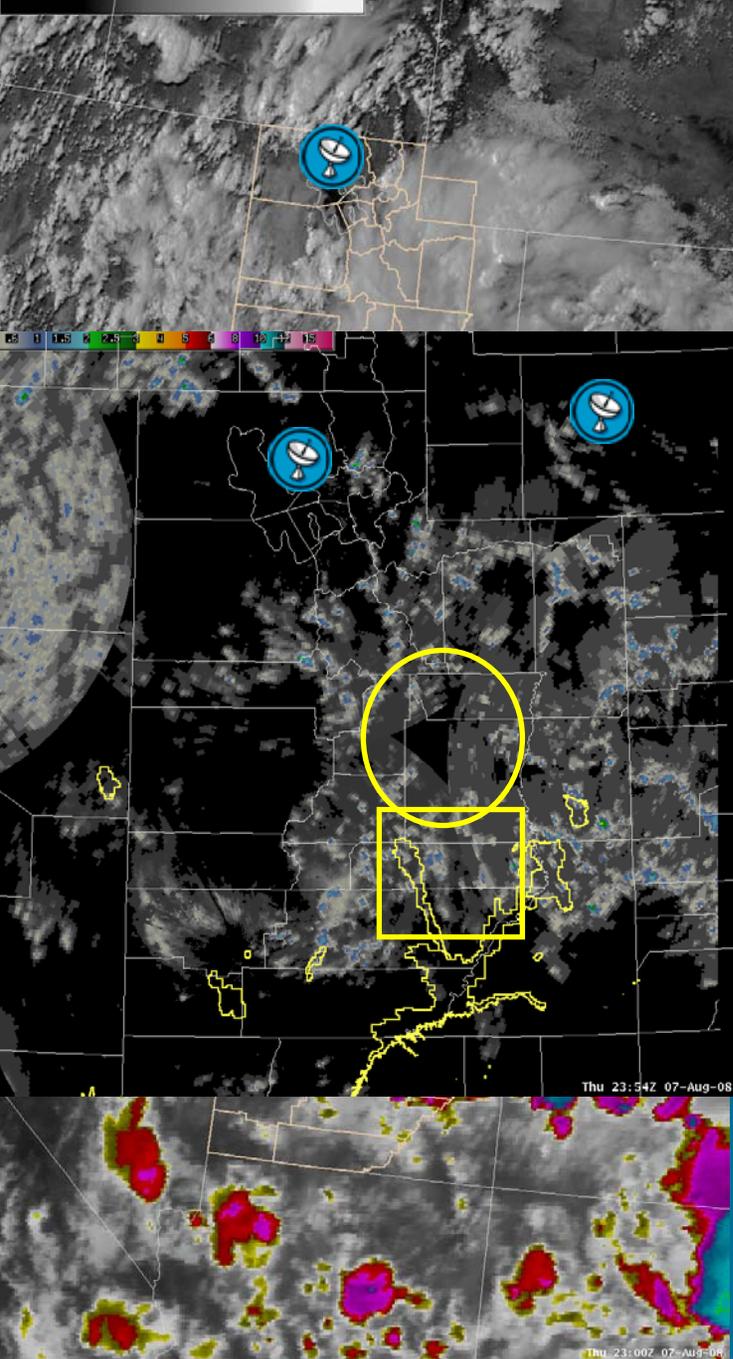


Monsoon Surges

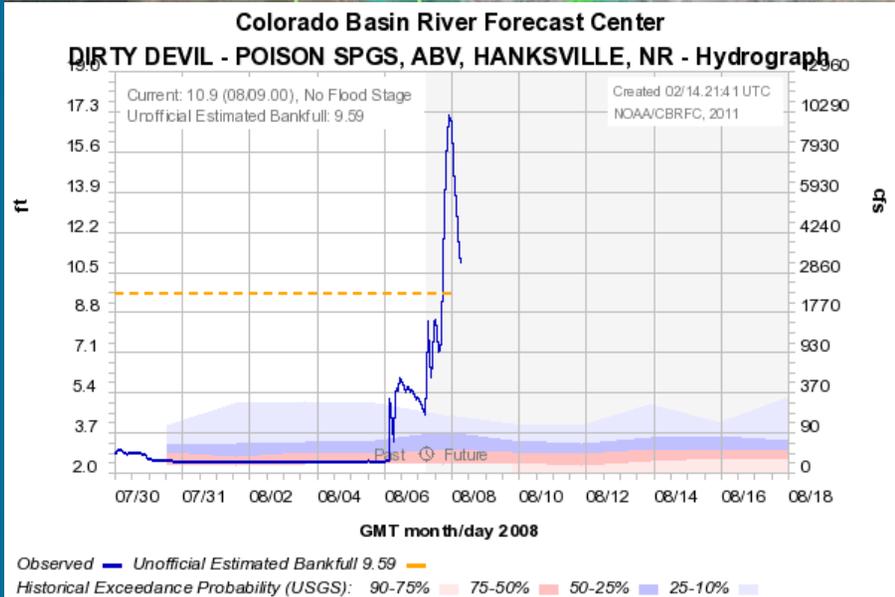
- *Summer monsoon surges have significant impact on southern Utah*
- *Issue ~40 Flash Flood Warnings per year*
- *Very exposed population with numerous National Parks and National Monuments in the state*
- *Satellite PW products are VERY useful for tracking northward progression*



Low topped convection over eastern Utah



- *Significant monsoon moisture surges into eastern Utah*
- *Much of this area has no radar coverage below 15-20 kft AGL*
- *Difficult storm interrogation and poor or non-existent precip estimates*
- *Area where satellite QPE and rainfall rates could be valuable*



Tracking Wildfires

- *Average ~1300 fires per year*
- *Burned over 100,000 acres 6x since 2002*
- *Issue about 260 Red Flag Warnings per year*
- *Most spots in the NWS over past 5 years*



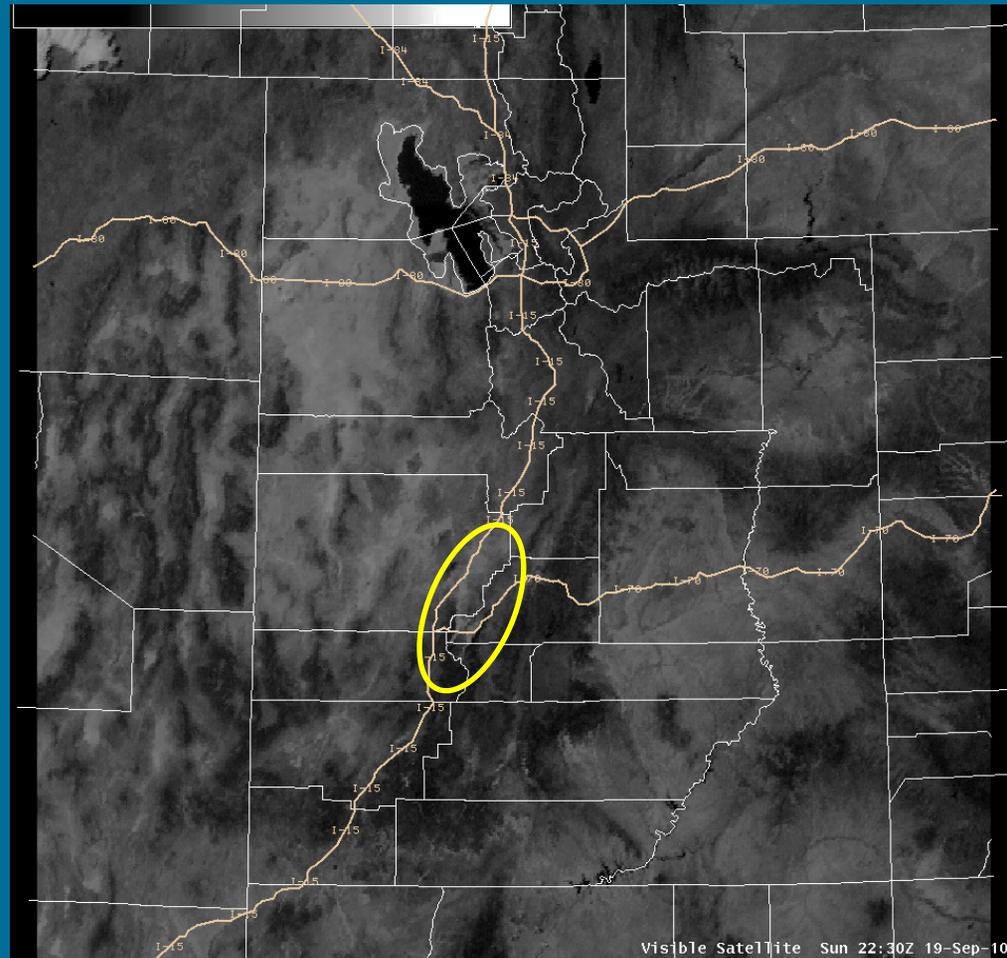
Wildfire Smoke Plumes

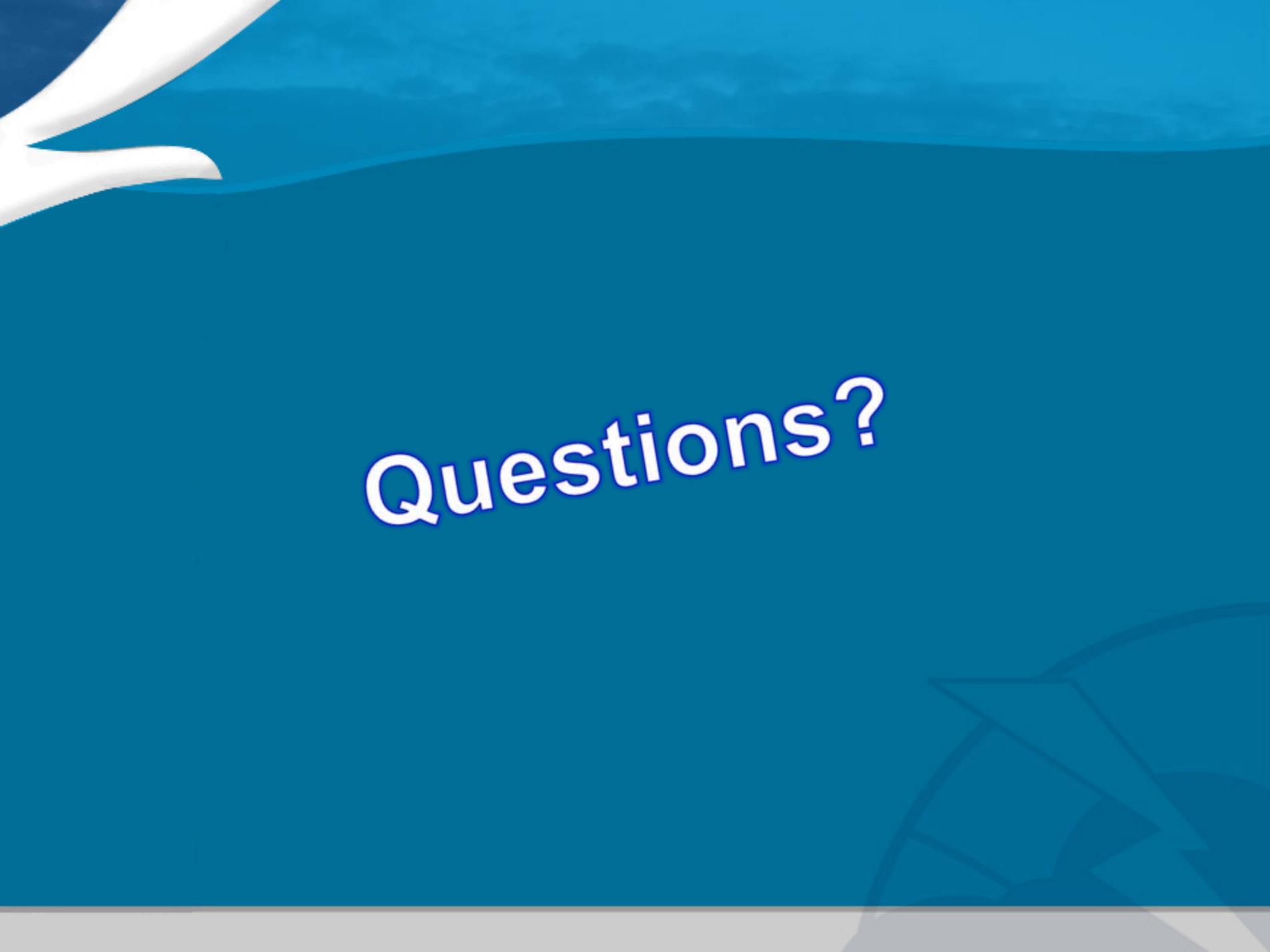
- ***Initiation and intensification***

- *Proactive instead of reactive*

- ***Impacts***

- *Visibility reductions*
- *Air quality issues*
- *Dense smoke advisories and travel impacts*



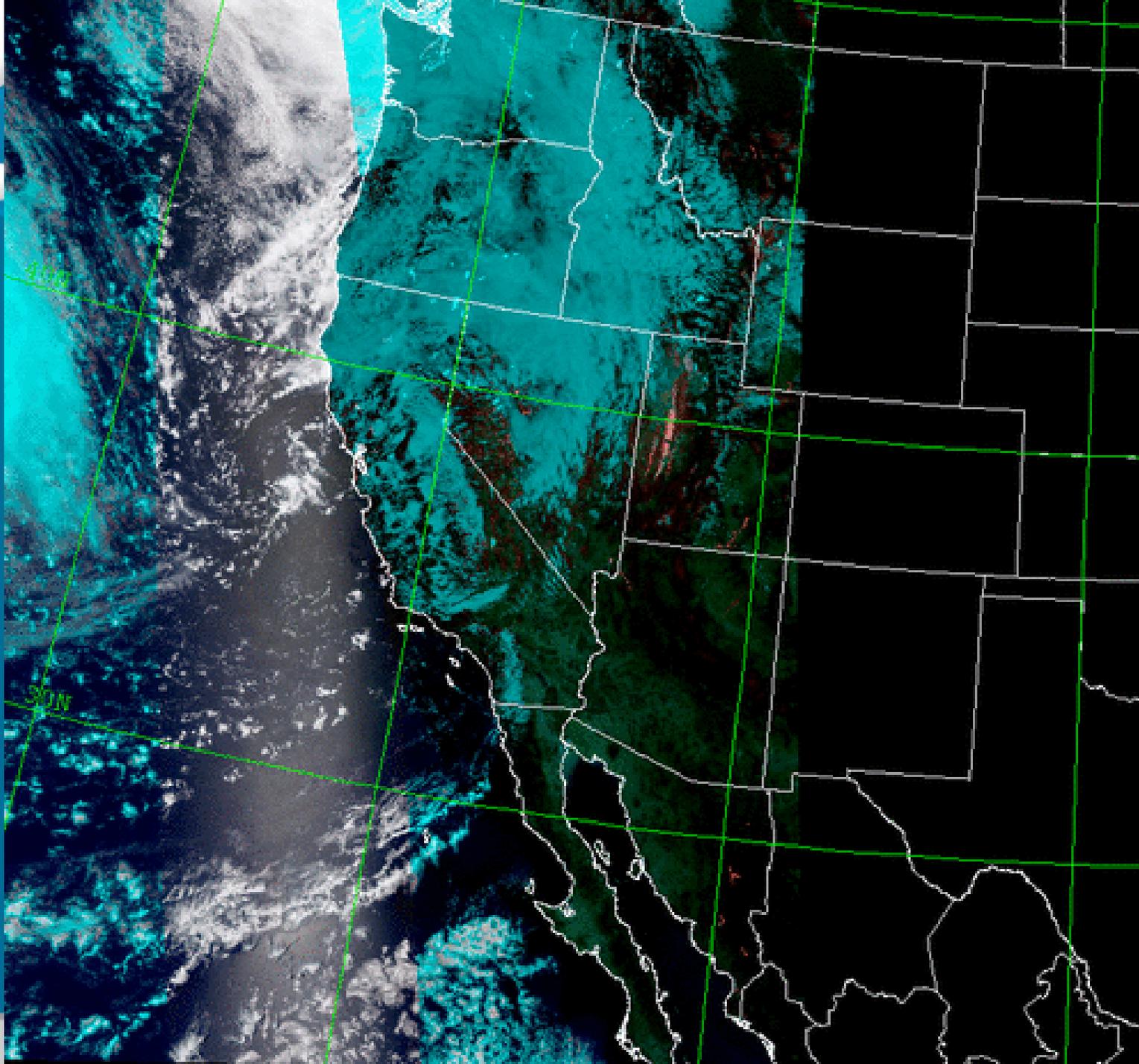


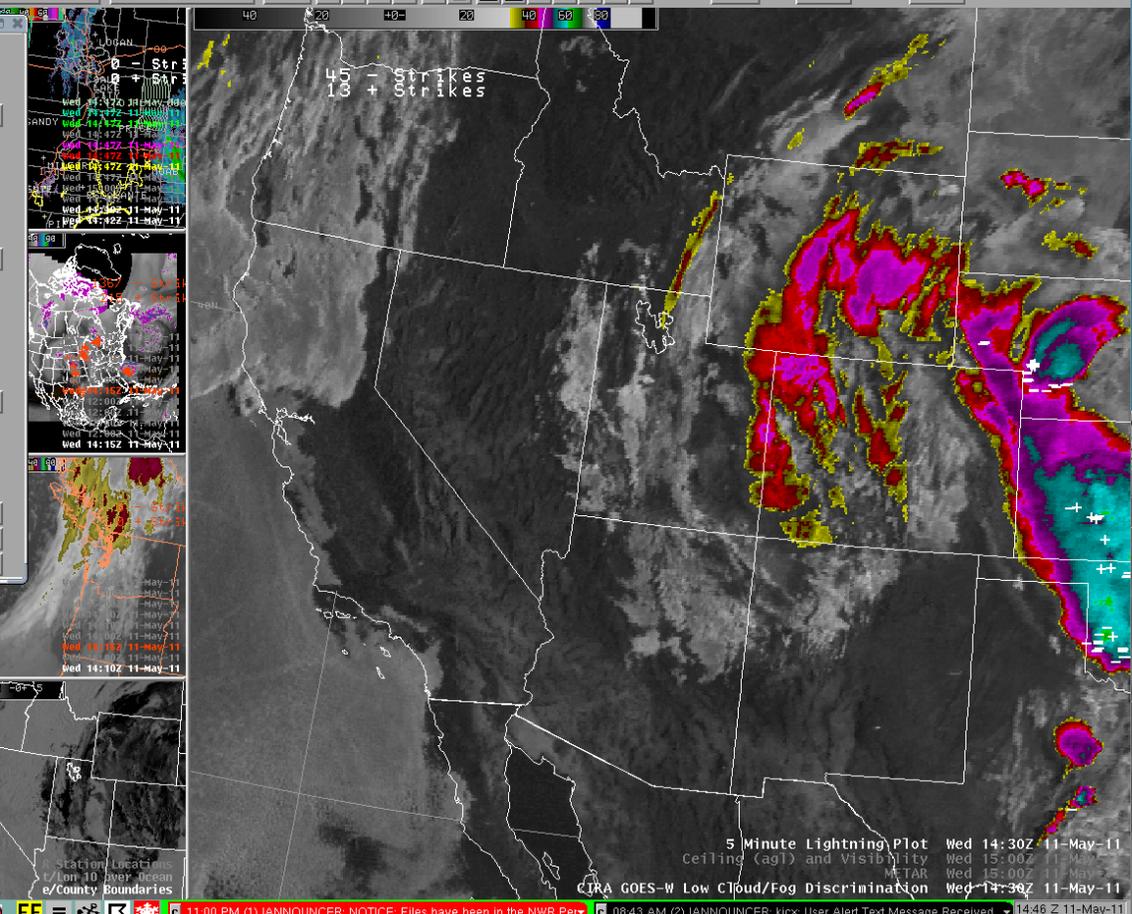
Questions?

Summary

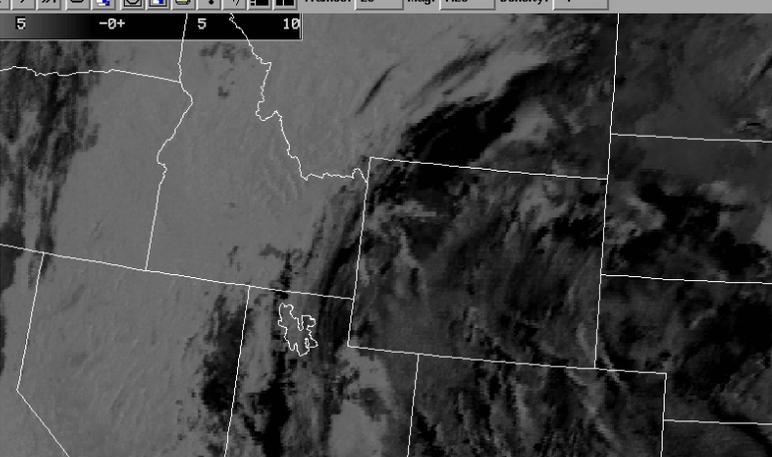
- ***Challenges and opportunities abound in the Great Basin***
 - Dust plumes
 - Wildfires
 - Rime ice events
 - Low clouds/fog
 - Monsoon surges
 - Atmospheric rivers
 - QPE
- ***Looking forward to new tools and displays!***







11:00 PM (1) [ANNOUNCER: NOTICE: Files have been in the NWR Per] 08:43 AM (2) [ANNOUNCER: kicx: User Alert Text Message Received] 14:46 Z 11-May-11



00:40 AM (2) [ANNOUNCER: SIC: V NUL Gett RFS 1441 0.13 0.00] 14:48 Z 11-May-11

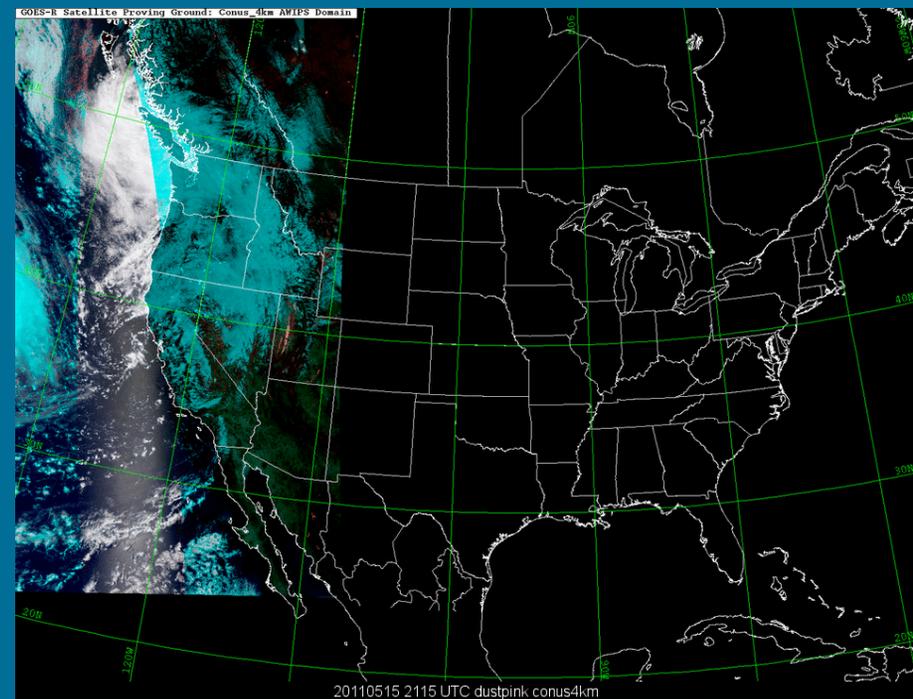
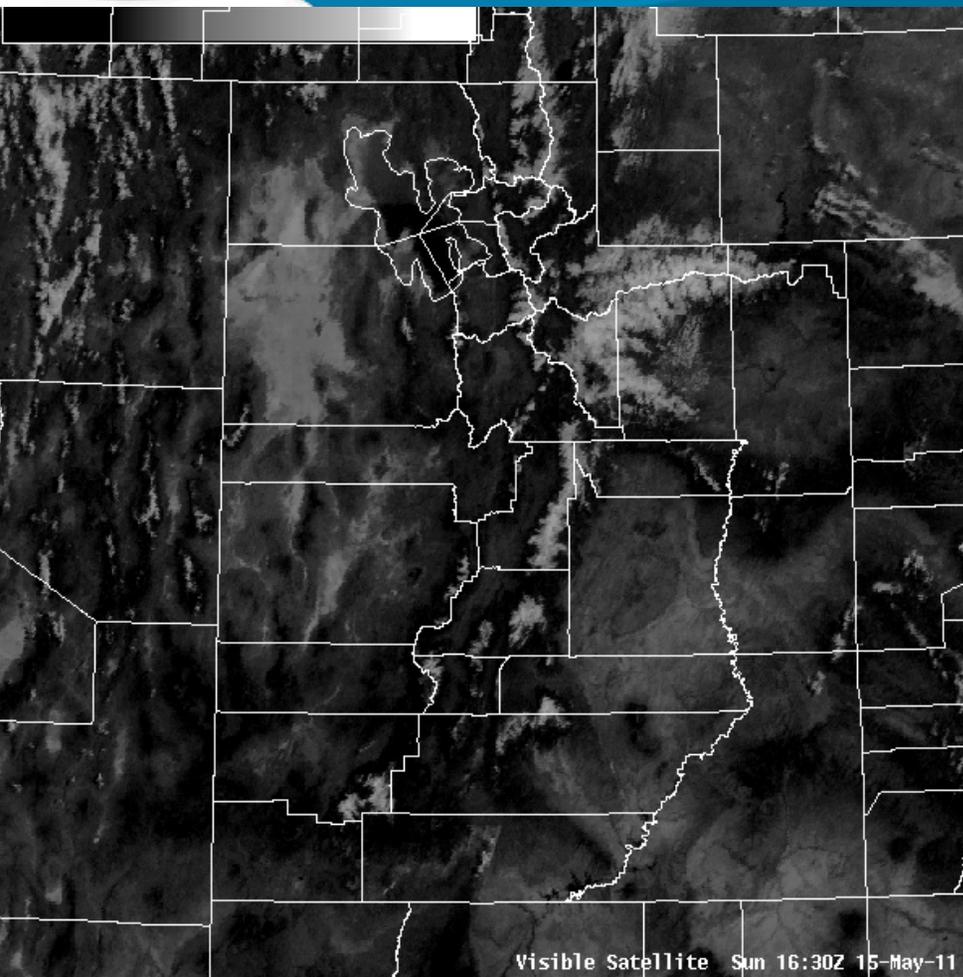
Current

Alter...

Delete

Close

11:00 PM (1) [ANNOUNCER: NOTICE: Files have been in the NWR Per] 00:40 AM (2) [ANNOUNCER: SIC: V NUL Gett RFS 1441 0.13 0.00] 14:48 Z 11-May-11



15 May 7:53 pm 71 23 16 SW 16G25 4.00 BLDU SCT080 997.4 29.58 25.332