



GOES-R Proving Ground Demonstrating GOES-R products in 2011

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NWS/OS&T in Support of GOES-R**

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The W's That Make Up My Outline



- What is the Proving Ground?
- Who makes up the Proving Ground?
- Where is the Proving Ground?
- What has been demonstrated within the Proving Ground in 2011?
- Where is the Proving Ground going in 2012?



GOES-R Proving Ground (PG) Overview



- Demonstrates GOES-R capabilities within the National Weather Service (NWS) including the National Centers for Environmental Prediction (NCEP), NWS Regions, and NWS Weather Forecast Offices (WFOs) to achieve Day-1 User Readiness while addressing operational needs
- Addresses National Research Council “Crossing the Valley of Death” Report
 - Utilizes current systems (satellite, terrestrial, or model/synthetic) to emulate future GOES-R capabilities
 - Infuses GOES-R-like products and decision aids into NWS operations with an emphasis on Advanced Weather Interactive Processing System (AWIPS) and transitioning to AWIPS-II
 - Allows forecasters and other users to assess significant new GOES-R capabilities and provide valuable feedback to the developers

It is critical for the transition from research to operations and mission success to start early with product demonstrations, assessment, and feedback on product utility



Participants

Executive Board

Oversees the PG Program

Representation From:
AWG, CIMSS, CIRA,
GPO, NESDIS, NWS,
NASA SPoRT*
(*through 2011)

Provider

An organization that produces/provides the products for demonstration

Example:
NESDIS/STAR & RAMMB,
CIMSS, CIRA, CIMMS,
NASA SPoRT

Consumer

An organization that conducts/executes product demonstrations

Example:
NWS National Centers,
NOAA Testbeds, NWS WFOs

Satellite Liaisons

Technical liaisons at select locations that:

- Actively participate in product demonstrations
- Interpret added value of the satellite-derived information
- Conduct training
- Work with the developers to build capacity within the forecast office or national center



AWG-Algorithm Working Group | **CIMMS**-Cooperative Institute for Mesoscale Meteorological Studies | **CIMSS**-Cooperative Institute for Meteorological Satellite Studies | **CIRA**-Cooperative Institute for Research in the Atmosphere | **GPO**-GOES-R Program Office | **NASA**-National Aeronautics and Space Administration | **NESDIS**-National Environmental Satellite, Data, and Information Service | **RAMMB**-Regional and Mesoscale Meteorology Branch | **SPoRT**-Short-term Prediction Research and Transition Center | **STAR**-Center for Satellite Applications and Research



GOES-R Proving Ground

2011 Providers (☆) and Consumers (◇)

- National Weather Service Weather Forecast Offices
- National Centers for Environmental Prediction
- NOAA Testbeds
- National Interagency Fire Center
- State/Local Air Quality Forecasters



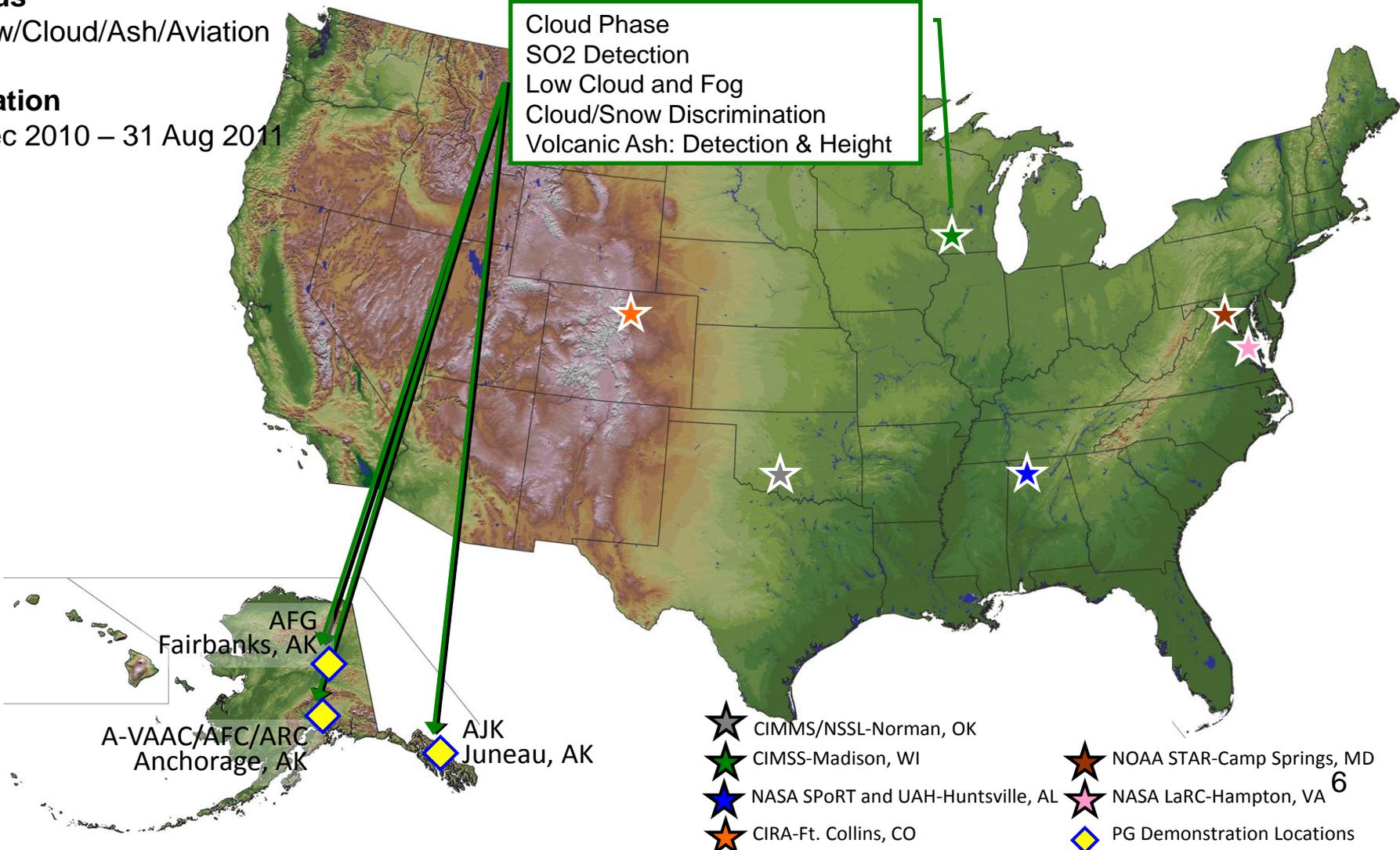
- ☆ CIMMS/NSSL-Norman, OK
- ☆ CIMSS-Madison, WI
- ☆ NASA SPoRT and UAH-Huntsville, AL
- ☆ CIRA-Ft. Collins, CO
- ☆ NOAA STAR-Camp Springs, MD
- ☆ NASA LaRC-Hampton, VA
- ◇ PG Demonstration Locations

High Latitude and Arctic

Focus
Snow/Cloud/Ash/Aviation

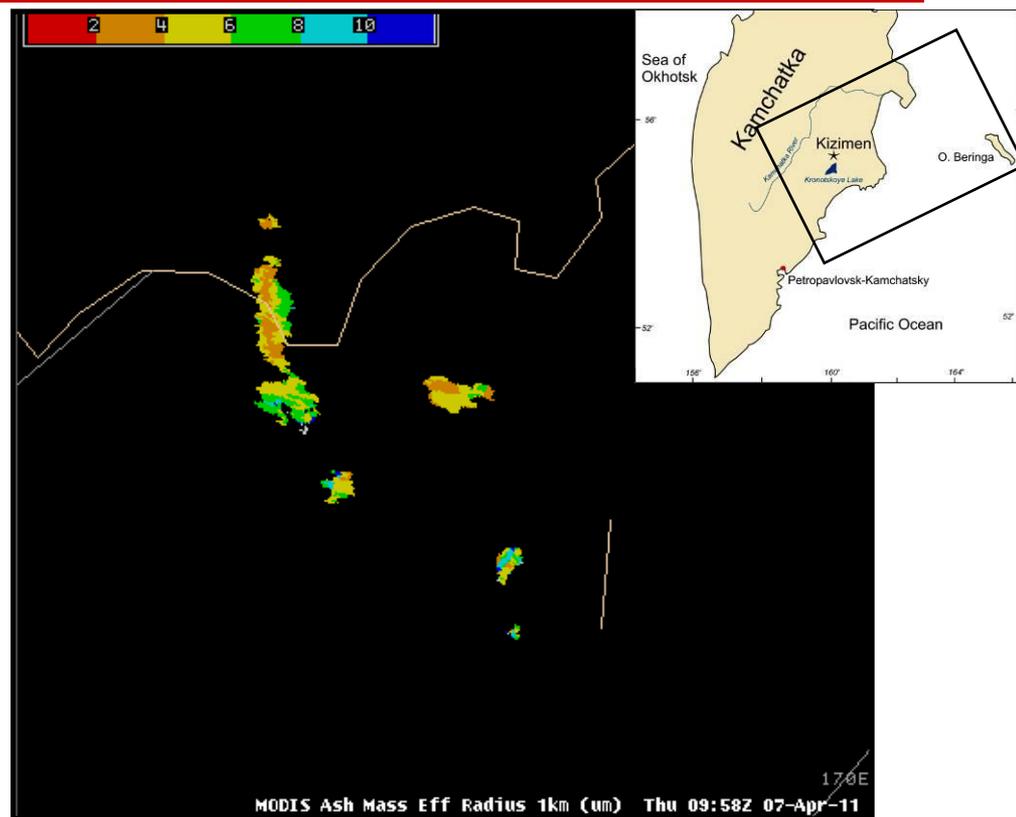
Duration
6 Dec 2010 – 31 Aug 2011

- Cloud Phase
- SO₂ Detection
- Low Cloud and Fog
- Cloud/Snow Discrimination
- Volcanic Ash: Detection & Height



High Latitude and Arctic Kamchatka Volcanoes – Spring 2011

- Volcanic ash products
 - In AWIPS in NWS Alaska WFOs and AK Aviation Weather Unit
- 2 Events
 - March 29th, 2011: eruption of Kizimen Volcano
 - April 7th, 2011: Kizimen and Sheveluch Volcano Event
- Forecaster Feedback
 - “The ash heights from Kizimen were in good agreement, not only with Tokyo VAAC who was doing the forecasting, but also with the wind analysis from 500mb winds.” Nathan Eckstein, Anchorage VAAC SOO



GOES-R Ash Effective Radius Product using MODIS imagery. 0958Z 7 April 2011. Much of the ash detected shows moderate size ash particles which gives forecasters an idea of atmospheric residency times. In this particular case, ash was detectable for longer than expected given the relatively low heights.



IMET Workshop

GOES-R PG Demonstration



Focus
Fire Weather

Duration
21-24 March 2011



- ★ CIMMS/NSSL-Norman, OK
- ★ CIMSS-Madison, WI
- ★ NOAA STAR-Camp Springs, MD
- ★ NASA SPoRT and UAH-Huntsville, AL
- ★ NASA LaRC-Hampton, VA
- ★ CIRA-Ft. Collins, CO
- ★ PG Demonstration Locations

IMET Workshop 3/2011

GOES-R PG Demonstration

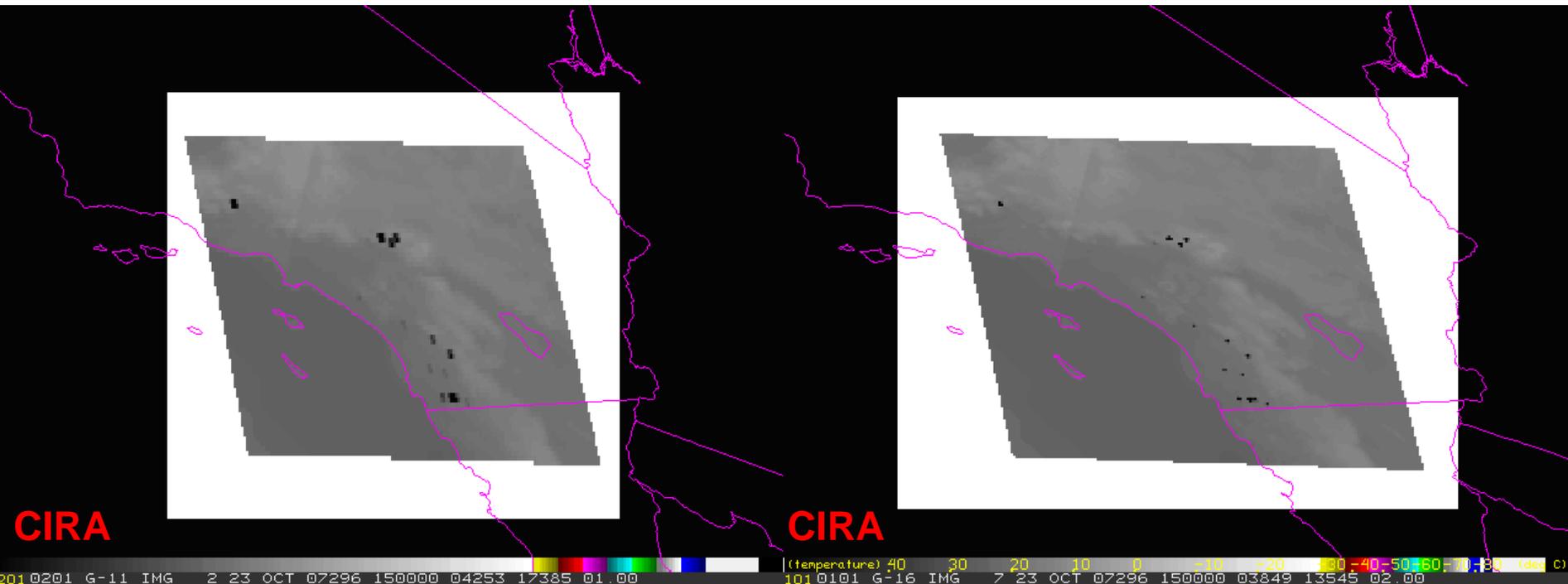
- Extracted 10 Incident Meteorologists (IMETs) and 2 Fire Behavior Analysts (FBANs) from the workshop and challenged them to develop 2 4-hour forecasts for the 2007 Witch Fire based on data and tools provided.
- Data
 - Group 1: Archived GOES West datasets
 - Group 2: Synthetic GOES-R datasets
 - Groups 1&2: Archived observations and model data
- Tools
 - FX-Net with data loaded
 - Topography maps of the area
- Objective
 - To determine whether the higher spatial/temporal/spectral resolution with the synthetic GOES-R data would provide a “better” forecast and to observe the differences between the two datasets.
- Forecaster Feedback
 - Inquired about bounds of 2.25 micron temps, knowing that 2.25 micron channel shows features when 3.9 micron saturated
 - Pointed out that heat signature on GOES-R showed fire burning eastward and uphill, depicting potential shift in wind direction
 - Pointed out that high res 10.35 micron imagery showed erosion of marine influence (GOES-R Team)
 - Saw the potential of GOES-R to help with analysis of light fuel areas



IMET Workshop 3/2011

California fire simulations 2007-10-23

Current-GOES vs. GOES-R ABI



GOES-11 (GOES-west)
Imager band-2 (3.9 μm)

GOES-R (at GOES-west location)
ABI band-7 (3.9 μm)

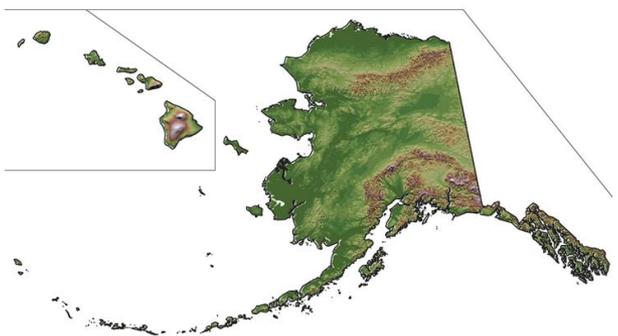
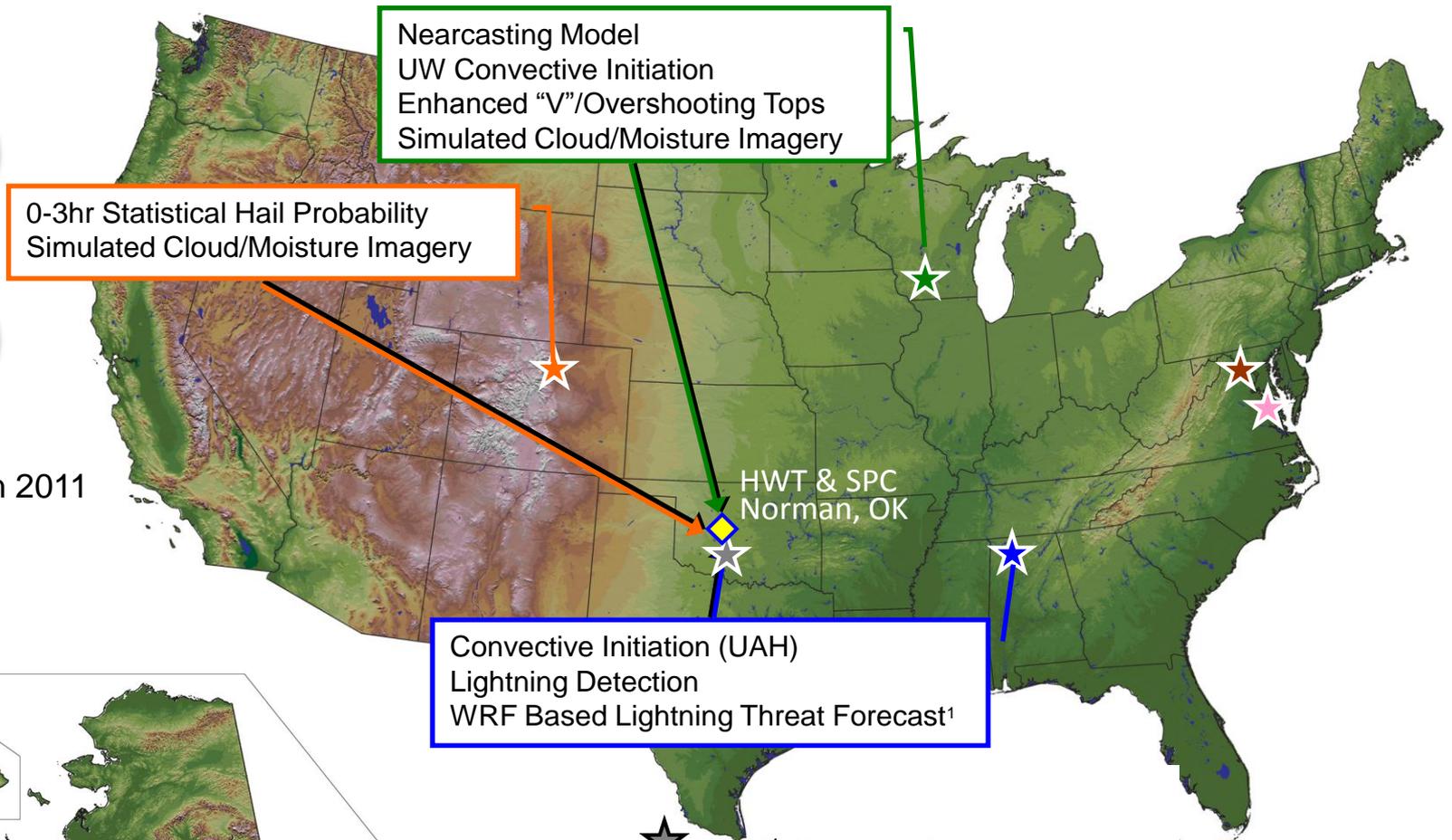


Hazardous Weather Testbed and Storm Prediction Center (Spring)

Focus
Convection

- Experimental Warning Program
- HWT Spring Experiment
- Experimental Forecast Program

Duration
17 May – 18 Jun 2011



- ★ CIMMS/NSSL-Norman, OK
- ★ CIMSS-Madison, WI
- ★ NASA SPoRT and UAH-Huntsville, AL
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¹Input data from NSSL



HWT/SPC Spring Experiment EWP/EFP Operations



Forecaster Feedback:

- Real-time blogging <http://goesrhwt.blogspot.com/>
 - During forecast/warning exercises
 - Participants are also encouraged to blog following forecast/warning exercises
- Web-based surveys
 - Immediately following forecast/warning operations
- Daily post-mortem discussions
 - Between visiting scientists and forecasters

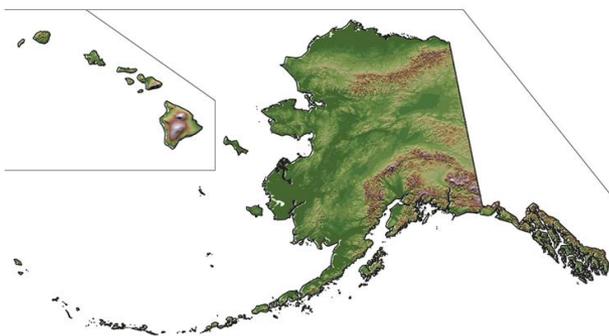
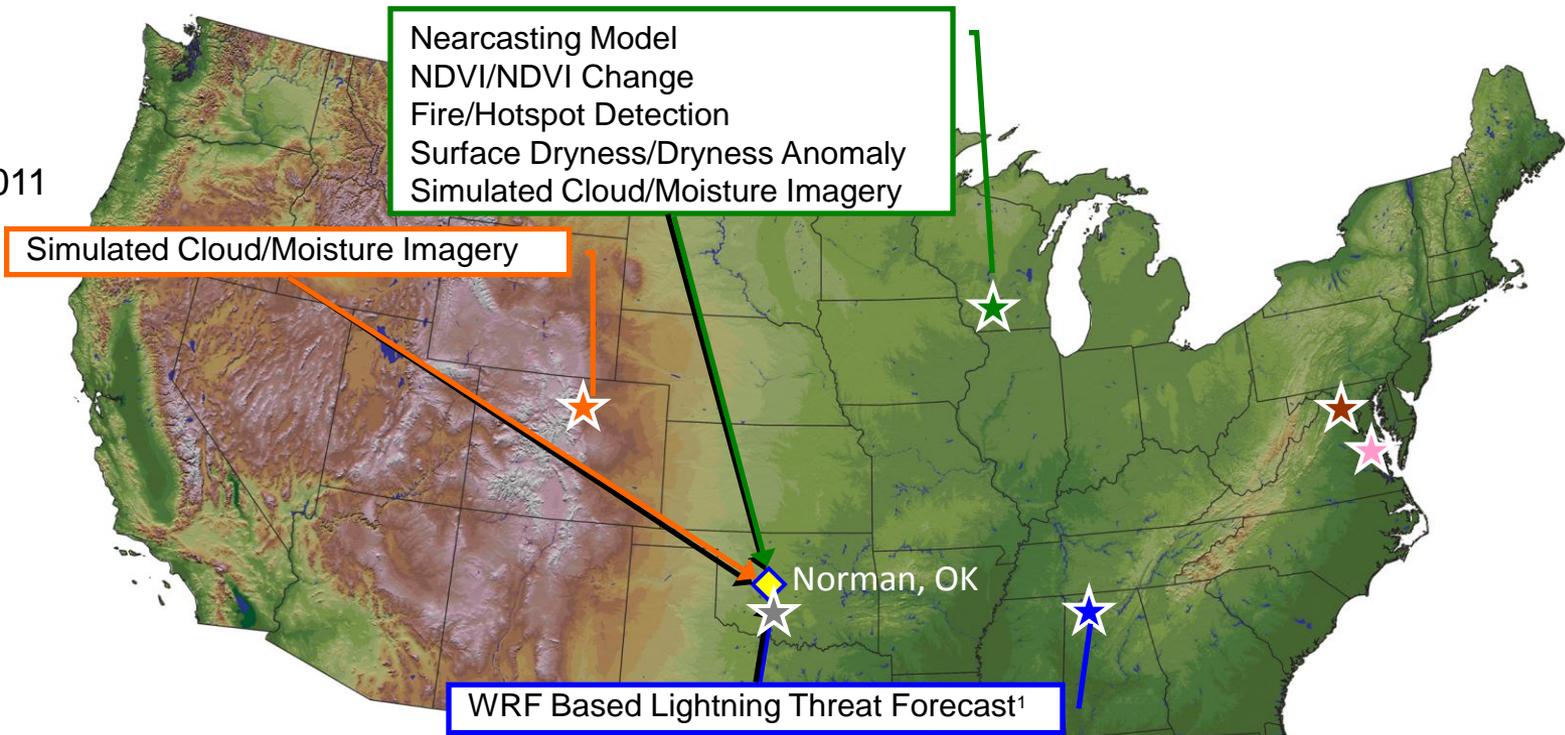
Satellite Champion interaction/involvement extremely important!



Hazardous Weather Testbed and Storm Prediction Center (Summer)

Focus
Fire Weather

Duration
22 Aug – 2 Sep 2011



- ★ CIMMS/NSSL-Norman, OK
- ★ CIMSS-Madison, WI
- ★ NASA SPORT and UAH-Huntsville, AL
- ★ CIRA-Ft. Collins, CO
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¹Input data from NSSL

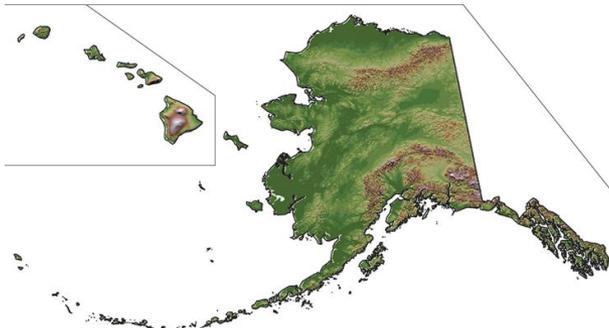
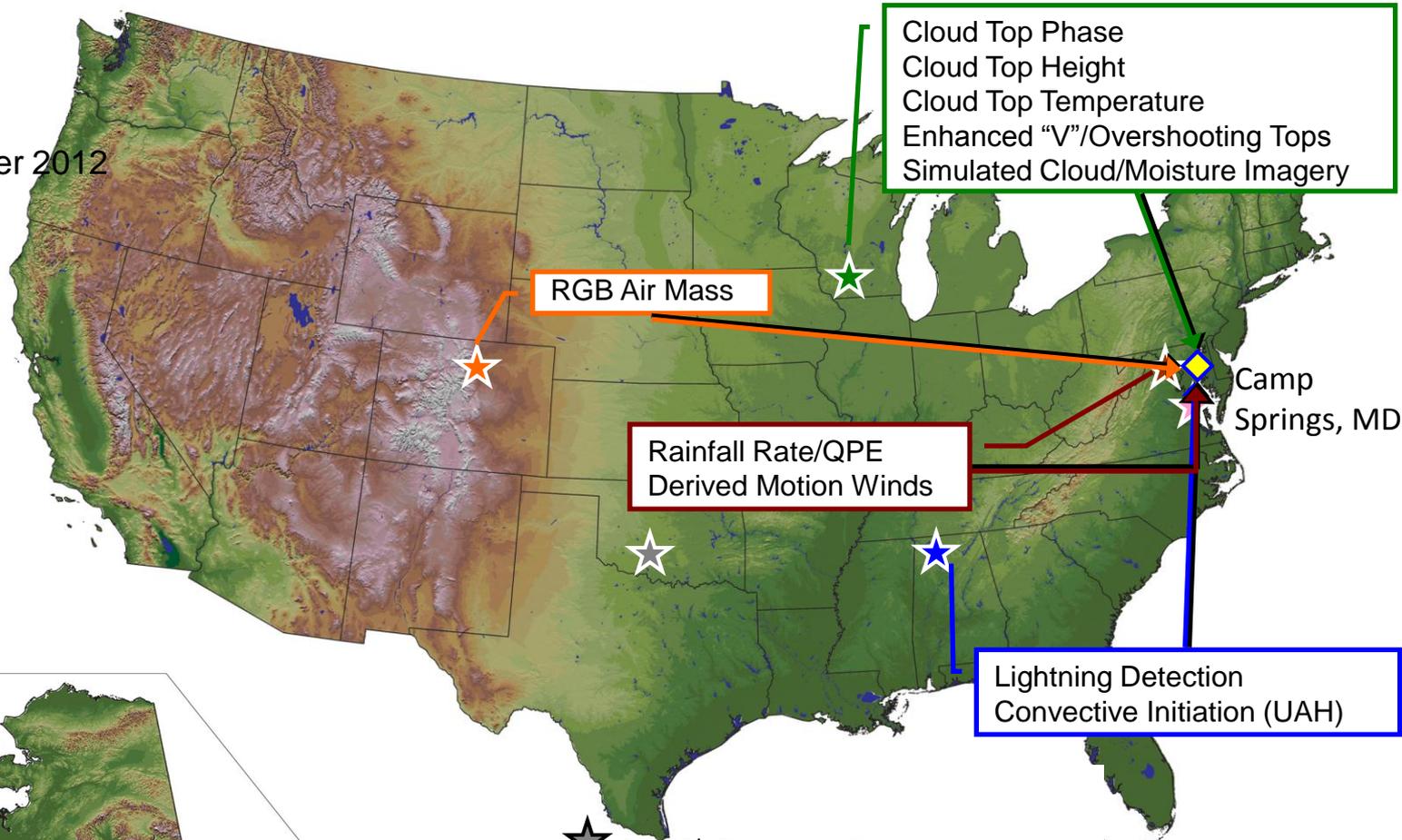


Hydrometeorological Prediction Center, Ocean Prediction Center, and NESDIS' Satellite Analysis Branch



Focus
Offshore T-Storms

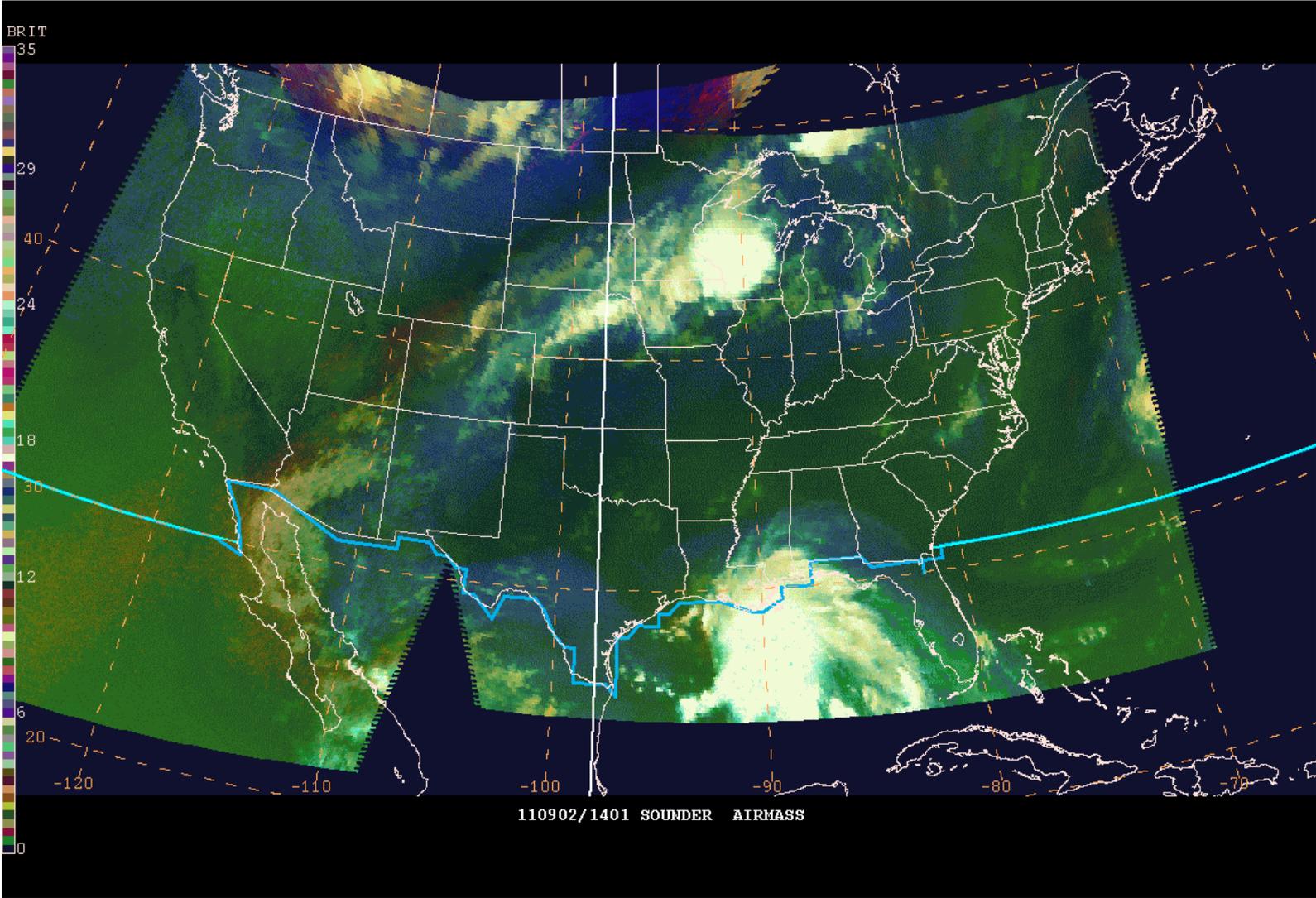
Duration
Summer 2011 – Winter 2012



- ★ CIMMS/NSSL-Norman, OK
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- ★ NASA SPORT and UAH-Huntsville, AL
- ★ CIRA-Ft. Collins, CO
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- ◆ PG Demonstration Locations



Hydrometeorological Prediction Center, Ocean Prediction Center, and NESDIS' Satellite Analysis Branch

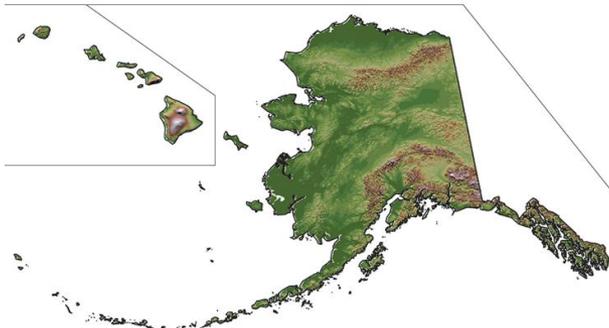
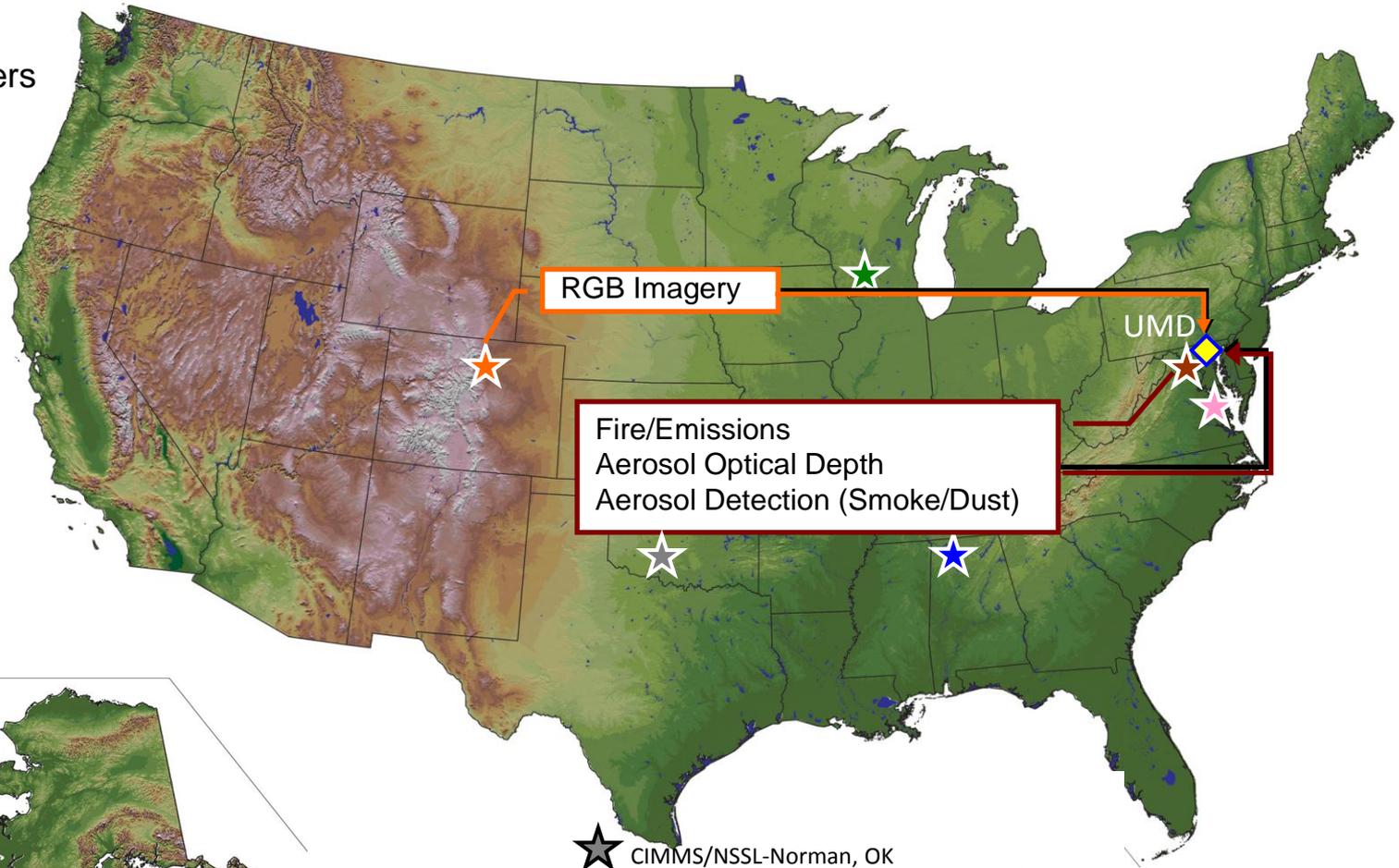




Air Quality

Focus
Air Quality
State/Local Forecasters

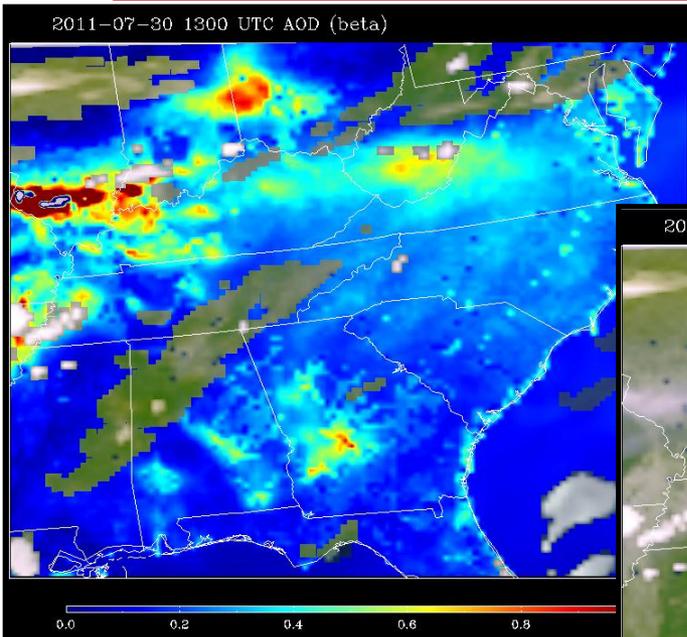
Duration
11 Jul – 24 Jul 2011



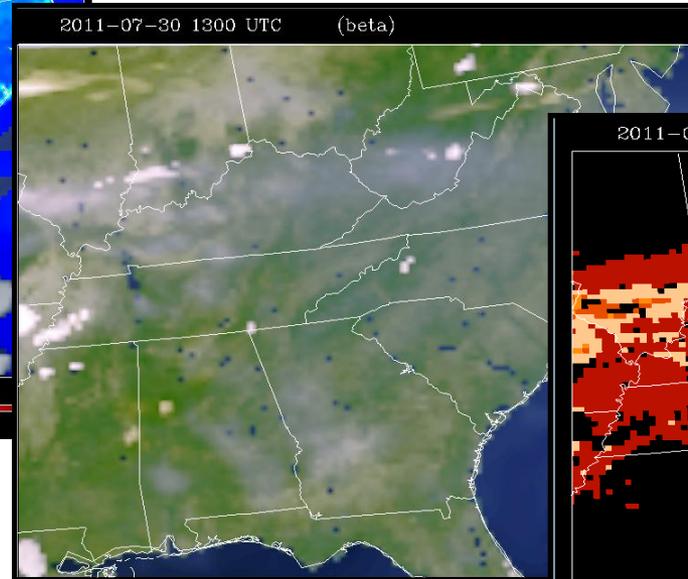
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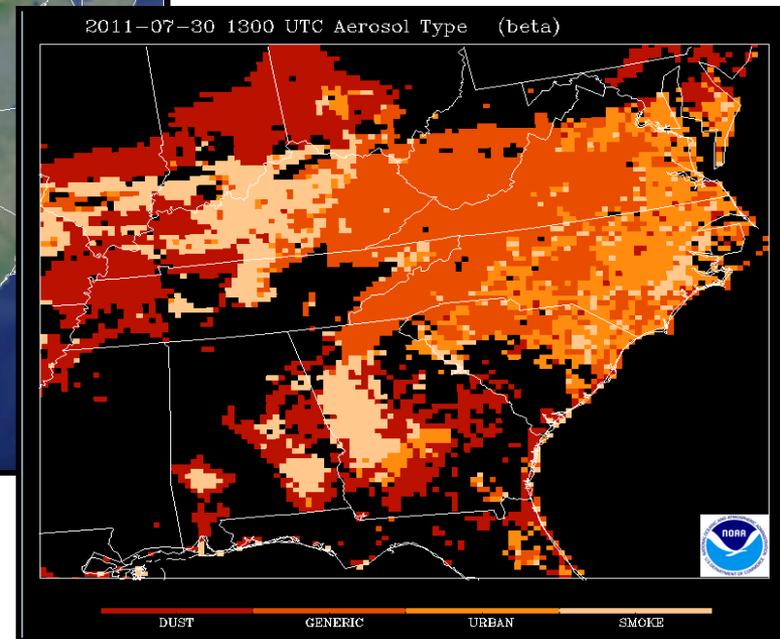
Air Quality



Example of ABI proxy AOD product for July 30, 2011, 1300 UTC.



Example of ABI proxy RGB product for July 30, 2011, 1300 UTC.



Example of ABI proxy aerosol type product for July 30, 2011, 1300 UTC.

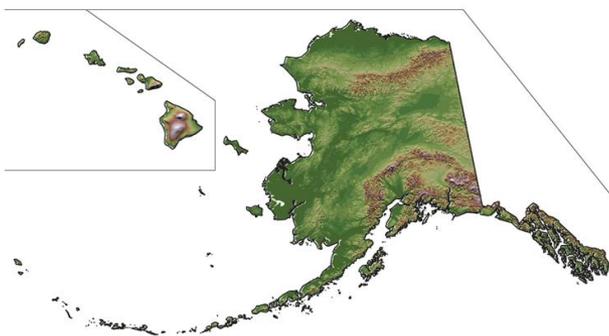
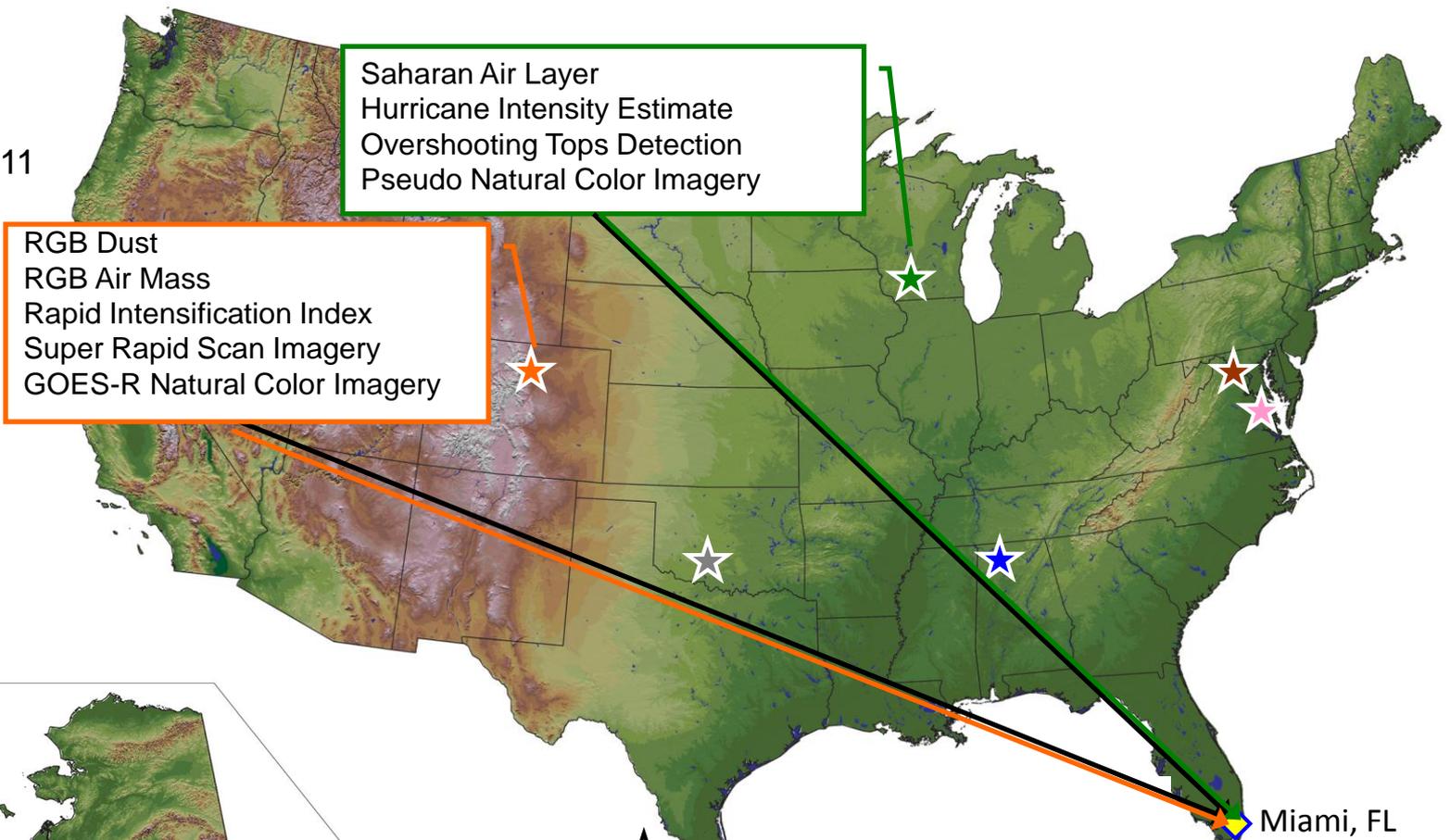
IDEA - Infusing Satellite Data Into Environmental Applications:
<http://www.star.nesdis.noaa.gov/smcd/spb/aq/aqpg/index.php>



National Hurricane Center

Focus
Tropical Weather

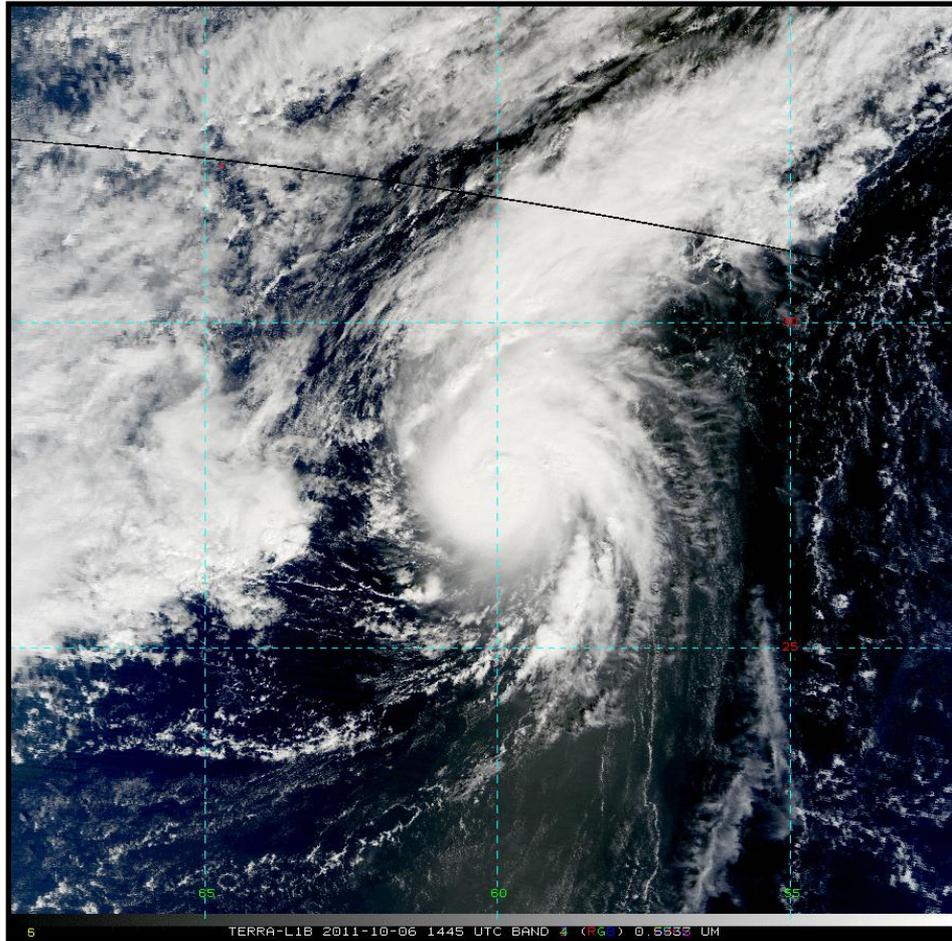
Duration
1 Aug – 30 Nov 2011



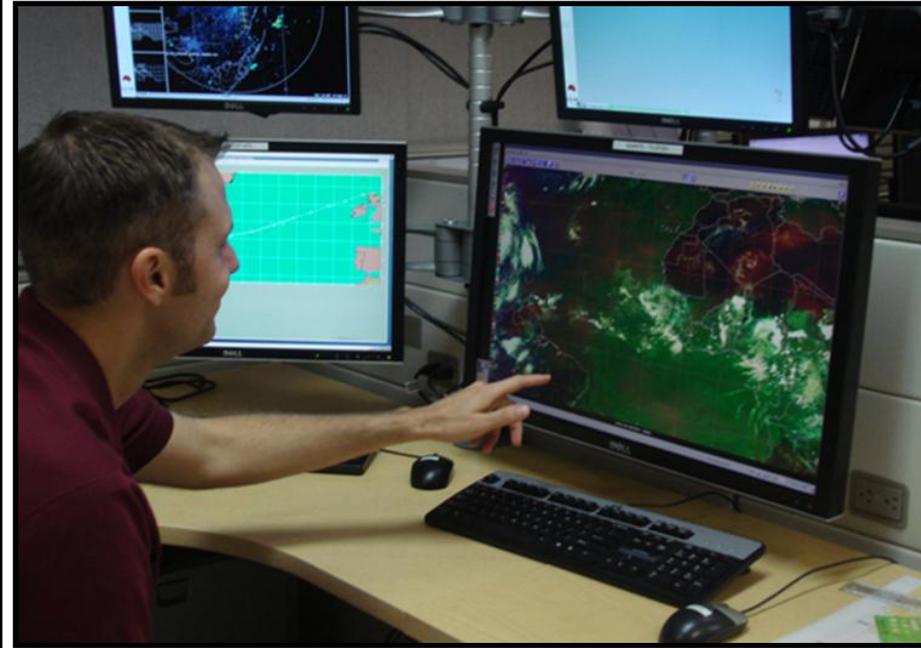
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National Hurricane Center



GOES-R Pseudo Natural Color Imagery of Hurricane Philippe (Green channel derived)

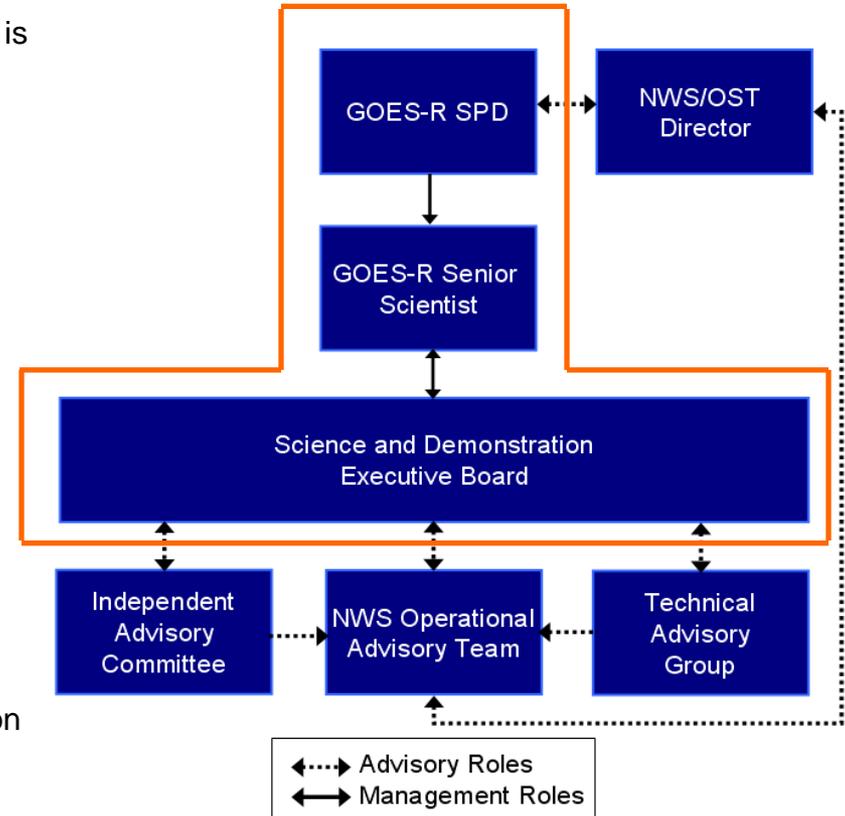


NHC Hurricane Specialist Evaluating the RGB Airmass Product



PG Direction 2012 and Beyond

- Governance Change
 - Science and Demonstration Executive Board (SDEB) is formed from:
 - Proving Ground Executive Board
 - GOES-R Risk Reduction (R3) Governing Board
 - Serves to better address operational requirements
 - Provides a mechanism for the NWS Corporate priorities to guide both Proving Ground and Risk Reduction activities
- Formation of 3 groups to support the SDEB:
 - NWS Operational Advisory Team (NOAT)
 - Ensures that the science development and demonstration activities are aligned with operational priorities.
 - Independent Advisory Committee (IAC) made up of non-NOAA senior-level technical experts
 - Performs technical appraisals of the projects developed under the Science and Demonstration activity (PG and R3 projects).
 - Technical Advisory Group (TAG), made up of subject matter experts from NOAA and NASA
 - Serves as an advisory group to the SDEB and the NOAT during the proposal review process.



Original Governance Structure



Summary

- 2011 PG Focus areas were Cloud/Snow Discrimination, Fire, Convection, Offshore Thunderstorms, Air Quality, Tropical Weather, Volcanic Ash, and Fog.
- Successful demonstrations were held at NCEP Centers, WFOs, and the Hazardous Weather Testbed throughout the year.
- Forecasters not only get a feel for GOES-R data and information but they are also given an opportunity to provide feedback about the usefulness of the data, performance characteristics, and display capabilities.
- Satellite Liaisons at demonstration locations interact with the forecasters as well as the developers continuing the research to operations to research loop.
- With new governance structure, 2012 demonstrations will be more aligned with NWS Operations.



Special Thanks

for contributing to this presentation



Mike Brennan
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