

Creating a Carbon Inventory using NEXTMap IFSAR and Terrestrial Laser Scanning: Project Update

Objective:

The goal of the project is to estimate change in dryland structure due to a fire gradient and to create a carbon inventory of a study site in Sonora, Texas using a combination of IFSAR and terrestrial laser scanning.

Background:

My father, a professor at University of Tennessee Knoxville, has several projects dealing with GIS and remote sensing and he will provide me with data through one of his projects. The project I have decided to work on benefits the UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD). The goal of this program is to build international carbon offset markets by cataloguing carbon inventories in developing countries.

The proposed project studies a method for creating a carbon inventory by combining terrestrial laser scanning (TLS) with 5m Interferometric Synthetic Aperture Radar (IFSAR). TLS is a high resolution remote sensing technology. IFSAR is a commercially available, high resolution (5m) satellite image dataset which has been purchased by UTK. For this project, TLS data was collected in Sonora, TX through field sampling.

Current Progress:

Literature Review:

1. *Landscape-scale extent, height, biomass, and carbon estimation of Mozambique's mangrove forests with Landsat ETM+ and Shuttle Radar Topography Mission elevation data* by Fatoyinbo et al.
2. *Mapping Height and Biomass of Mangrove Forests in Everglades National Park with SRTM Elevation Data* by Simard et al.,
3. *Determining leaf area index and leafy tree roughness using terrestrial laser scanning* by Antonarakis et al.

Next Steps:

1. I plan to research additional resources and then apply and potentially improve upon the methods described in the literature. As I understand it, these methods boil down to estimating parameters describing the vegetation included in the study area. These parameters come from geospatial IFSAR data which has been refined by the use of TLS.
2. I will include maps of current biomass
3. maps detailing the integration of TLS data
4. literature review
5. methodology
6. discussion of my findings.
7. Presentation

Map:

