PROJECT TITLE: Remote sensing of the mangrove ecosystem of the Niger Delta, Nigeria

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Project description

The delta of the Niger River is a significant ecosystem, that includes Africa’s largest wetland and a significant and extensive mangrove network that provides food, protection and other ecosystem services for nine coastal states; Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo and Rivers State. The Niger Delta extends over about 70,000km2 and makes up 7.5% of Nigeria’s land mass.

Mangrove ecosystems are wetlands consisting of woody vegetation that occur in intertidal marine and brackish environments (Gisesen et al., 2007). They are distributed along coasts in tropical and subtropical regions approximately 30°N and 30°S latitude (Giri et al., 2007). Mangroves are important due to the role they play in stabilizing coastline, reduce erosion, serve as habitat for a wide range of fauna and flora, bind and build soils via their roots, improve water quality and sequester CO2 within their wood and root system. emissions and other greenhouse gases; this is an important role for climate change mitigation. Land use change and a recent upsurge artisanal refining of petroleum products in the mangroves of the Niger Delta is causing significant damage and mangrove soil pollution. The proposed work would seek to measure the changes to the mangrove ecosystem of the Niger Delta Nigeria, to understand the potential drivers of these changes.

This research project would train the student in remote sensing skills required to measure changes in mangrove area and the potential drivers of this change across different epochs. We will utilize Sentinel imagery, in particular the Dynamic World Product in Goggle Earth Engine, to understand the major changes the relative areas of urban, forested and agricultural land at a high temporal frequency (ideally monthly). Based on the initial analysis we will identify key areas of rapid change to study in greater detail.

in the areas of rapid land cover change, we will map changes in land cover and infrastructural development (particularly linear oil infrastructure) using high resolution Worldview imagery. Here we will develop a classification system to map key drivers of mangrove change across a multi-decadal timescale. We will look to produce a land cover change map and quantify the drivers of land cover change and soil pollution in the study area.

This project will develop skills in remote sensing and coding. We are interested in students who are enthusiastic, open-minded and passionate about the environment and will support them in developing the skills necessary to quantify environmental change.
REFERENCE LIST

