Enhanced Use of GOES for Estimating Land Surface Wetness With Application to Wildfire Forecasting at the NOAA Storm Prediction Center

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Motivations:
- **Provide additional guidance on relative dryness of vegetation from thermal inertia measured by GOES imager:**
- **Value added application for GOES data.**
- **Direct measurements of surface dryness are lacking.**
- **Microwave techniques designed for soil moisture have coarse resolution compared to GOES.**

Data:
- **Clear sky skin temperature.**
- **Surface insolation from NESDIS GOES Surface and Insolation Product (GSIP).**

Methodology:
- **Compute clear sky heating rate (10am-1pm daily).**
- **Normalize by insolation.**
- **Compute anomaly based on 5-yr monthly mean.**

Availability:
"N-AWIPS" National Center-AWIPS and
Web: *http://www.nssl.noaa.gov/~rabin/dryness*

Advantages:
- **Better resolution than microwave; Can be transitioned to GOES-R**
- **Can be combined with time change of Normalized Difference Vegetation Index (NDVI) for input to fire weather outlooks.**

Disadvantages:
- **Only available in cloud free regions.**
- **Sub-canopy characteristics are obscured but can be critical to fire fuels.**
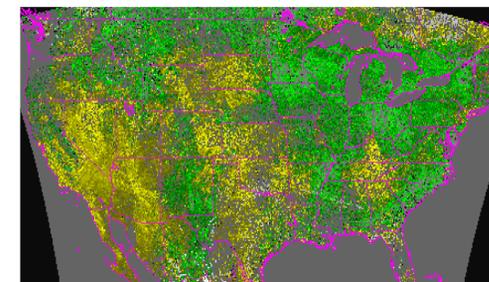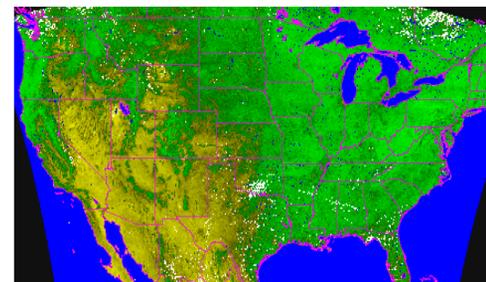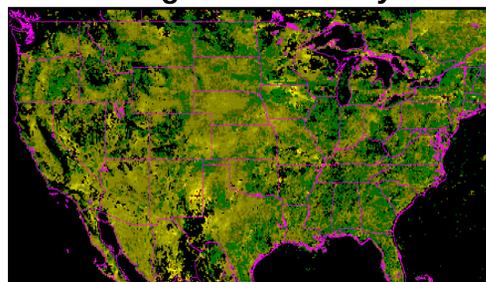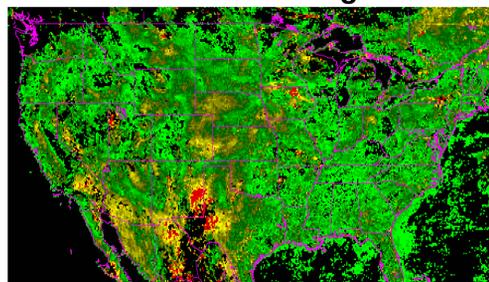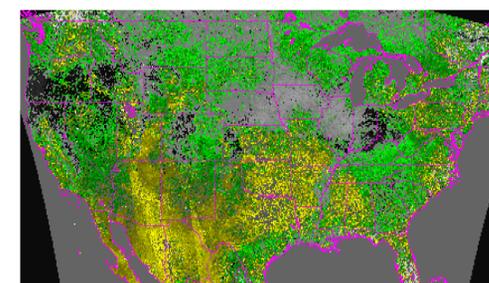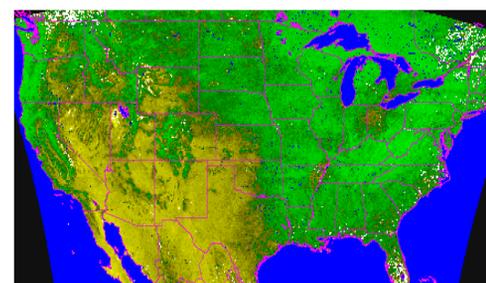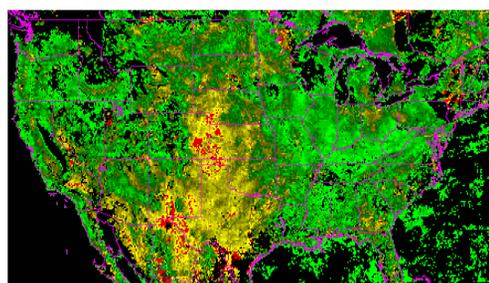
Observations:
- **Heating rates are inversely correlated with NDVI**
- **Extensive coverage of drought in southern Plains captured in 2011**
- **Near normal to wet conditions in Northwest U.S. In 2010-2011**
- **Single day images have limited coverage due to cloud cover**
- **GOES-11 data suggest drier conditions in western U.S. than GOES-13 data: calibration issue?**
- **Initial testing in Hazardous Weather Testbed, fire weather experiment: August 2011**
- **Validation with microwave satellite and ground-based data needed**