



# Hazardous Weather Testbed (HWT) activities of 2012, and Plans for 2013

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# Outline

- Hazardous Weather Testbed (HWT) 2012: numbers and facts
- Forecast Application Branch's participation, and products
- Forecast continues, a few examples of products available on the web
- Plans for 2013



# Hazardous Weather Testbed (HWT) 2012

- Goal: Focused on Severe Weather and Convective Initiation
- By the numbers...
  - 6-week period (7 May – 15 June)
  - 28 NWS forecasters: WFOs and CWSUs
  - 18 visiting scientists: AFWA, CIMSS, CIRA, CIRES, DWD, SPoRT, UAH
  - 6 Proving Ground products: generated from Satellite based, land-based, and numerical model based datasets
  - 225 blog posts: Majority from NWS forecasters
  - Weekly webinar...



# HWT 2012, Forecast Application Branch's Participation

## 1. LAPS analysis and forecast products: 15 min composite radar reflectivity

- CONUS domain at 3 km resolution, and 15 min update cycle, forecast is initialized at 00z, out to 6 hrs.
- To examine data assimilation sensitivities
- Displayed in the 6 panel comparison page, used in discussion daily

## 2. Variational LAPS (STMAS) surface analysis: wind, T, $T_d$ , RH, MSLP, etc

- CONUS domain at 2.5km resolution, and 15 min update cycle,
- GRIB-2 files were made available to Norman for display on ALPS workstation

## 3. LAPS\_OUN - analysis: CAPE, CIN, HELICITY, Composite Reflectivity, etc

- Smaller domain at 1km resolution, and 15 min update cycle,
- GRIB-2 files were made available to Norman for display on ALPS workstation



## HWT 2012, Forecast Application Branch's Participation

4. Forecast continues to run in two HWT (CAPS) domains initialized using traditional LAPS and variational LAPS (STMAS), respectively

- Forecast out to 8hrs, and cycled every 6 hrs.
- Output at every 15 min
- Verification against advection model, persistence, 11  $\mu\text{m}$  IR Satellite, HRRR, etc routinely
- Available on-the-fly : <http://laps.noaa.gov/request/nph-laps.cgi>

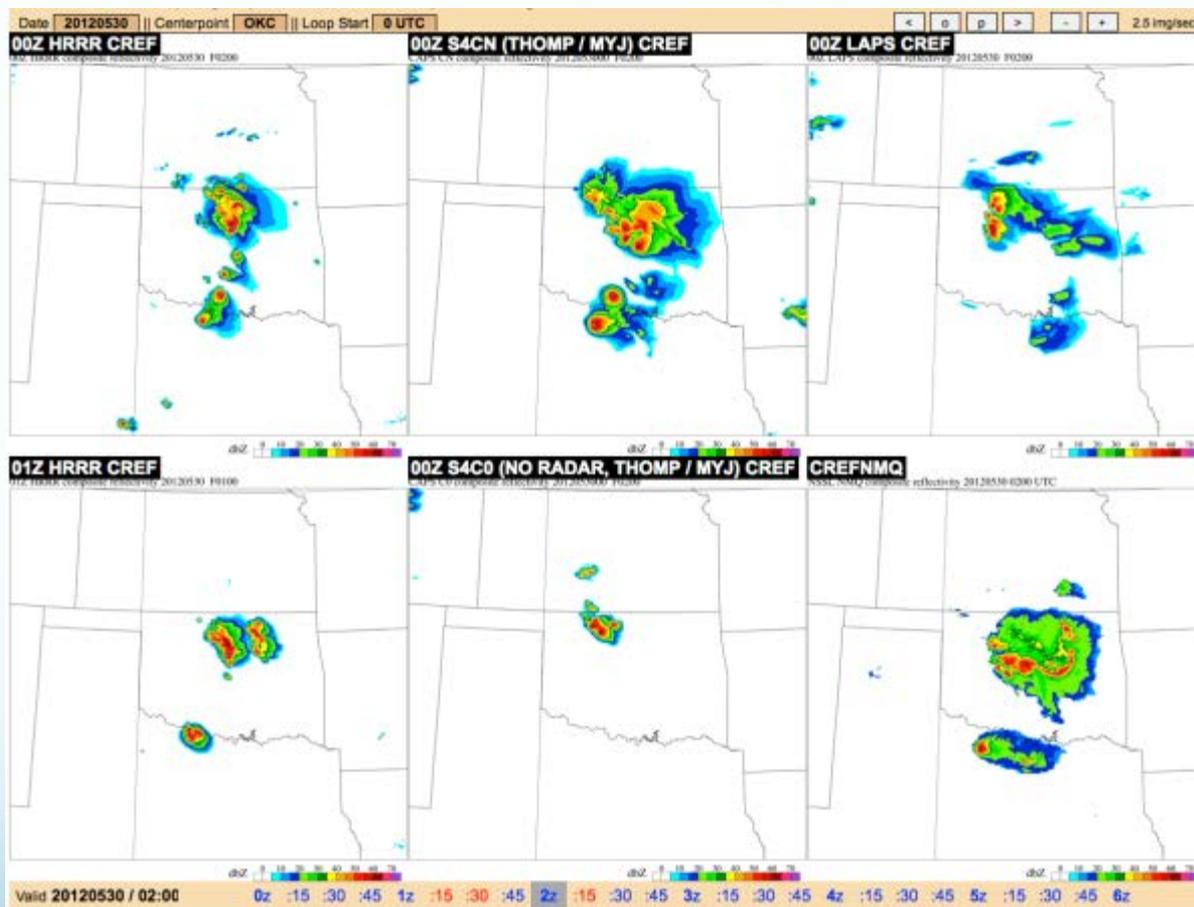


# HWT 2012: LAPS products – an example

## 15 min composite radar reflectivity, 6h FCST

initial time: 05/30/2012 00UTC, valid: 05/30/2012 02UTC

CAPS CN



HRRR 00z

LAPS 00z

HRRR 01z

CREFNMQ  
(composite ref  
derived from 3d  
Mosaic grid)

CAPS C0

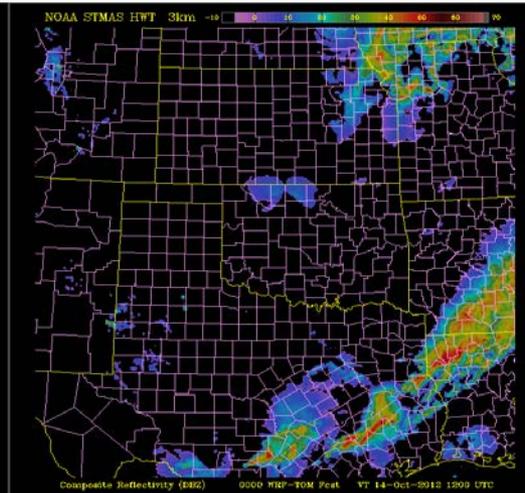
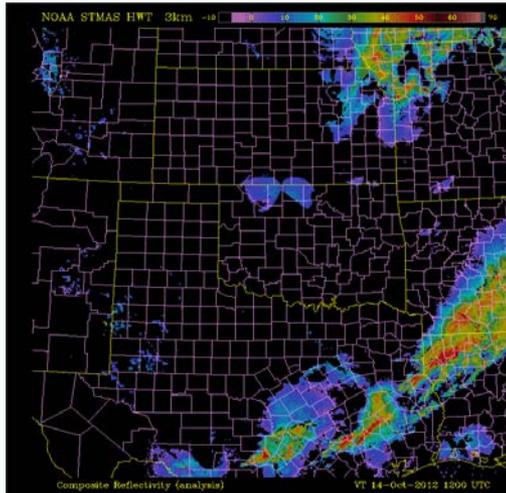


HWT domains: forecast continue to run at 3 km resolution

# Composite Radar Reflectivity

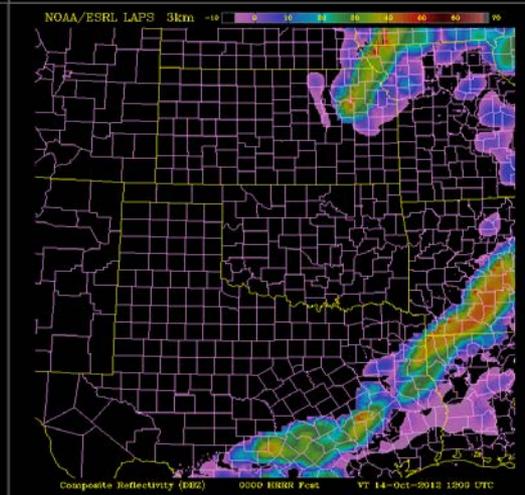
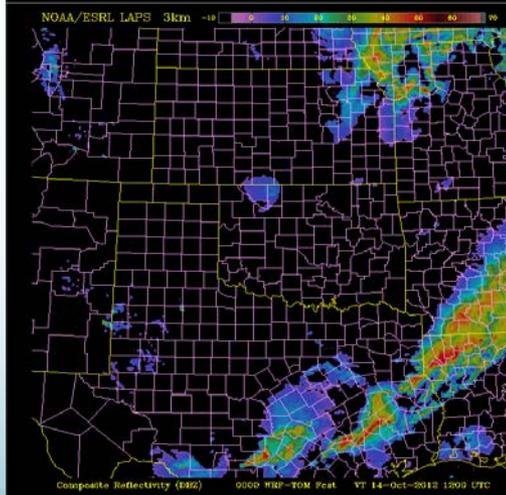
initialized 10/14/2012 12:00UTC, 6h forecast

Analysis



Variational  
LAPS

LAPS



HRRR



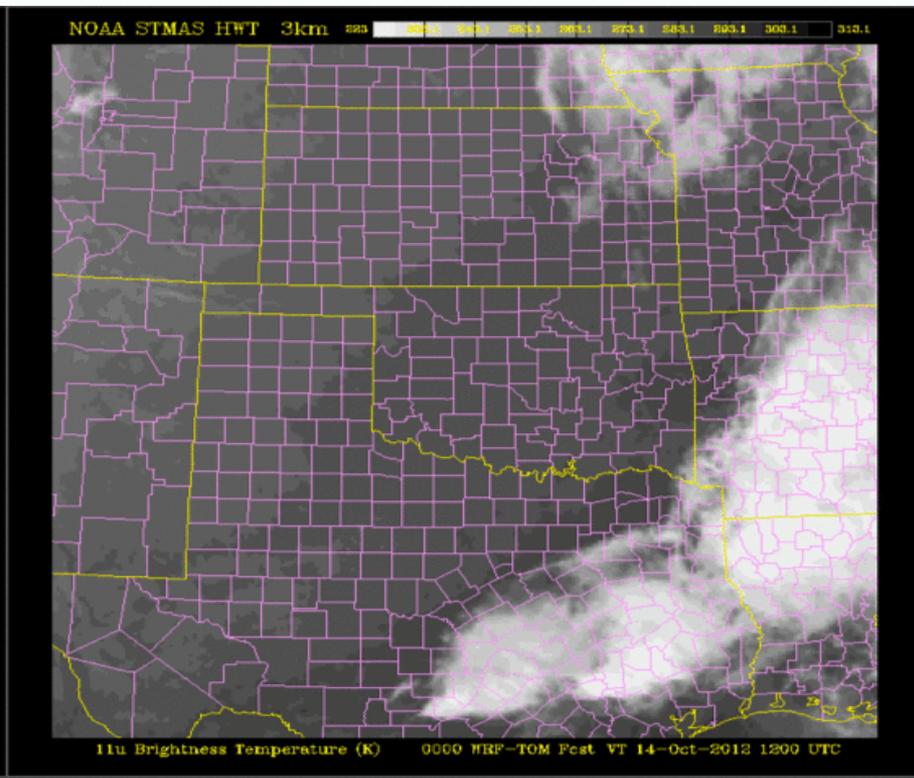
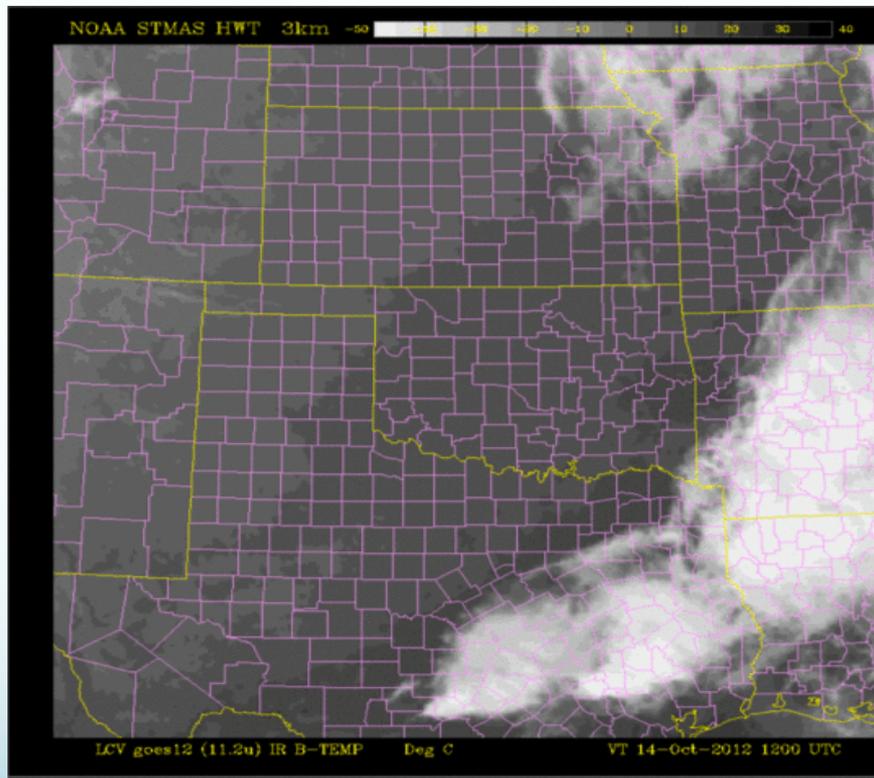
HWT domain other product:

## Simulated IR Satellite vs. Forecast

initialized 10/14/2012 12:00UTC, 6h fcst (shown 3h)

Observed / 15 min

Variational LAPS Forecast

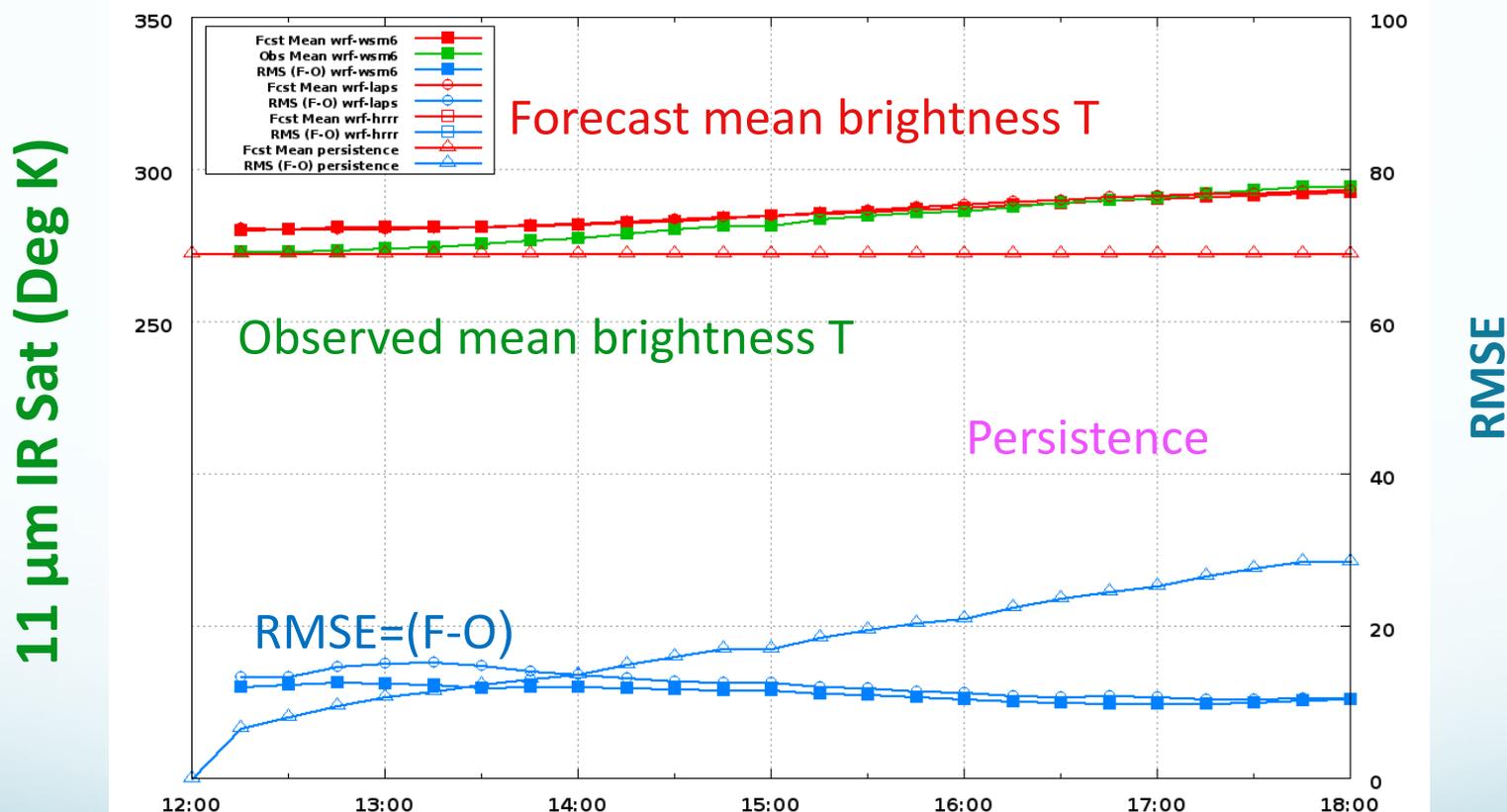


[HWT forecasts available at http://laps.noaa.gov/forecasts/](http://laps.noaa.gov/forecasts/)



# HWT domain: Verification

## 11 $\mu\text{m}$ IR Sat Observed vs. Forecast



Initialized 10/14/2012 12:00 UTC, 6 h forecast



# HWT 2012 Summary

1. We had very positive experience in participation in the 2012 Spring Hazardous Weather Testbed (HWT) activities, and plan to join the HWT 2013 Spring experiment
2. We are actively working on the improvement of variational humidity analysis, cloud analysis in the variational LAPS (STMAS) to improve forecast initiation in the Warn-on-Forecast environment
1. We are implementing the variational LAPS to a terrain-following, sigma-height grid



# Plans for Spring HWT 2013 (tentative)

## Warn-on-Forecast:

1. Set up a domain with high res, frequently updated analysis cycle:
  - Using the current HWT domain as a bench mark, 1 km resolution, cycled at 1h, forecast out 2 hrs.
  - Analysis updated at every 15 min
  - Experimenting with 1 min GOES-R, and Phase Array Radar (PAR) data
  - Output at every 15 min
2. Deploy movable analysis and forecast domain:
  - Domain selection is made by the Experimental Warning Program (EWP) team, based on the large-scale overview, analysis of upper air, surface data on the daily basis, and feedback to us via text message
3. Feed data into AWIPS II
4. Demonstrate temperature adjustment after precipitation events (e.g. 24 hrs. later)



Thank you!