Applications of Earth Remote Sensing in Response to Meteorological Disasters

Andrew L. Molthan, Jordan R. Bell, Lori A. Schultz, Jason E. Burks, Kevin M. McGrath, and Gary J. Jedlovec

NASA Short-term Prediction Research and Transition (SPoRT) Center, Huntsville, Alabama

https://ntrs.nasa.gov/search.jsp?R=20140006511

weather.msfc.nasa.gov/sport
NASA’s Short-term Prediction Research and Transition (SPoRT) Center supports the transition of unique NASA and NOAA research activities to the operational weather forecasting community.

Our primary partners are NOAA’s National Weather Service, their Weather Forecast Offices (WFOs), and National Centers. These organizations predict natural hazards and also assist in the disaster assessment process, benefitting from remotely sensed data.

In 2013, SPoRT continued to transition high resolution satellite imagery, derived products, and value-added analysis to WFO partners and NASA’s Applied Sciences Program.
NOAA Black Marble

Pre-event image

Post-Event May 21, 2013

Difference

May 21, 2013

VIIRS Day-Night Band Pre-Storm
2013-05-20 0741 UTC

VIIRS Day-Night Band Post-Storm
2013-05-21 0722 UTC

VIIRS Day-Night Band (% of Pre-Storm)
2013-05-21 0722 UTC

Moore “After” Neighborhood Image dims: 1368 px horiz, 2304 vert.

Damage Analysis: colored points plus simple outlines Image dims: 1368 px horiz, 2304 vert.
International Space Station / SERVIR Environmental Research and Visualization System (ISERV): June 27, 2013
Spatial Resolution: ~5 m
NOAA/NWS Damage Survey: EF-0
NOAA/NWS Damage Survey: EF-2
NOAA/NWS Damage Survey: EF-4
Maximum Intensity: EF-5
Yosemite Rim Fire in DNB and/or MODIS and VIIRS True Color

VIIRS Captures Overnight Fire Activity

The VIIRS day-night band (DNB) reflectance product provides a night-time image of reflected and emitted light, but with the resolution of day-time visible imagery. Analogous to how visible imagery uses reflected sunlight, the DNB uses reflected moonlight to see small-scale features at night that are not as readily seen in standard infrared satellite channels.
Super Typhoon Storm-Centric?

DNB Before

DNB After + Track

DNB Change

NOAA NGDC Black Marble Radiance

VIIRS DNB-IR Post-Storm: 2013-11-10

VIIRS DNB Percent of Normal: 2013-11-10