



GOES-R Mesoscale Product Development



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Overview

Numerical simulations and existing in situ and satellite data are used to better understand the capabilities of the GOES-R advanced instruments for mesoscale weather analysis and prediction. This science study will help to reduce the time needed to fully utilize GOES-R as soon as possible after launch.

Current Activities at CIRA

Mesoscale Weather Database

GOES, MSG, MODIS, AVHRR, AIRS, RADAR, RAMS Simulations, ETA Analyses, GPS Soundings, ARM Soundings, Rawinsondes.

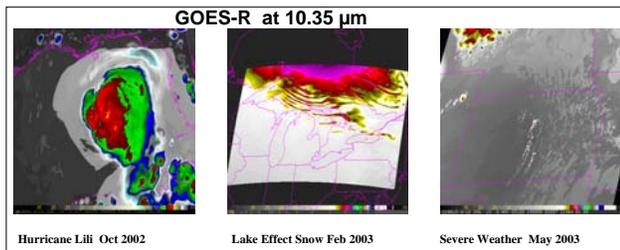
Synthetic GOES-R data generation and analysis

Synthetic Imagery of Mesoscale Study Cases

- Tropical Systems
- Lake Effect Snow
- Severe Weather

Fire Hot Spot Simulations embedded in

- Severe Weather in Kansas
- Central America
- Lightning Product Development

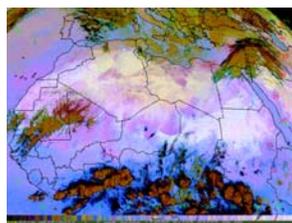


Prototype Hazard Products and Display

Prototype Hazard Products

- Daytime Fog
- Blowing Dust
- Volcanic Ash
- Smoke from Fire

Testing of new/experimental Products in real-time mode.

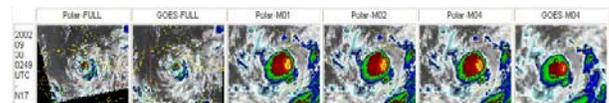


Three-color dust product showing dust outbreak across most of northern Africa. Dust is pinkish-red, thicker clouds are yellow-green, cloud-free areas are light blue

Information content analysis using MLEF data assimilation

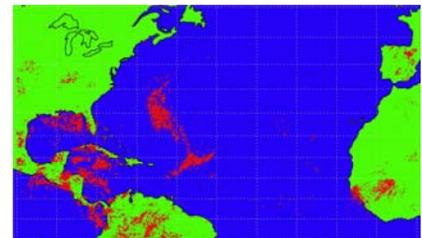
Develop techniques to determine the information content of GOES-R data using Maximum Likelihood Ensemble Kalman Filter (MLEF) data assimilation.

Tropical Cyclone Product Development



- ABI Proxy Dataset: MODIS, AVHRR, GOES, MSG.
- Analysis of AIRS Temperature and Moisture Retrieval.
- Investigation of Tropical Cyclone Intensity and Surface Wind Estimation Algorithms.
- Lightning Mapper Application

World Wide Lightning Locator Network Daily Strikes 10-20 Sept 2006

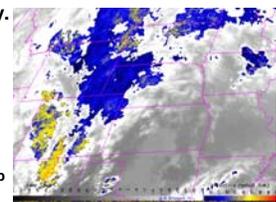


Severe Weather and Winter Weather Product Development

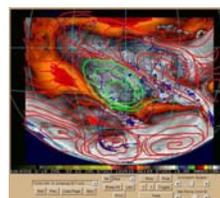
Development/Investigation of:

- Cloud Top Structure Climatology.
- Combination of Spectral Bands for Thunderstorm Features.
- Multi-channel Retrievals from Lake Effect Snow Bands for Snowfall Rates.

GOES Ice Cloud Effective Radius Product. Colors indicate cloud-top ice effective radius values.



National and International Training Activities



National and International GOES-R Outreach Training Programs

- VISIT
- SHyMet
- WMO

VISITview browser view showing water vapor imagery over South America with upper level features drawn on the imagery during the training session.

Future Plans

- Experimental product development using existing experimental and operational satellites.
- Data assimilation experiments will be conducted with real data.
- Increased emphasis on national and international training.
- Testing of experimental GOES-R mesoscale products.
- GOES-R fire hot spot proxy data sets.
- Lightning Product Development