GOES-R Proving Ground
CIRA / RAMMB Progress Report

PG All-Hands Meeting
01 July 2013

Outline

- NHC and Pacific Region Proving Grounds
- Selected User Interactions and Examples
  - Snow/cloud layer discriminator color issue fixed (Front Range Collaboration Project with WFOs)
  - Synthetic Imagery and VIIRS for critical fire weather day (BOU WFO on 11 June)
  - ORI update (San Juan WFO and HA)
  - DIA tornado on 18 June and total lightning data
- Systems Report
- Conferences and Meetings

NHC Proving Ground

- 2012 NHC PG final report completed
- 2013 NHC PG ops plan in progress
  - Possible new products
    - VIIRS DNB
    - Daytime microphysics (EUMETSAT RGB)
    - Convective storms (EUMETSAT RGB)
    - CIRA combined Leo/Geo product
- Might be a delay in new product testing due to NHC supercomputer transition and support staff shortage
  - Sep 1st instead of Aug 1st
- M. DeMaria will serve as acting NHC Technology and Science Branch Chief Aug 15th-Sep 25th

CIRA Participation in the Pacific Proving Ground

- ORI product now running in AWIPS-1 at Honolulu WFO
- New TC intensity models for JTWC to be implemented August 2013
  - WP, SH and IO versions of SHIPS, LGEM and RII statistical intensity models
    - HFIP and GOES-R3 funding
  - Lightning version of RII
- Coordinating with B. Ward/S. Businger on ops plan
- Visit to JTWC, HFO and PRH by M. DeMaria and K. Strabala planned for July 9-11, 2013

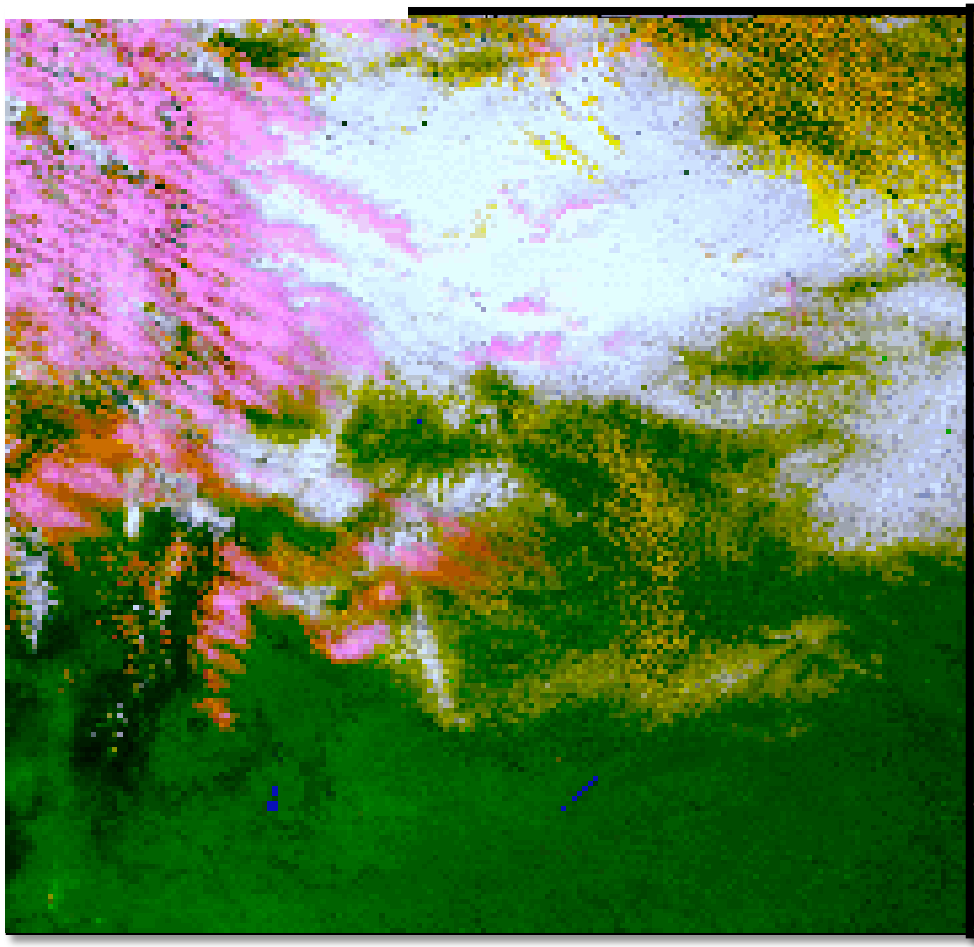
Improvements to AWIPS Color Mapping for Cloud Layers & Snow

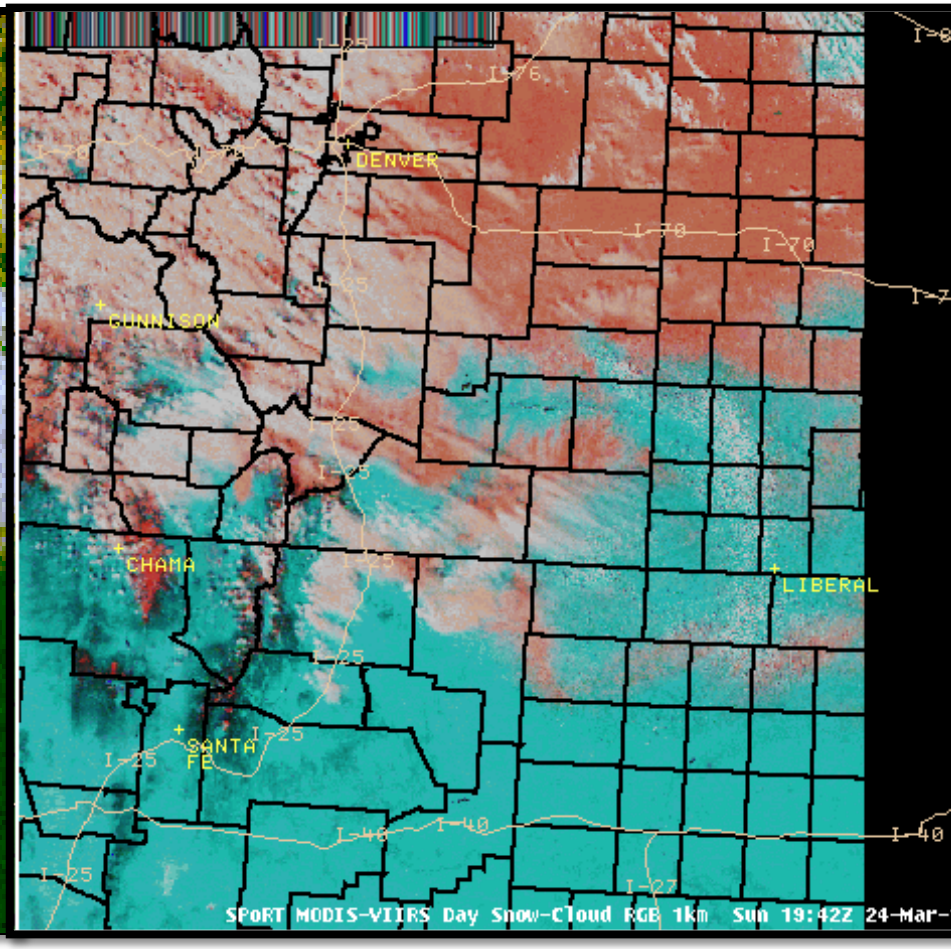
Steven D. Miller and Hiro Gosden

31 May 2013

Misrepresentation Issues

PG Online





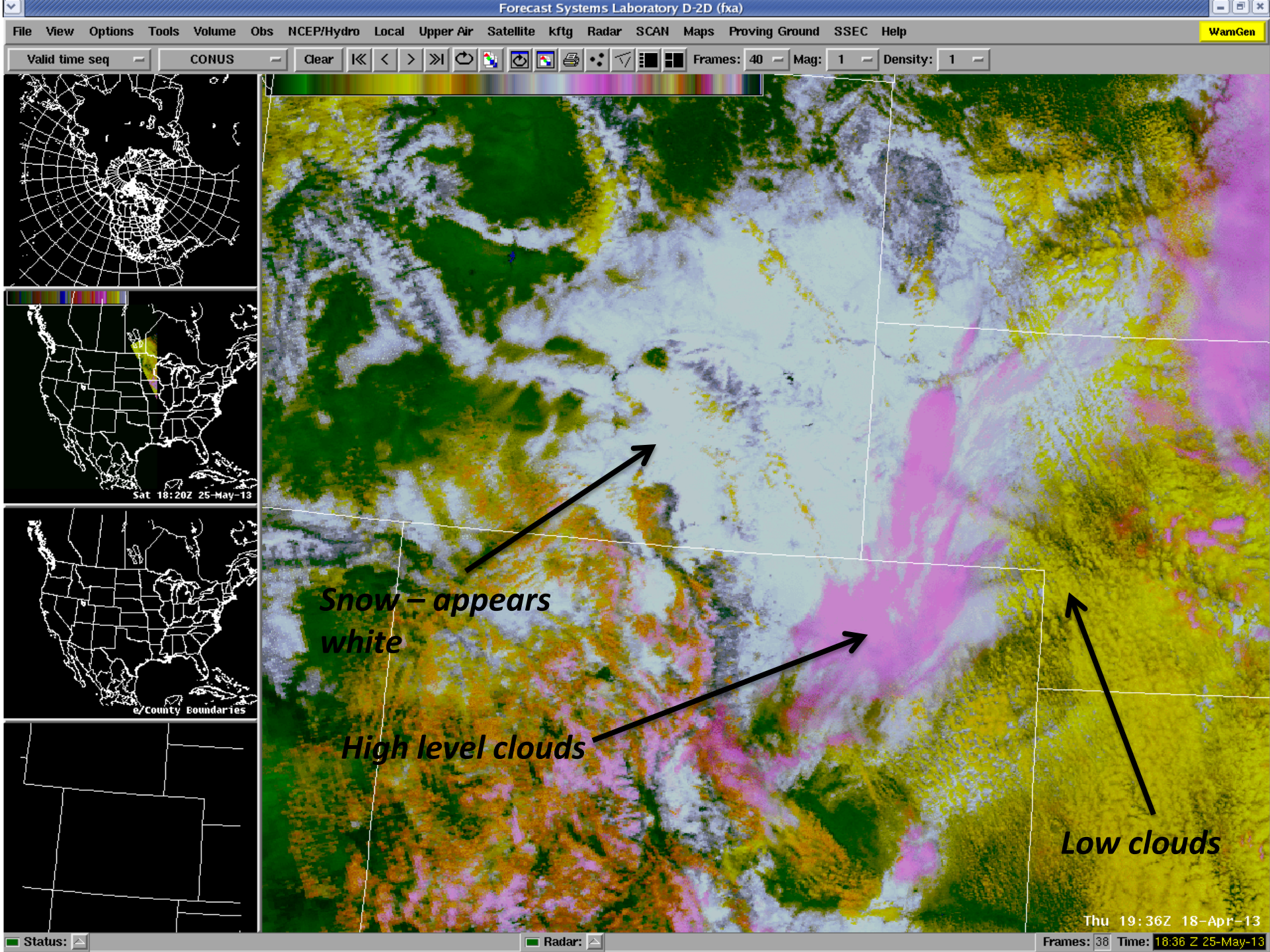
New, Reordered Color Table

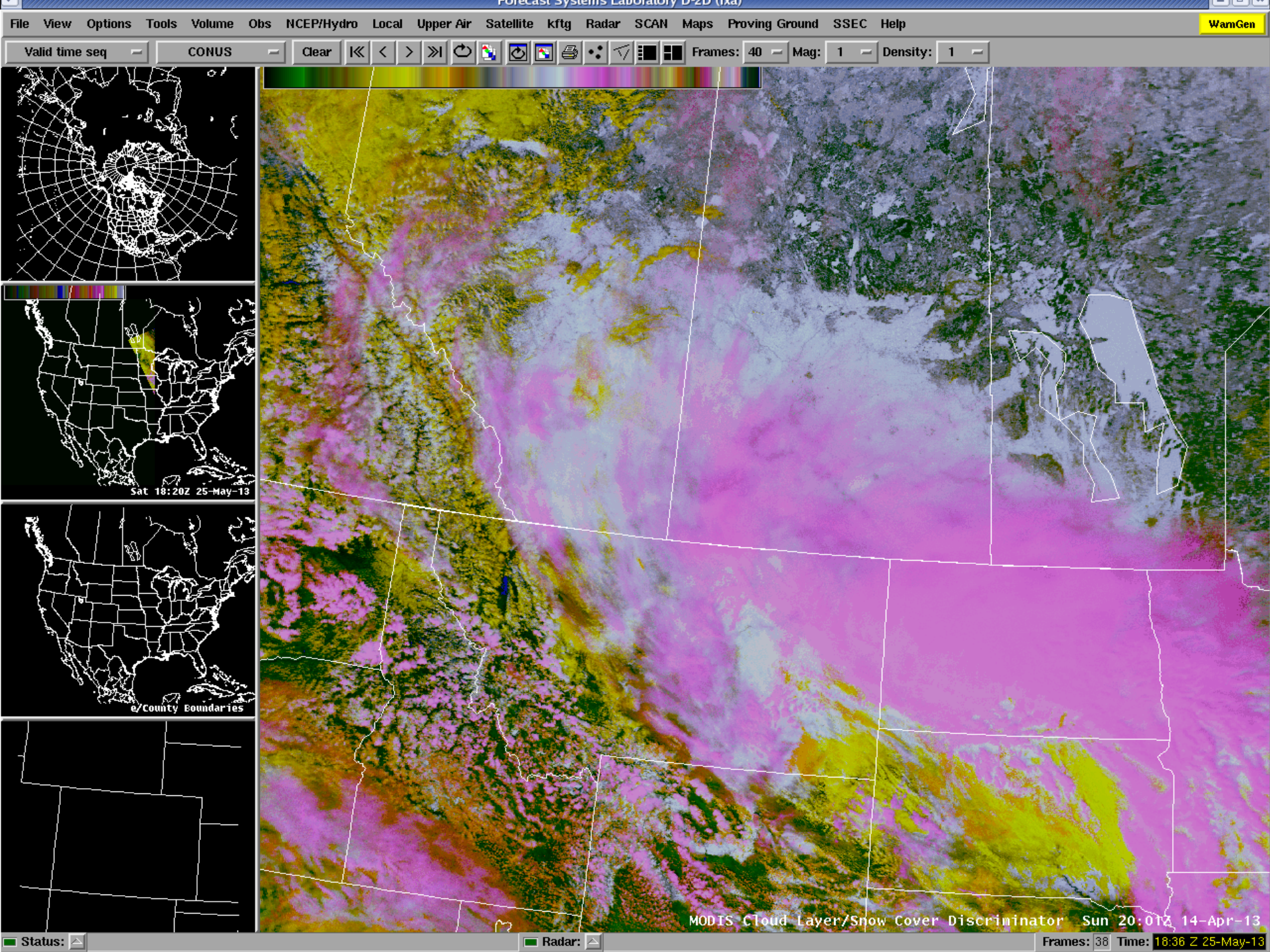
0 Current Operational LUT 256

Revised LUT

Revised & Reordered LUT

Examples of Correct Representation in AWIPS

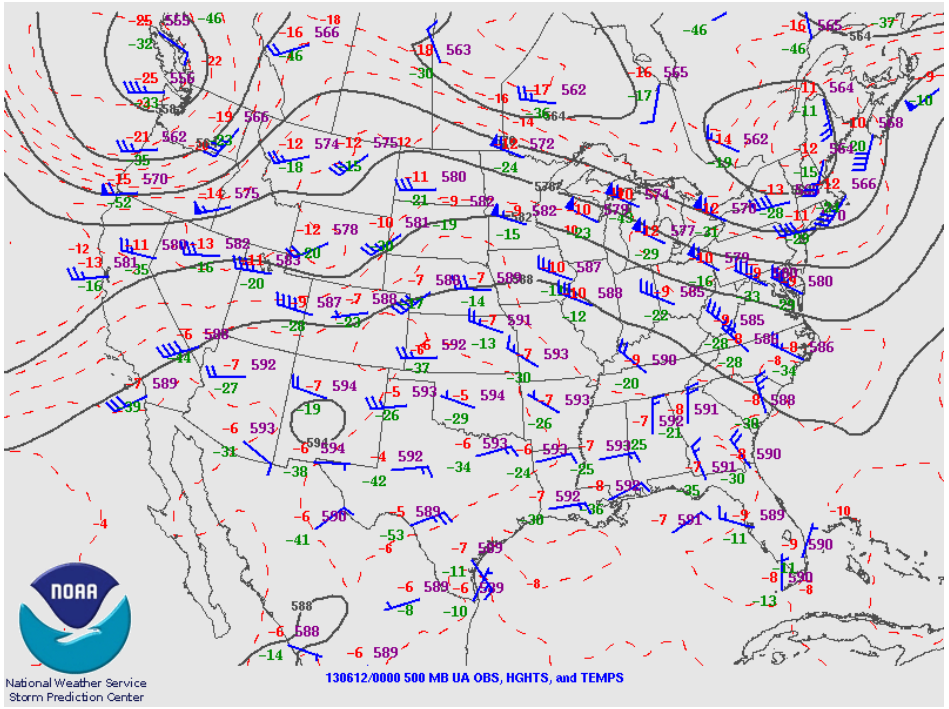

Forecast Systems Laboratory D-2D (fxa)
File View Options Tools Volume Obs NCEP/Hydro Local Upper Air Satellite Kftg Radar SCAN Maps Proving Ground SSEC Help
WarnGen
Valid time seq
CONUS
Clear
Frames: 40
Mag: 1
Density: 1
Sat 18:20Z 25-May-13
e/County Boundaries
Snow – appears white
High level clouds
Low clouds
Thu 19:36Z 18-Apr-13
Status:
Radar:
Frames: 38 Time: 18:36 Z 25-May-13


Forecast Systems Laboratory D-2D (ixa)
File View Options Tools Volume Obs NCEP/Hydro Local Upper Air Satellite kftg Radar SCAN Maps Proving Ground SSEC Help
WarnGen
Valid time seq
CONUS
Clear
Frames: 40
Mag: 1
Density: 1
Sat 18:20Z 25-May-13
e/County Boundaries
MODIS Cloud Layer/Snow Cover Discriminator Sun 20:0TZ 14-Apr-13
Status:
Radar:
Frames: 38
Time: 18:36 Z 25-May-13

Critical CO fire weather day on 11 June

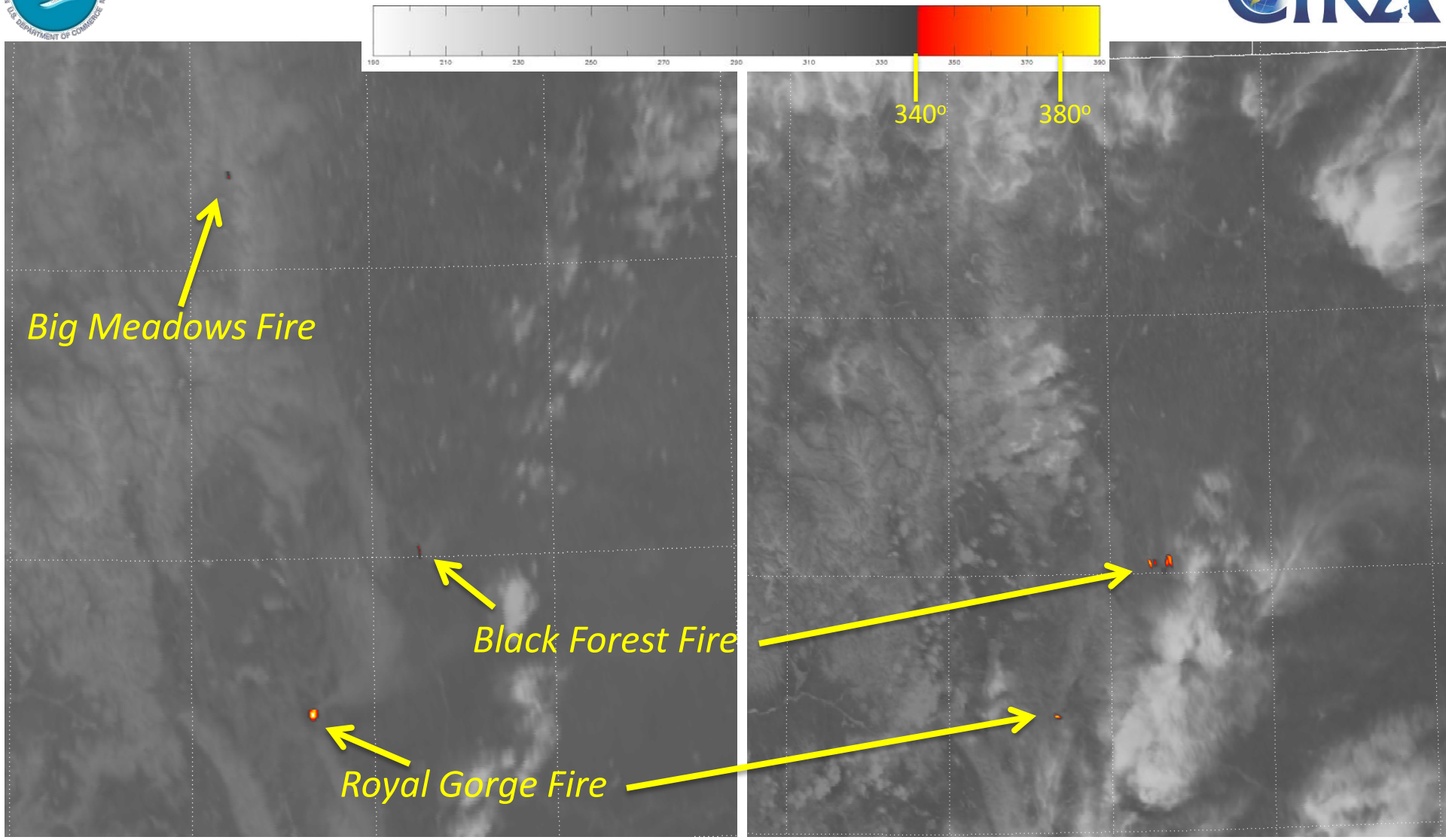
- Vigorous (for mid-June) shortwave trough passing by to the north of CO created extreme fire weather conditions on 11 June
  - Strong winds, extreme heat (100^{o} at DIA), dry (0^{o}F dewpoint) and windy
  - Also thunderstorms with little precipitation the previous day
- The most destructive fire was the Black Forest fire south of Denver

Black Forest fire on 11 June (from the Denver Post)



500 mb analysis at 00z/12 June

VIIRS fire detection imagery

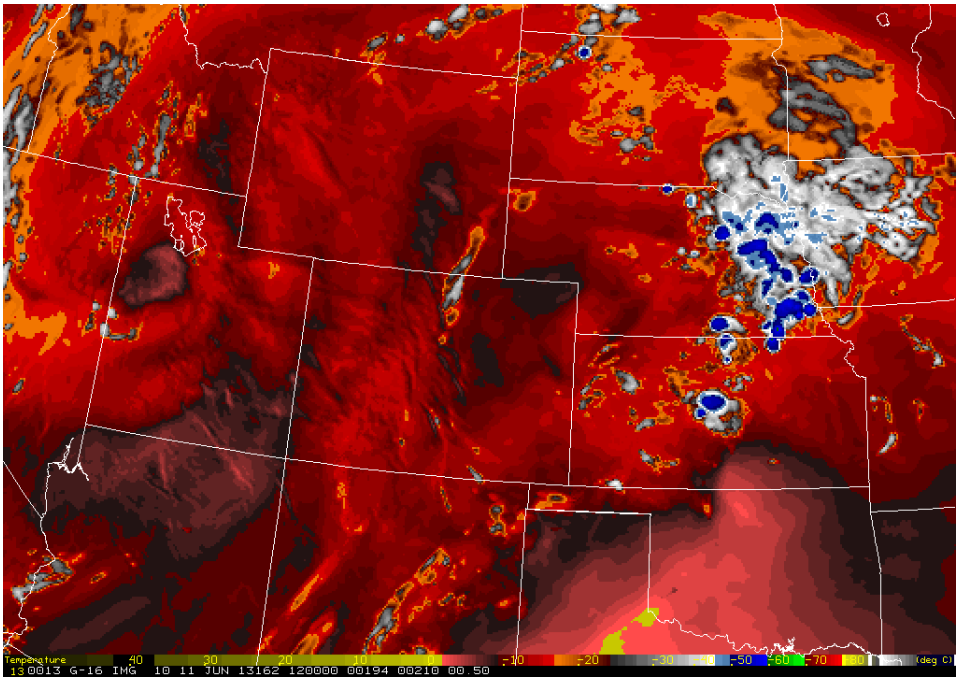


11 June 2036-41 UTC

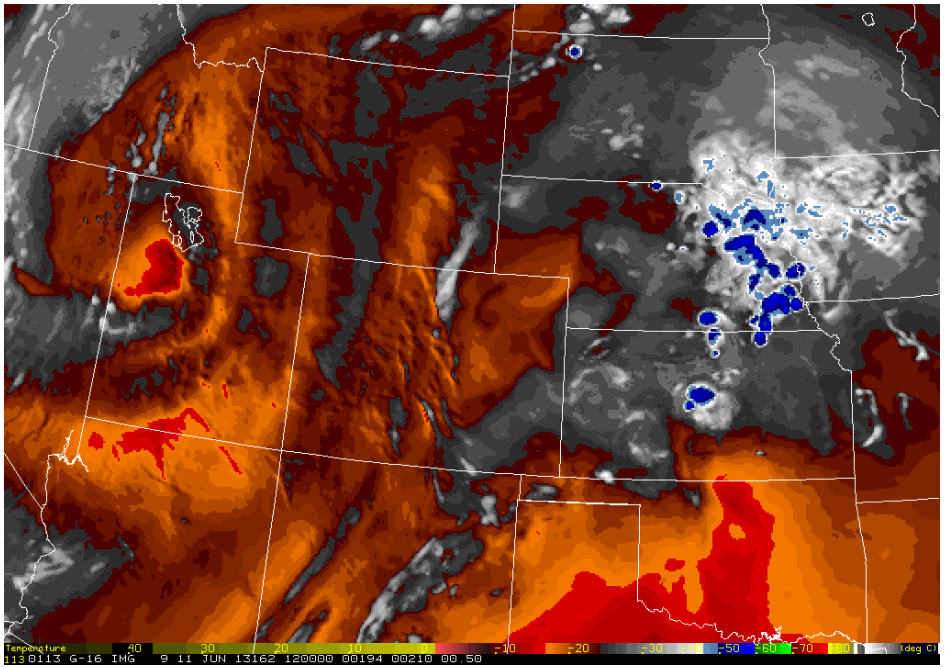
12 June 2018-22 UTC

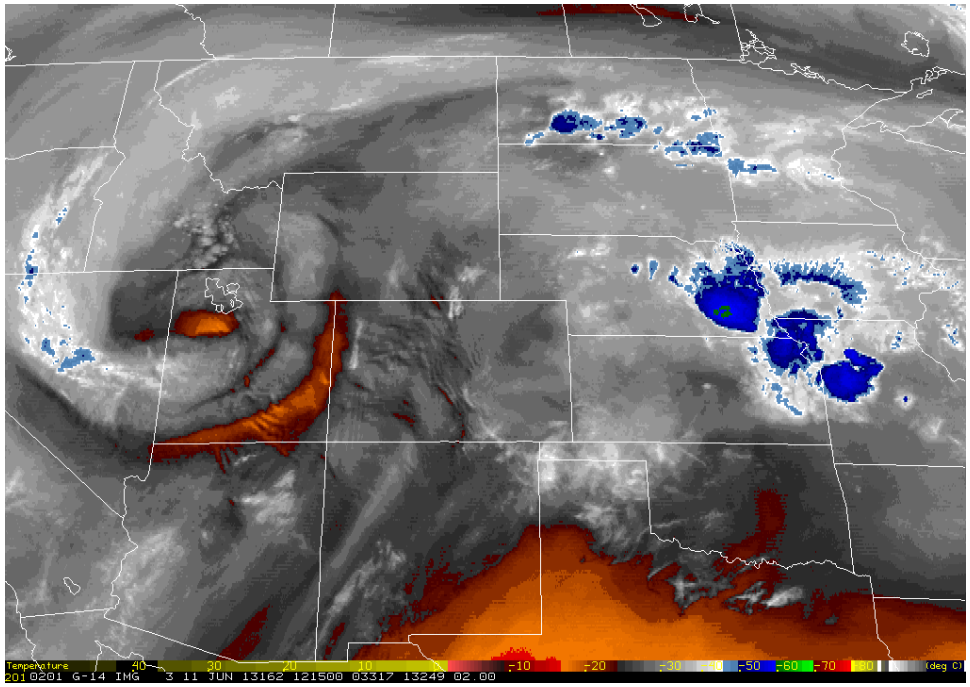
Explosive growth seen in 24-h with the Black Forest Fire. Clouds obscure the Big Meadows Fire on the 12th.

Simulated 7.34 µm



Simulated 6.95 µm



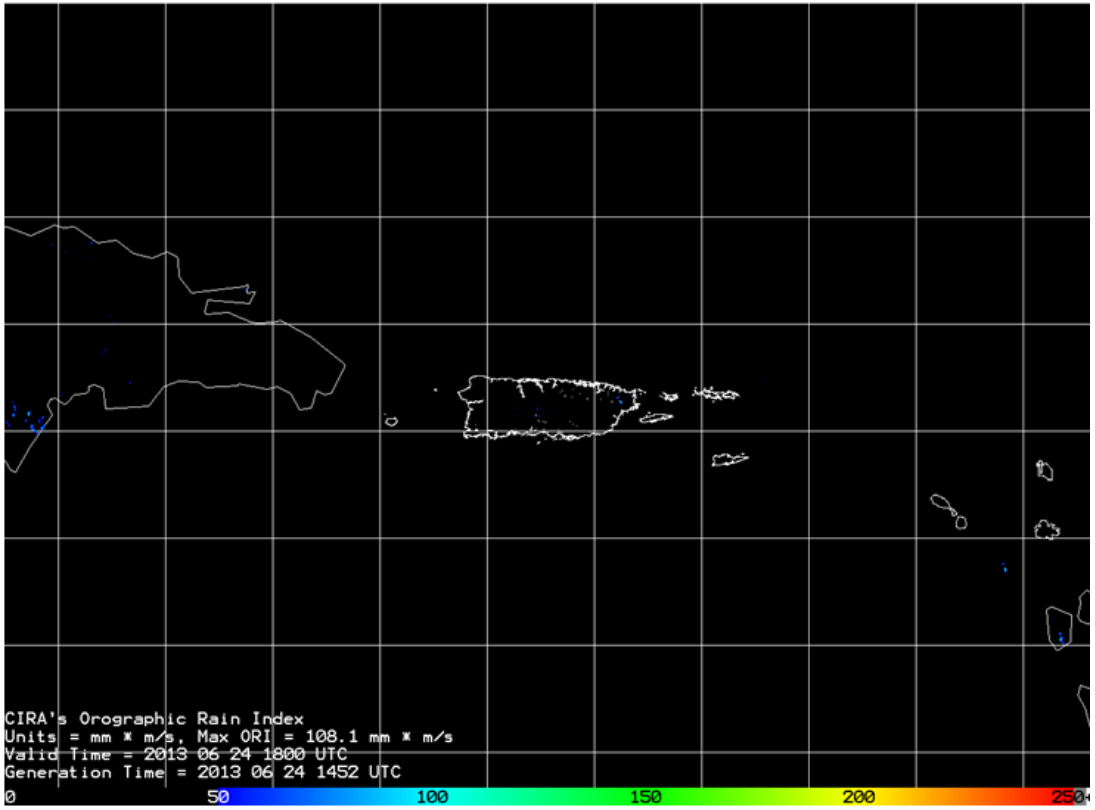


NSSL WRF simulated WV imagery, along with the observed GOES-14 imagery, from 11 June 2013 (hourly imagery from 1200 to 2300 UTC). Note the dramatic drying over Colorado during the afternoon hours, most evident in the 7.34 µm band, whose weighting function peaks lower in the atmosphere. Critical fire conditions occurred, and 3 significant wildfires started this day

Observed GOES-14 6.5 µm

ORI update

- We have almost completed a VISIT training module on ORI
- ORI is now available at the Honolulu WFO
  - Mark will be visiting the WFO and will use this for training
- ORI is now available on a Puerto Rico grid on AWIPS1
  - For Puerto Rico the GFS winds that are used are for a lower layer (1000-900 mb) per coordination with SOO Luis Ruiz

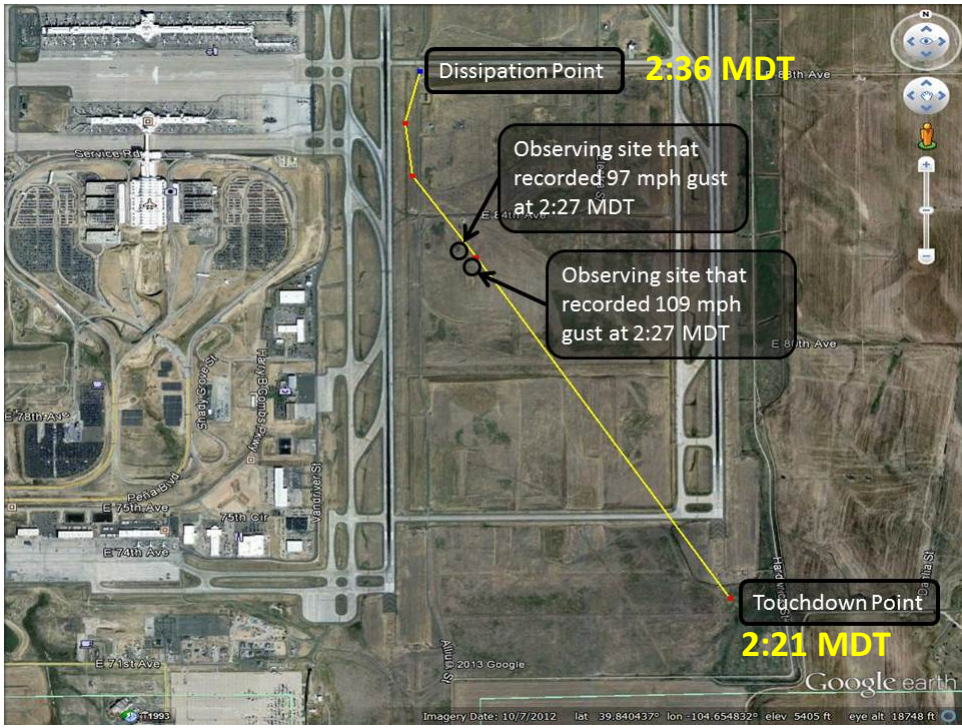


Sub-regional domain on AWIPS for Puerto Rico

Total Lightning data and the DIA tornado on 18 June

- A non-supercell tornado formed over Denver International Airport (DIA) along the DCVZ ("Denver Cyclone") in the early afternoon of 18 June
- First non-supercell opportunity to utilize total lightning data from the Colorado LMA network (available at BOU WFO via the web on a large screen display)
- Quick look at what we saw on radar and with the LMA data shown here
  - Tornado (EF-1) passed over LLWS site that recorded gust to 109 mph

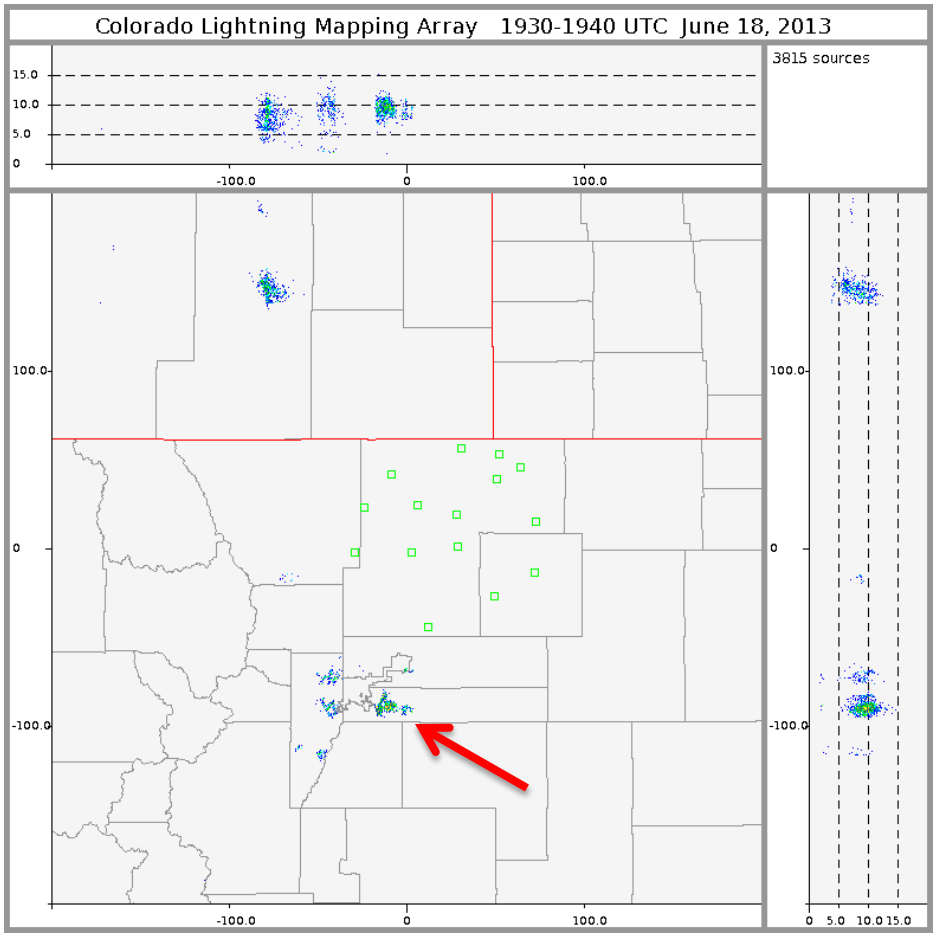
DIA tornado on the airport grounds



Tornado track courtesy of forecaster Dave Barjenbruch

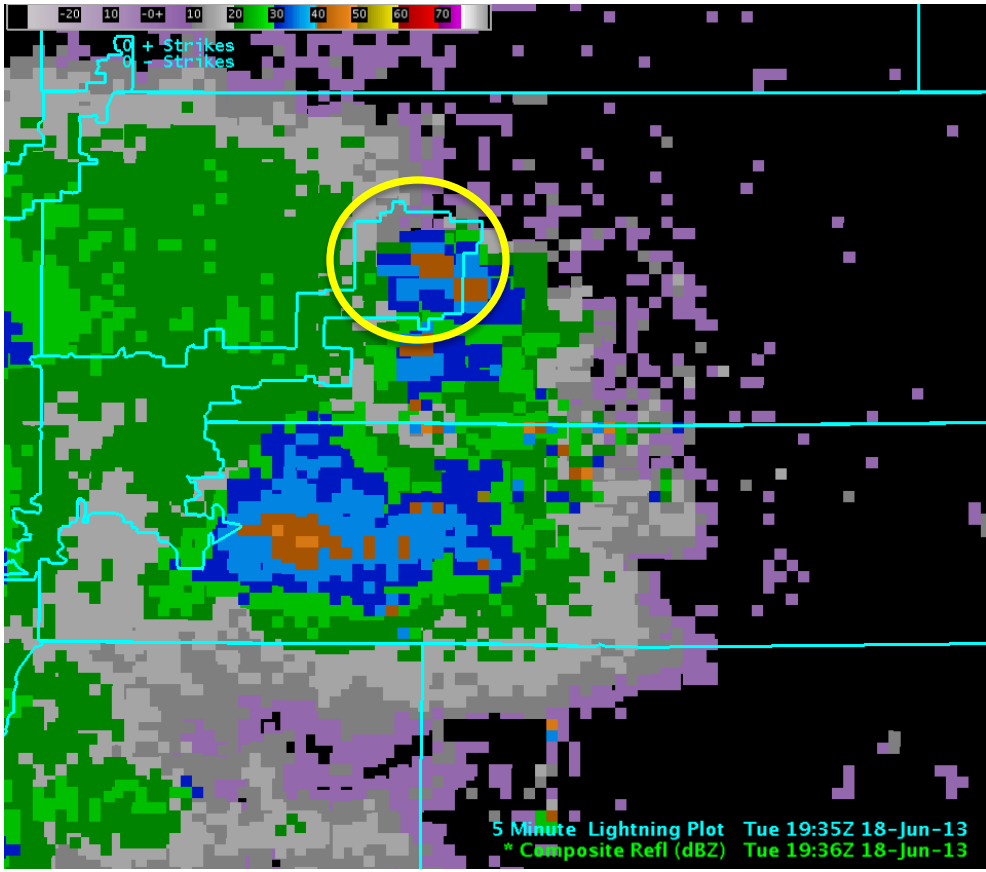
Total Lightning data and the DIA tornado on 18 June

- Radar was very close to the tornado
  - 88D ~7 miles away
  - Terminal Doppler radar (TDWR) ~11 miles away



CO LMA display 1930-40 UTC

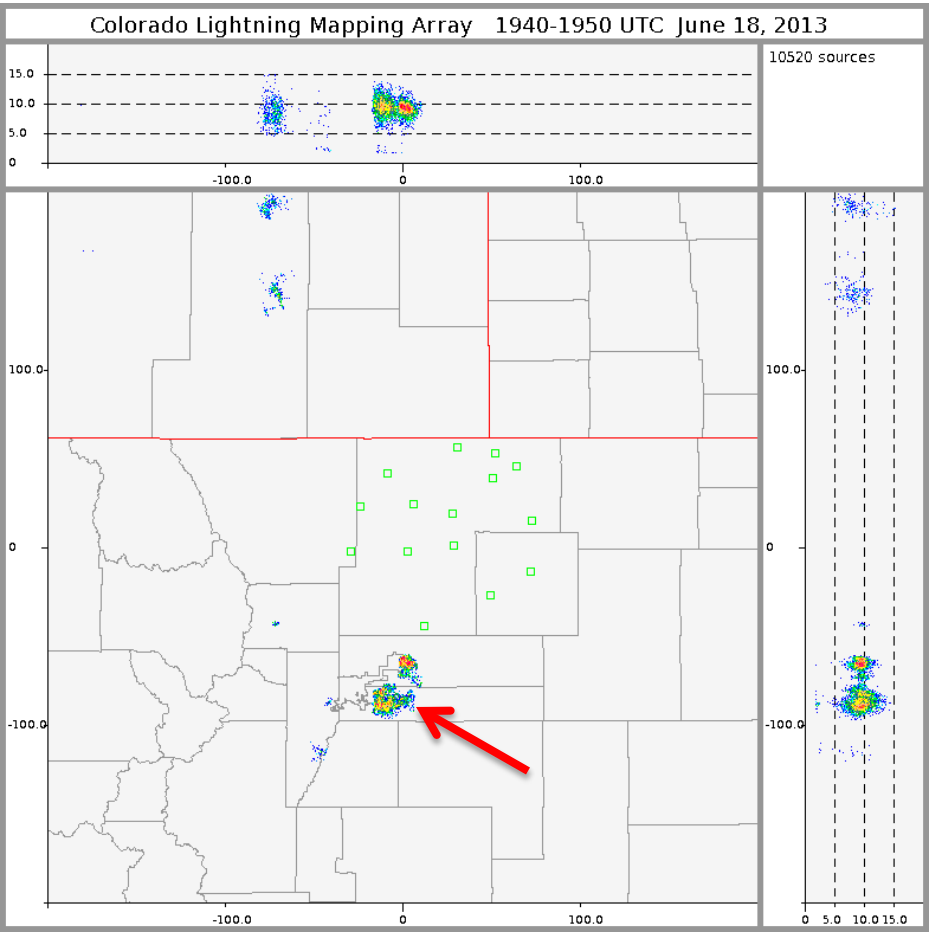
Composite Reflectivity from 88D at 1936 UTC



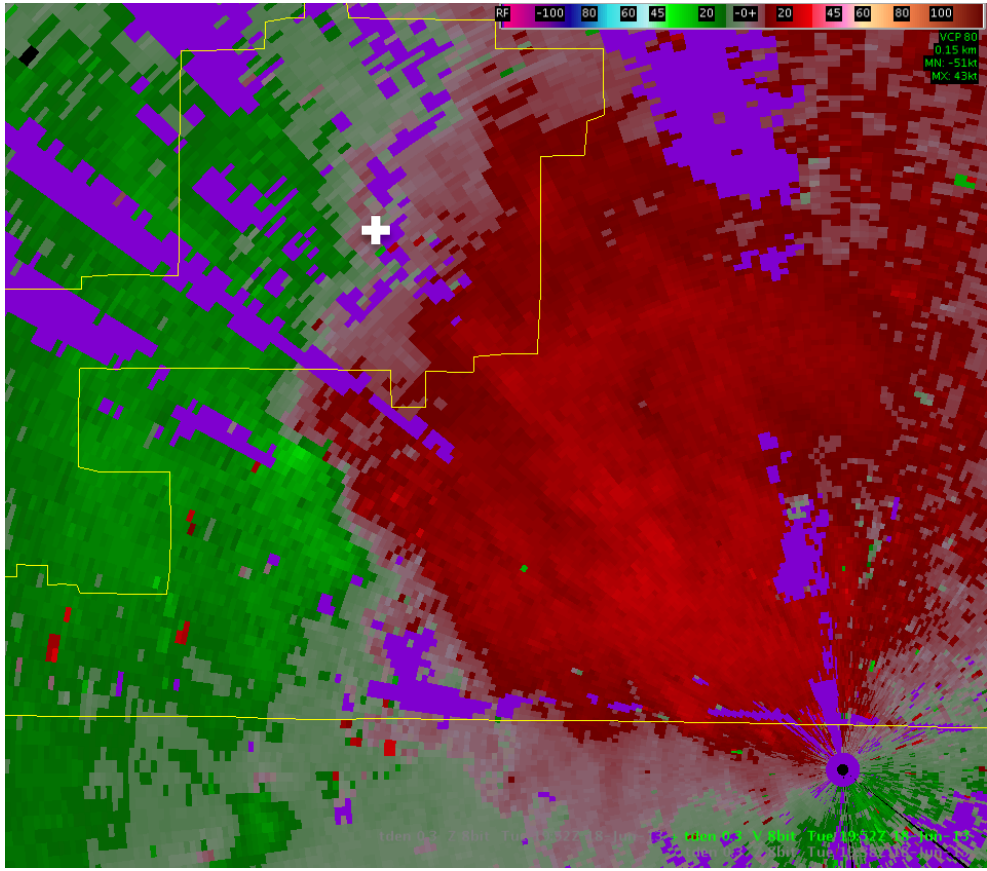
Composite Reflectivity shows echo aloft, and in-cloud lightning first seen but already increasing in same cell (arrow). No real circulation yet near the surface. DIA is within the yellow circle.

Total Lightning data and the DIA tornado on 18 June

CO LMA display 1940-50 UTC



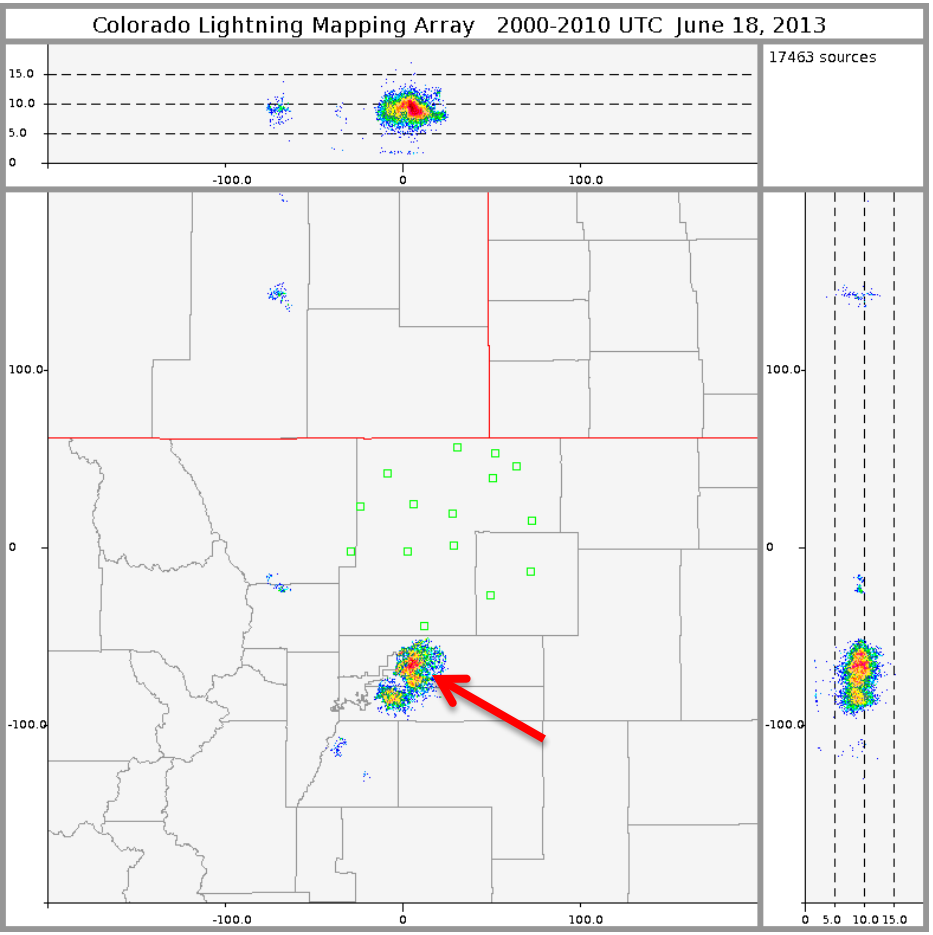
Velocity at 0.3° from TDWR at 1952 UTC



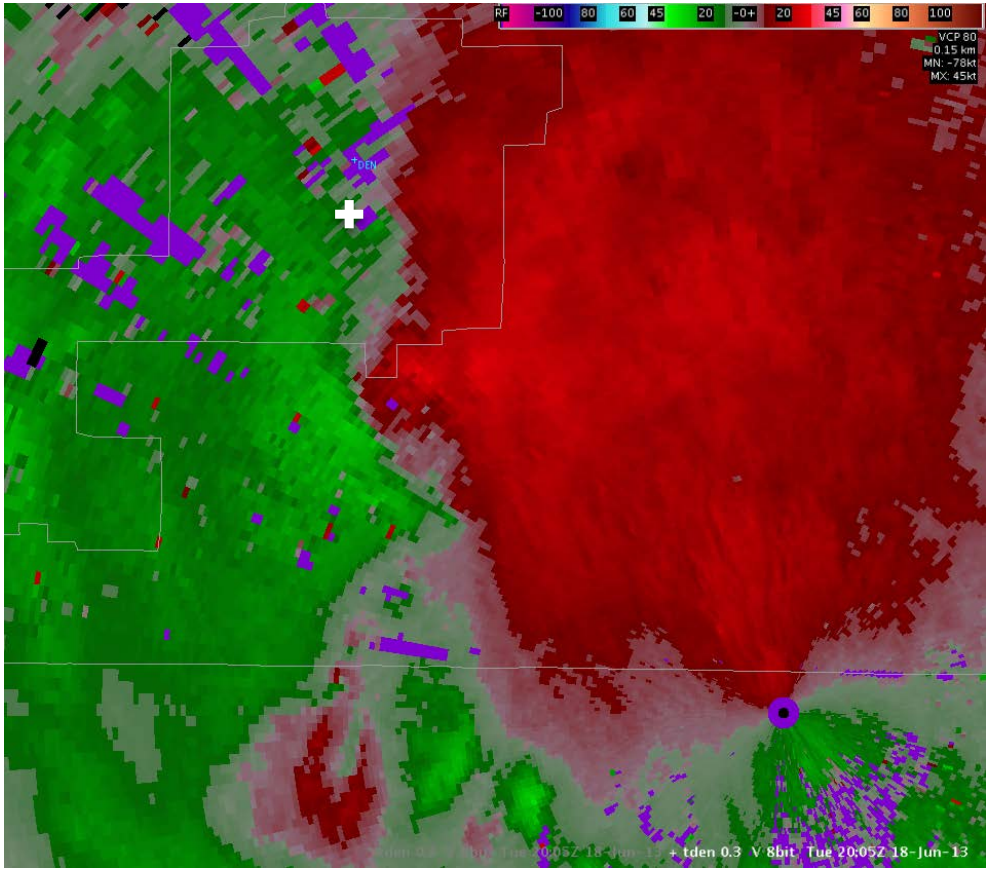
We start to see a circulation near the surface, meanwhile in-cloud lightning increasing rapidly (indicative of increasing updraft – a key to non-supercell tornadogenesis). Plus sign marks location of the DIA terminal.

Total Lightning data and the DIA tornado on 18 June

CO LMA display 2000-2010 UTC



Velocity at 0.3° from TDWR at 2005 UTC

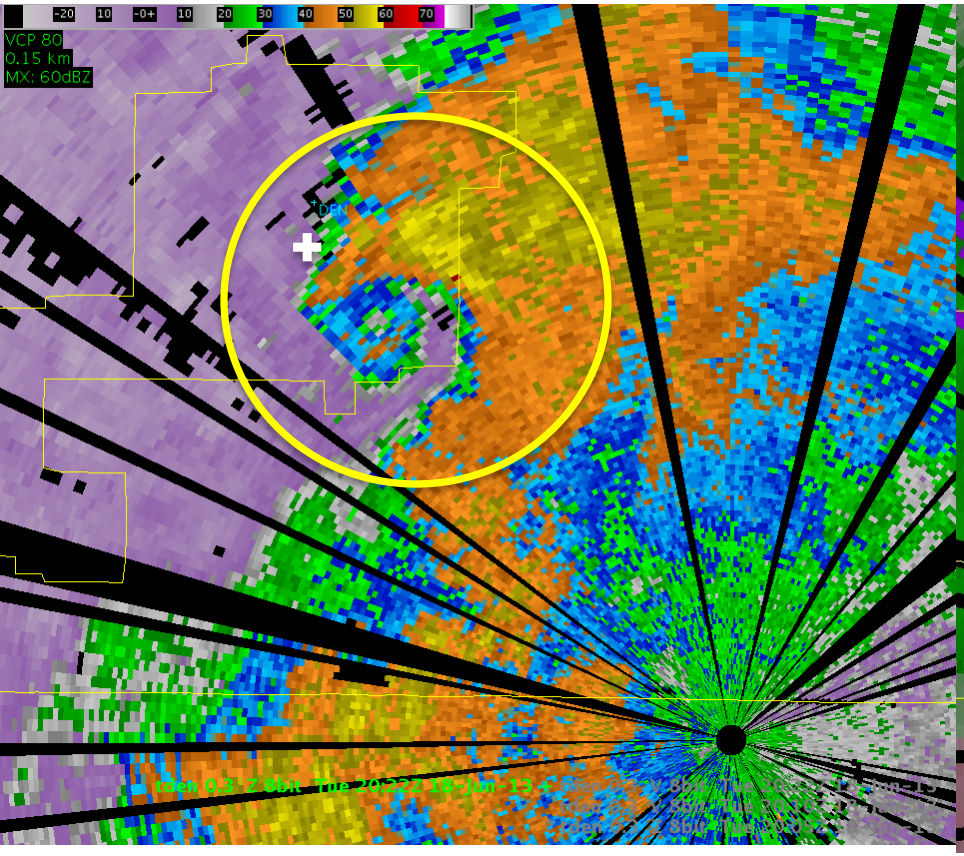


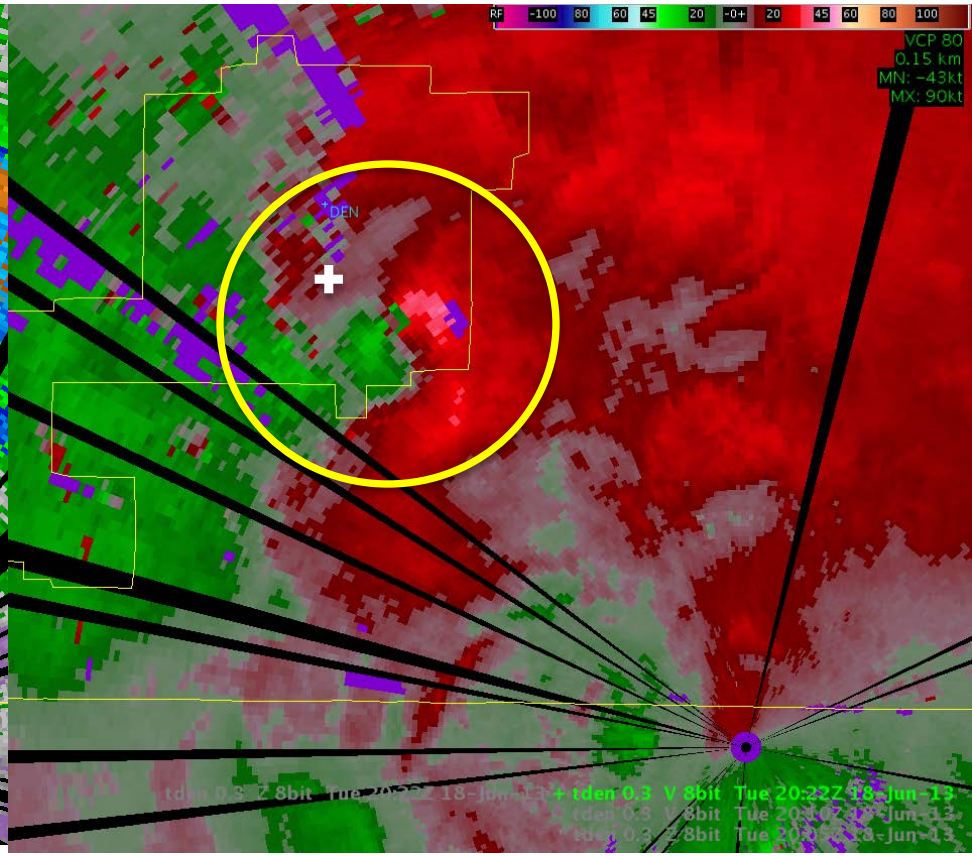
Increasing in-cloud lightning trend continues as circulation tightens, but still no confirmed tornado on the ground (warning is issued shortly after this time). Touchdown not confirmed until 2021 UTC.

Total Lightning data and the DIA tornado on 18 June

Reflectivity at 0.3° from TDWR at 2022 UTC

Velocity at 0.3° from TDWR at 2022 UTC





TDWR reflectivity and velocity image at 2022 UTC just after tornado was confirmed by DIA tower. Hook echo is seen in the reflectivity with shear in the velocity image = ~100 knots.

Systems Report

AWIPS1

AWIPS2

- **Software Change Request to Raytheon**
  - A CR has been submitted to allow for overwrite of satellite products in the AWIPS 2 postgres database. This is necessary to allow for updates of simulated satellite imagery as new model information is available.
  - Real-time west coast ORI product is now available in AWIPS2.

- **Working group participation**
  - Participation in the SPoRT led Experimental Products Development Team (EPDT) bi-weekly telecons is ongoing.
  - Participation in the monthly NDE-AWIPS telecons is ongoing.

Conferences / Meetings

Recent:

- **May 6 - 10** **SPC Spring Experiment - Louie Grasso**
- **June 17 – 21** **OCONUS Proving Ground Meeting in Fairbanks and Anchorage**
  Steve Miller

***Upcoming*:**

- **July 8 - 11** **Honolulu WFO - Mark DeMaria**
- **August 12 – 16** **Aviation Weather Center Testbed – Ed Szoke**

Thanks!

Questions..?