Questions & Answers Part 3

Please type your questions in the Question Box. We will try our best to get to all your questions. If we don't, feel free to email Jamon Van Den Hoek (vandenhj@oregonstate.edu), Hannah Friedrich (hfriedrich@email.arizona.edu), or Sean McCartney (sean.mccartney@nasa.gov).

Question 1: For the dataset, can we use the NICFI-Planet dataset with 3.5 m resolution?
Answer 1: Yes, the NICFI PlanetScope data (https://www.planet.com/nicfi/) are helpful for settlement-level land cover mapping but must be classified into a land cover map to offer comparable data to the various human settlement products that we discussed or further processed to make a functional refugee settlement boundary like we have shown. NICFI data only go back to 2015 and have coverage in the tropics, so don't have the same scope of coverage like Landsat or Sentinel-2, for example.

Question 2: What is the crop diversity of refugee camps in Colombia and Venezuela?
Answer 2: I'm not familiar with the diversity in crop types or extents of agricultural areas in refugee camps in Colombia or Venezuela. There may be some country or regional level crop classifications available that most likely are the most accurate crop type layers. There may also be reports that UNHCR, Food and Agricultural Organization (FAO) or World Food Programme (WFP) have put together on crop diversity at refugee settlements. Check out this page here and navigate to Colombia or Venezuela to see what information, report or maps are available: https://data.unhcr.org/en/countries/

Question 3: Sometimes, it is an option to work with mosaic data especially for areas with high cloud cover. How do we account for the detected "changes" that might be attributed to the different conditions of the pixels in the mosaic data (baseline or study period)?
Answer 3: We can use mosaic data to mask out cloud cover. You may have to create a shorter timestamp mosaic in order to account for inconsistencies. Tropical areas may also serve to be challenging due to the high amount of cloud cover. It may depend on the season for the mosaic.
The Landsat and Sentinel harmonized product could be a good resource to get your preferred temporal cadence.

https://www.earthdata.nasa.gov/esds/harmonized-landsat-sentinel-2

Question 4: Will repos and code be available? In terms of NPP time series analysis are you using the GPG 1.0 methodology to monitor SDG 15.3.1?
Answer 4: Yes! The links to the GEE code are provided in the presentation on the training webpage. You will need a GEE account in order to use Earth Engine. The type of methodology used for analysis is dependent on the data being incorporated into the analysis itself.

Question 5: Why did you decide to use K-means to determine boundaries and not a supervised classification algorithm?
Answer 5: Using an unsupervised classification means that we didn't have to train our data, which can be time consuming. We used the sample function in GEE to sample our data. As we could have used machine learning for classification as well (i.e. Random Forest), we used K-means for the sake of simplicity.

Question 6: Hi, this is a question related to the previous webinar. I wanted to ask whether you could point to any resource to use BFAST with R.
Answer 6: There are tutorials available showing how to use BFAST with R. Examples are included below:
https://bfast2.github.io/bfast-family-presentation.html#1
http://www.loicdutrieux.net/bfastSpatial/

Question 7: Is the QGIS trend.earth easier to use?
Answer 7: We did have a previous webinar covering Trends.Earth and will post information regarding that below.
https://appliedsciences.nasa.gov/join-mission/training/advanced-webinar-remote-sensing-monitoring-land-degradation-and-sustainable

Question 8: Is MODIS the right tool for Landcover classification in savannah landscapes? Can we make an error propagation to assess the validity of landcover change results?
Answer 8: It is dependent on what class scheme you want to implement in your classification and the duration and extent of your study. MODIS offers a long-term, daily record of land cover conditions, which can be exceptionally valuable if you're interested in studying savanna-wide changes due to precipitation changes, urbanization, desertification, etc. For actually making a land cover map at a given date

in time, most people would probably turn to Sentinel, Landsat, or a high-resolution product instead of MODIS.

Question 9: Between ESA worldcover and ESRI worldcover, which is the most precise for carrying out analyses?
Answer 9: ESA and ESRI world cover are global datasets that have similar coverage. We found for our applications that ESA was more precise, albeit slightly, than ESRI. In the humanitarian context, spatial detail is important, which ESA did a great job covering. There is also a newer dynamic world dataset that offers great detail on a global scale and we will include the link to it below.

Question 10: So is this as good a classification of built up we can get with free imagery, 10m (Sentinel) and 30m (Landsat)? Would the classification be dramatically better with higher resolution imagery, like 1m (SPOT) or 3m (PlanetScope)?
Answer 10: There are challenges using high resolution imagery. Sentinel and Landsat have greater spectral resolutions, which is better for land cover applications. Sentinel and Landsat are in development to serve as a reference to which higher resolution imagery can be cross referenced with. It is dependent on classification type and analysis.

Question 11: Have you worked with the MODIS land cover product? If so, what are your thoughts in terms of how it compares with the ESRI and ESA products?
Answer 11: We have, but MODIS is designed for broad scale urbanization with a lower spatial resolution. MODIS is not good at the settlement level as sensors with higher spatial resolutions are. We used MODIS for deforestation analysis purposes, where it thrived. In regards to comparing it with other products, it is again dependent on your research and application as data can vary regardless of resolution.

Question 12: Is it possible to reduce the size of the scenes which can be downloaded from ESA and ESRI?
Answer 12: The scenes can be clipped/compressed and can be written using code on a program such as Google Earth Engine. You can also clip the scenes using GIS software such as QGIS after the fact.

Question 13: Moderate resolution with pixel-based methods is very traditional, but are there more modern classification methods like object-based or neural networks that can be applied for these applications?

Answer 13: Convolutional neural networks have been successful in humanitarian applications in tandem with high resolution imagery. It is very much possible to use these methods, but is beyond the scope of this training series.

Question 14: Is it possible to upload certain metadata into Earth Engine and use those in an analysis? For example, if I were doing a province-wide, or nation-wide (Canada-wide) analysis, and I need to use region-specific selections of dates (e.g., different harvest or planting dates for different crops in different regions), could I upload that metadata to GEE from a local CSV file, or would I have to hardcode that in Javascript?

Answer 14: You can upload a feature into GEE as an asset. You can upload the assets individually as a single feature or as a feature collection. You can also hardcode the feature into the GEE code itself if preferred.