Evaluation of High Resolution Data for LCLUC Science

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**Project Title:** Improving Burnt Area Mapping and Validation Efforts in Agricultural Landscapes of South/Southeast Asia Using Multi-Satellite and Very High-Resolution PLANET Data
Objectives

• Agricultural Emissions are highly underestimated in South/Southeast Asia.

• Evaluate very high resolution data for improving burnt area estimates in agricultural residue burning regions.

• Compare high resolution Burnt area estimates with MCD64A1 for the 2018-2019 burn season in agricultural landscapes. Perform accuracy assessment, calibration, and validation to improve burnt area estimates.

• Evaluate the potential of fire-induced spectral changes in the visible and NIR bands versus a combination of visible + red-edge + NIR bands (Planet versus RAPID EYE).
Data Requested and Status

• Region of interest:
  - Punjab, India; Ayeyarwady Region, Myanmar and Nakhon Louang, Laos

• Data downloaded status: ~30%
  - 4-Band Planetscope data (RGB, NIR)
  - 5-Band Rapid Eye (RGB, Red Edge, NIR)

• Timeline when you will be completing all data downloads?
  - Summer – March-May – Peak fire season; already downloaded;
  - Winter – October-December – yet to be downloaded

• Any issues: or challenges while downloading the data
  - None
Currently Using Surface Reflectance from Planetscope

The Surface Reflectance product is available in the Data API as the `analytic_sr` asset under the `PSScene4Band` item. It is provided as a 16 bit GeoTIFF image with reflectance values scaled by 10,000.
Planet Scope – Surface Reflectance Products

Scope for improvement

- Current Aerosol model:
  Continental Type (uniform across the world)
  Urban type preferred when close to N.Delhi

- Effects of Haze and thin cirrus clouds not corrected for

- Adjacency effects not corrected for
Planetscope - 2018-05-18 – Surface Reflectance (RGB) overlaid with VIIRS 375m Active Fires
Planetscope - 2018-05-18 – Surface Reflectance (RGB) overlaid with VIIRS 375m Active Fires
Next Steps

• Assess more scenes and do atmospheric corrections as necessary with change in type of aerosols and other parameters;

• Compare with VIIRS active fires in agricultural areas to infer burnt areas;

• Ground truth data collection for the current year (next month and during October) to arrive at spectral response curves; Use Landsat and Sentinel 1&2 data as necessary to interpret burnt areas.

• Assess commission and omission errors in burnt area products from MODIS as that of Planet data and arrive at correction factors for burnt areas.

• Approaches:

  • A). Visual interpretation and digitization of burnt area polygons in selected areas; b). Burnt area mapping using burnt area and vegetation indices (including Red Edge band) using random forests; classification accuracy assessment.

  • Re-calculate emissions from agricultural residue burning for the study areas