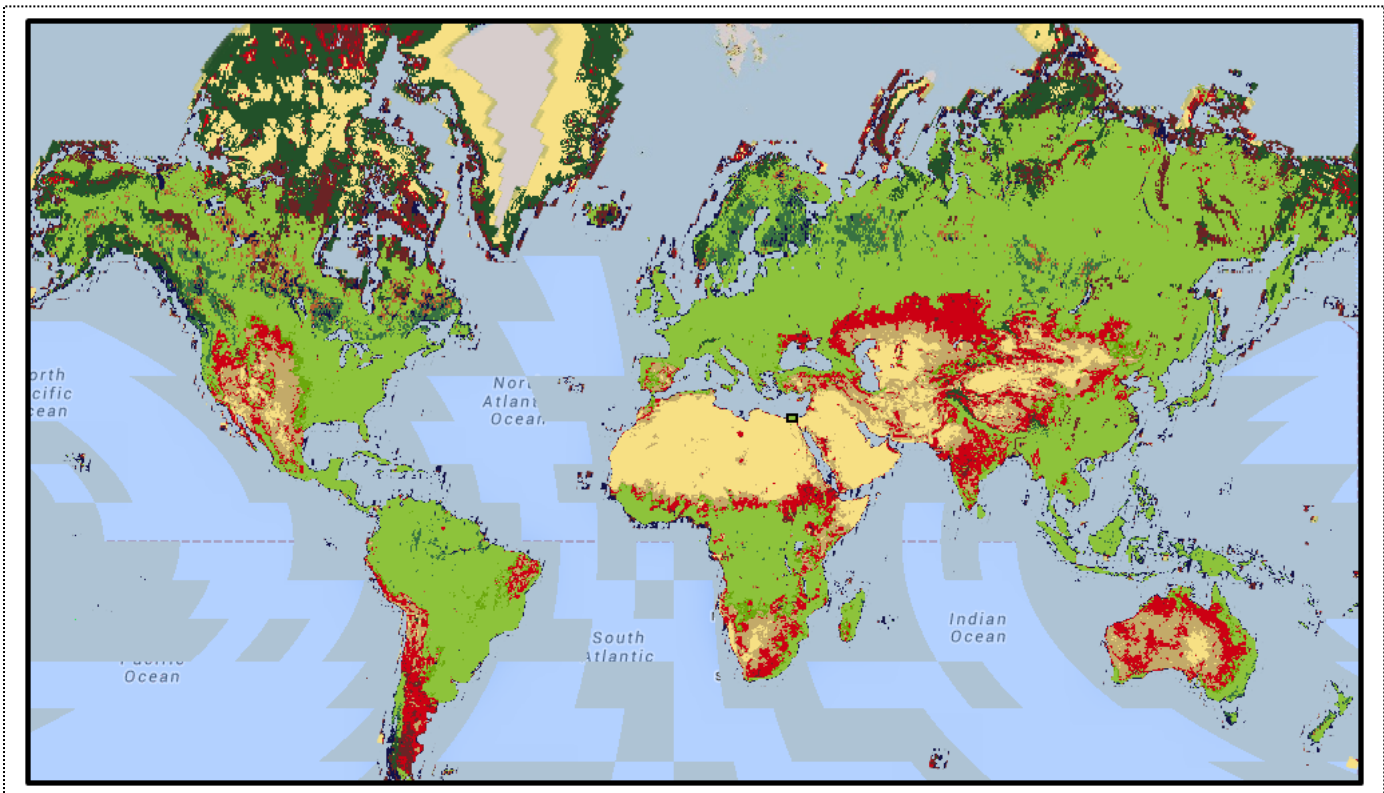


## Locally & Globally Applied Classification Algorithms for Urban Land Cover Detection using Earth Engine

Samapriya Roy, Indiana University, Bloomington (E-mail: roysam@indiana.edu)



**Fig 1. Global Land Cover Classification Map using MODIS MCD12Q**

### Overview

- Scaling up classification algorithms is complex
- Training using global datasets misses out on local scale resolution.
- One good way is to train using classified data & compare using different classification methods

**Background:** Classification techniques have improved with the increase in computational power, changes to existing algorithms and also the critical development of iterative routines that allow for repeatability and consistency in derived results. However sequential landscape with high temporal resolution has always been difficult owing to heterogeneity in scene type, acquisition conditions, sensors used and the robustness of the same classification techniques being extrapolate to all years in a sequence of datasets.

The current project consists of using Earth Engine (EE) coupled with training methodologies making use of long term data availability, machine learning and parallel

processing tools. Since the images are not acquired or process physically at the user end this reduces overall cost and run time. The project setup is initially set locally within the **Indianapolis Metropolitan Statistical Area** and expanded globally as proof of concept towards exploring relationship and scaling issues in classification methodologies.

**Preliminary Results:** Since a lot of the globally derived land cover datasets are developed over coarser scale to identify specific land cover types, they can be used as global training sets for classifiers. The current methodology is being utilized to generate sequential imagery across multiple cityscapes to urban growth assessment (including Indianapolis, US, Belem, Brazil, and Bangalore, India among others).

Using the Earth Engine platform allows us to pull large collections of datasets and perform at the fly calculation in a short period of time. Overall local and global land cover algorithms might need modifications to account for effects that are not visible at a global and/or coarser scale. The datasets are being analyzed before a consistent manuscript is developed for submission to a journal.