[EE] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-IS Intersection

[M-IS05]Satellite Land Physical Processes Monitoring at Medium and High Resolution

convener:Jean-Claude Roger(University of Maryland College Park), Shinichi Sobue(Japan Aerospace Exploration Agency), Eric Vermote
Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
We solicit papers on the land physical processes monitoring. In particular, it will include the inversion and use of reflectance products from Landsat(s) and Sentinel 2 sensors with other sensors. For the last years, medium and high resolutions became a useful and a powerful toll for Earth studies. Agriculture applications will be analyzed. An attention to the errors and uncertainties of the described products is suggested.
Topics of interest mainly include (not limited to):
- Use of products in agricultural monitoring applications (such as crop area, crop type, crop growing, yield estimation and prediction, damage assessment);
- Atmospheric corrections (including Cloud screening, Aerosol inversion, Radiative transfer...);
- Agriculture monitoring algorithm description;
- Data integration / Harmonized products from different sensors;
- Theoretical studies for sensors capabilities enhancements (e.g. addition of spectral bands) to future sensors for agriculture application;
- Development and use of new vegetation indices (i.e. red edge) and other products for agriculture applications;
- Evaluation or validation of potential products with ground measurements, official statistics;
- International initiative to enhance Earth-Observing-based agricultural information...
Depending on outcome, we think about a special issue.

[MIS05-P05]Harmonized Landsat/Sentinel-2 Reflectance Products for Land Monitoring

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Keywords:spatial medium resolution, landsat-8 and Sentinel-2, surface reflectance, harmonization

Many land applications require more frequent observations than can be obtained from a single “Landsat class” sensor. Agricultural monitoring, inland water quality assessment, stand-scale phenology, and numerous other applications all require near-daily imagery at better than 1ha resolution. Thus the land science community has begun expressing a desire for a "30-meter MODIS" global monitoring capability. One cost-effective way to achieve this goal is via merging data from multiple, international observatories into a single virtual constellation.

The Harmonized Landsat/Sentinel-2 (HLS) project has been working to generate a seamless surface reflectance product by combining observations from USGS/NASA Landsat-8 and ESA Sentinel-2. Harmonization in this context requires a series of radiometric and geometric transforms to create a single surface reflectance time series agnostic to sensor origin. Radiometric corrections include a common atmospheric correction using the Landsat-8 LaSRC/6S approach, a simple BRDF adjustment to constant solar and nadir view angle, and spectral bandpass adjustments to fit the Landsat-8 OLI

reference. Data are then resampled to a consistent 30m UTM grid, using the Sentinel-2 global tile system. Cloud and shadow masking are also implemented. Quality assurance (QA) involves comparison of the output 30m HLS products with near-simultaneous MODIS nadir-adjusted observations. Prototoype HLS products have been processed for ~7% of the global land area using the NASA Earth Exchange (NEX) compute environment at NASA Ames, and can be downloaded from the HLS web site (https://hls.gsfc.nasa.gov). A wall-to-wall North America data set is being prepared for 2018.

This talk will review the objectives and status of the HLS project, and illustrate applications of high-density optical time series data for agriculture and ecology. We also discuss lessons learned from HLS in the general context of implementing virtual constellations