

# **REBECCA LEHMAN – UNIVERSITY OF COLORADO AT BOULDER**

## **STATEMENT OF PURPOSE:**

Bringing Big Data to Remote Places Remote sensing is a powerful tool. But the most vulnerable communities often do not have the necessary processing power or skilled analysts and can be limited by inaccessible terrain. Google Earth Engine overcomes these challenges and provides vulnerable communities with a novel platform to analyze and visualize NASA earth observations. In this presentation we use a case study of the U.S. Virgin Islands to highlight the immense possibilities of Google Earth Engine. The work is a partnership between the NASA DEVELOP program and the Department of Planning and Natural Resources Coastal Zone Management Division in the U.S. Virgin Islands. This Google Earth Engine tool allows managers and scientists to better understand land use trends, identify at-risk coastal habitats, and adds to research on the link between land use and coastal ecosystem health. Additionally, this research will impact future land use development and planning, specifically, how to mitigate the impacts of development on coral reefs.

## **DESCRIPTION OF DATA SETS:**

We used the Google Earth Engine API (GEE) to access and analyze Landsat 5 Thematic Mapper (TM), Landsat 8 Operational Land Imager (OLI), and Sentinel-2 Multispectral Instrument (MSI) imagery (Table A1). Landsat imagery has a spatial resolution of 30 meters (m), while Sentinel-2 has up to 10 m resolution. Landsat data were available as processed surface reflectance products in GEE. Sentinel-2 data were available as Level-1C top of atmosphere products. We acquired shoreline boundaries from the NOAA Continually Updated Shoreline Product and digitized areas that contained gaps in order to produce a boundary with which to clip imagery. We used aerial imagery produced by the U.S. Army Corps of Engineers in 1994 and 2010 with 1 foot resolution to assist in creating training points and visualization. To validate our results NOAA C-CAP land cover rasters and Environmental Protection Agency landcover maps were utilized (The Cadmus Group, 2011).