COLLEGE OF SCIENCE
THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

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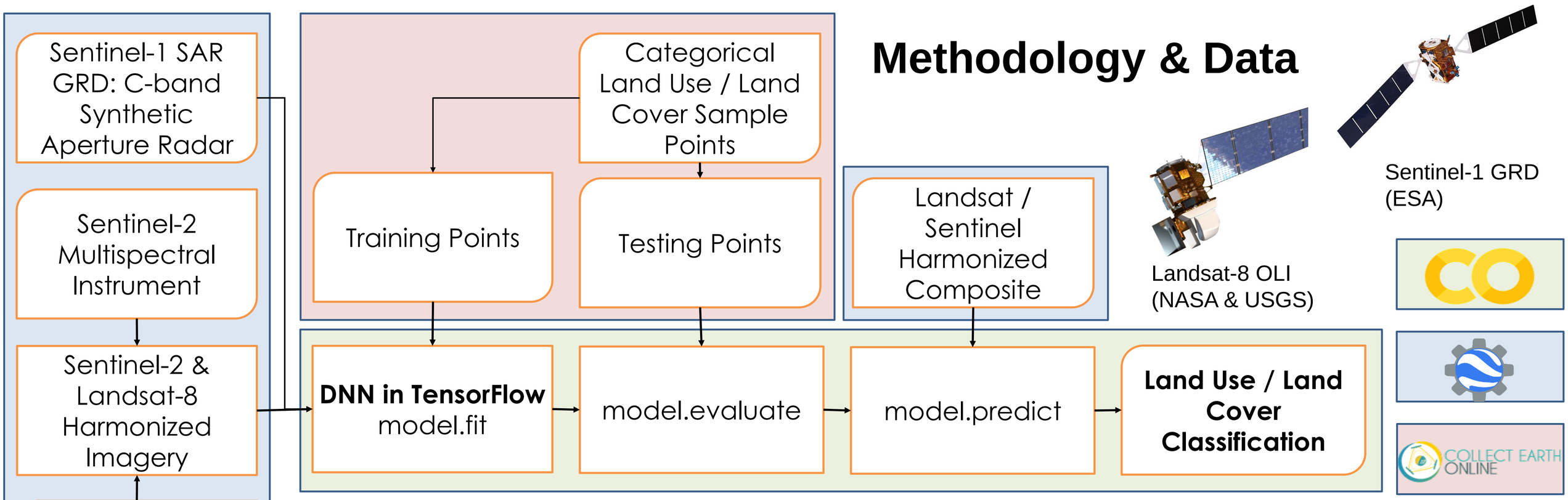
Research Horizons Day

Assessing Changes in African Mangrove Forests using SAR/Optical Data Fusion

Katherine Strattman, Emil Cherrington, Emily Adams, Robert Griffin, Rebekke Muench, Andi Thomas – Atmospheric & Earth Science Department

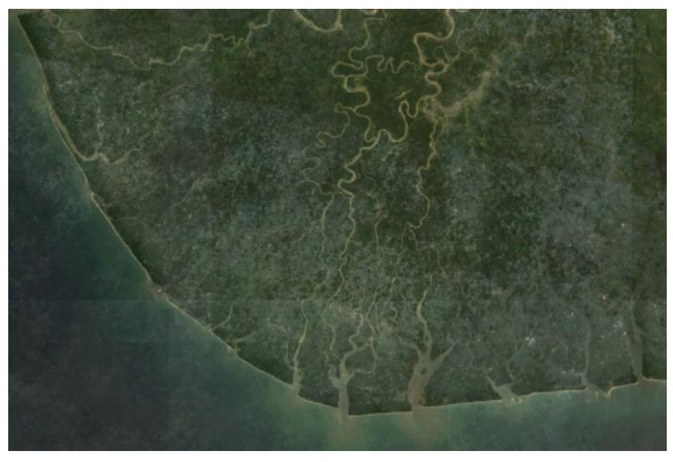
Overview: This study aims to assess change in mangrove forests in the Niger Delta from 2015 to 2018 using SAR and optical data fusion. Due to frequent cloud cover over the study area, SAR and optical data is used to obtain gap-free imagery without clouds. Landsat-8 OLI, Sentinel-, and Sentinel-2 imagery is fused, and the resulting imagery is classified using TensorFlow, an open source platform used in developing machine learning models. The resulting images are classified to discriminate mangrove forest cover from other land cover types, and change is estimated using image differencing.

Methodology & Data

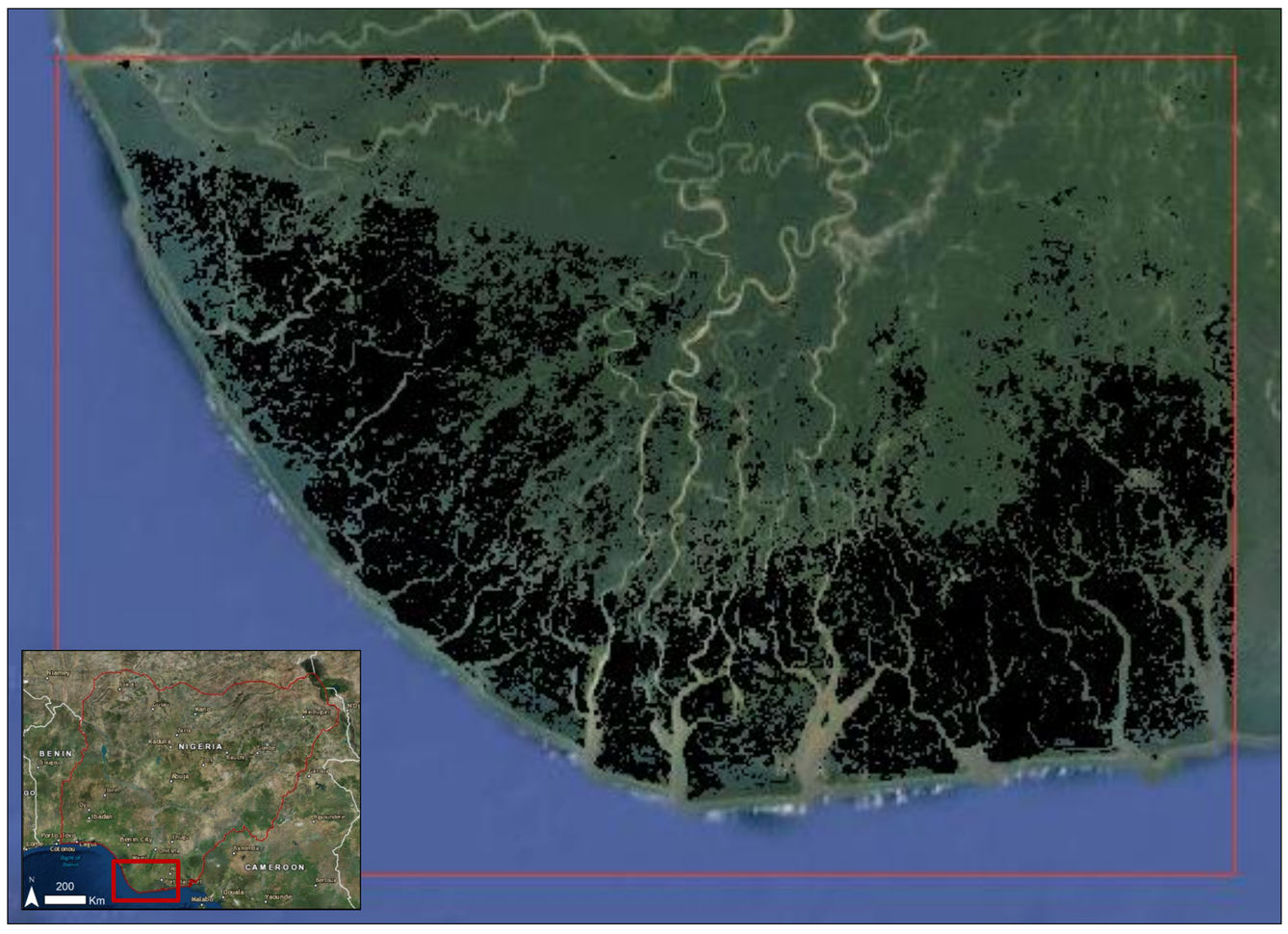


Results: The figure shows the results of the mangrove forest cover prediction from the DNN in TensorFlow, shown in black. SAR-only classifications cannot distinguish mangroves from non-mangrove forests, and optical imagery are plagued by cloud cover year around, but methods that utilize SAR and optical imagery benefit from complimentary information.

Landsat-8 OLI composite



Landsat-8 OLI and Sentinel-2 MSI harmonized product



Impact/Future Work: Understanding rates of magnitude of mangrove change across space and time can aid in identifying priority areas for forest regeneration, and can help construct sustainable management practices for the future. Further work will aim to conduct a change analysis using image differencing in order to understand where mangrove loss or gain is occurring.

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