Overview

• The Joint Polar Satellite System (JPSS) Program, in partnership with NASA, will launch the NPOESS Preparatory Project (NPP) in October 2011. Data from the NPP Visible/Infrared Imager/Radiometer Suite (VIIRS) will be used to produce 14



- Environmental Data Records (EDR) of Land and Cryosphere variables, such as albedo, land surface temperature and snow cover extent.
- A team of community validation experts is tasked with characterizing and validating the VIIRS Land products. The team will compare VIIRS products with both heritage satellite products (e.g., MODIS) and field data (e.g., AERONET, FLUXNET, SurfRad, CRN networks, and aircraft data). In the prelaunch era, the Team is working closely with NASA's Land PEATE to assess simulated VIIRS products derived from MODIS data.
- Besides ensuring the operational utility and quantitative performance of the products, the team is testing and improving the CEOS validation protocols as defined through the Working Group for Calibration and Validation. This provides a medium for broad community interaction and cost savings achievable through coordinated sharing of tools, data and other resources.



NPOESS Preparatory Project Validation Program for Land Data Products from the Visible Infrared Imager Radiometer Suite (VIIRS)

Jeff Privette (NOAA/NESDIS National Climatic Data Center) and the VIIRS Land and Cryosphere Validation Team

Plans and Status



Temporal variability in geostatistical measures of spatial representativeness at the FLUXNET site in Howland, Maine,

Surface Albedo

- Post-Launch Approach: Evaluate against MODIS standard products; "Operationally" evaluate globally at BSRN and SurfRAD field sites
- Status: Statistically evaluated spatial representativeness of 56 field sites with Landsat data for different seasons
- Lead: Crystal Schaaf (schaaf@bu.edu)



Maps identifying 30 km cells with snow (white), cells without snow cover (green) and cells completely covered by cloudiness (gray) for the day February 2, 2003 from the focus period.

Snow Cover and Depth

- Goal: Evaluate against MODIS standard product; "Operationally" evaluate product using Interactive Snow Maps reported through NOAA's IMS program.
- Status: Testing with MODIS-derived VIIRS proxy data sets (5 km) and comparing against MODIS standard product indicates VIIRS cloud mask issues
- Lead: Peter Romanov (peter.romanov@noaa.gov)



Vegetation Index (VI)

- **Post-Launch Approach:** Use of in-situ generated atmosphere corrected reflectances for uncertainty analyses of Normalized Difference Vegetation Index (NDVI) and Enhanced Vegetation Index (EVI)
- Status: Validation sites represent a range of land cover types under various atmospheric, climatic, and geographic conditions. Uncertainty analysis are made for both bidirectional and nadir-view observations
- Lead: Alfredo Huete (ahuete@mac.com)



Land Surface Temperature (LST)

- Post-Launch Approach: Evaluate against MODIS standard product;
- "Operationally" evaluate over NOAA SurfRad, CRN and international field sites • Status: Developing statistical and model up-scaling techniques; Evaluating
- site heterogeneity; Several issues identified in VIIRS baseline algorithm
- Leads: Bob Yu (yunyue.yu@noaa.gov), Pierre Guillevic (pierre.guillevic@noaa.gov)



Left image shows Ice thickness from AVHRR on February 21, 2004; Right image shows Ice age from passive microwave data

Ice Surface Temperature/Sea Ice Characterization

- Post-Launch Approach: Evaluate against internally-developed MODIS and passive-microwave products
- Status: Products have generated and compared with buoy observations, AMSR-E imagery, upward-looking submarine sonar (SCICEX), in situ measurements
- Leads: Jeff Key (Jeff.Key@noaa.gov) and Jim Maslanik (James.Maslanik@colorado.edu)

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pTemperate Evergreen Fores pContinental Forest

Map of global validation site sample. Points identify site locations; colors indicate different strata reflecting a combination of climate and population.

Surface Type

- Post-Launch Approach: Accuracy assessment of global classification via high resolution imagery and probability design-based sample of validation sites
- Status: Sample design has been completed; first set of high resolution imagery has been acquired and is being processed
- Lead: Mark Friedl (friedl@bu.edu)

Surface Reflectance (IP)

- Post-Launch Approach: Evaluate against MODIS standard product and over AERONET sunphotometer sites using sophisticated radiative transfer model and automated comparison tool (ASRVN)
- Status: Adapted MODIS-based ASRVN validation tool to work with VIIRS and allow stratification of results by zenith angle, aerosol loading, surface brightness; Testing ASRVN against ground measurements
- Lead: Alexei Lyapustin (Alexei.Lyapustin@nasa.gov)

Poomacha Fire, CA, 27 October 2008, viewed at 10.5-um wavelength by the NASA AMS (U.S. Forest Service image). The FireMapper color scheme has been applied.

Active Fires (Application-Related Product)

- Post-Launch Approach: Evaluate against MODIS standard product and aerial imagery as available
- Status: Testing subpixel fire analysis with ASTER- and MODIS-derived VIIRS proxy data; Saturation issue with VIIRS 10.8 mm band (M15)
- Lead: Ivan Csiszar (Ivan.Csiszar@noaa.gov)