Iona Ecological Conservation

Utilizing Earth Observations to Understand Landscape Patterns and Assist in Wildlife Management in Iona National Park, Angola

Synopsis

Following the end of the Angolan Civil War in 2002, the human and livestock population in Iona National Park drastically increased. Since 2017, an on-going drought has increased competition between wildlife, humans, and livestock for the park's scarce resources. In collaboration with African Parks, we used Earth observation data to aid in wildlife preservation efforts. We developed a land use/land cover (LULC) classification model using Google Earth Engine, to produce a high-resolution LULC time series analysis between 1990 and 2023. The results provided African Parks with quantitative data on landscape change over the past thirty years. They will use the findings to understand the park's history prior to their involvement and to track changes into the future. Remote sensing and machine learning are useful resources to improve conservation strategies in arid, data-scarce areas where ground-based surveys are challenging.

Objectives

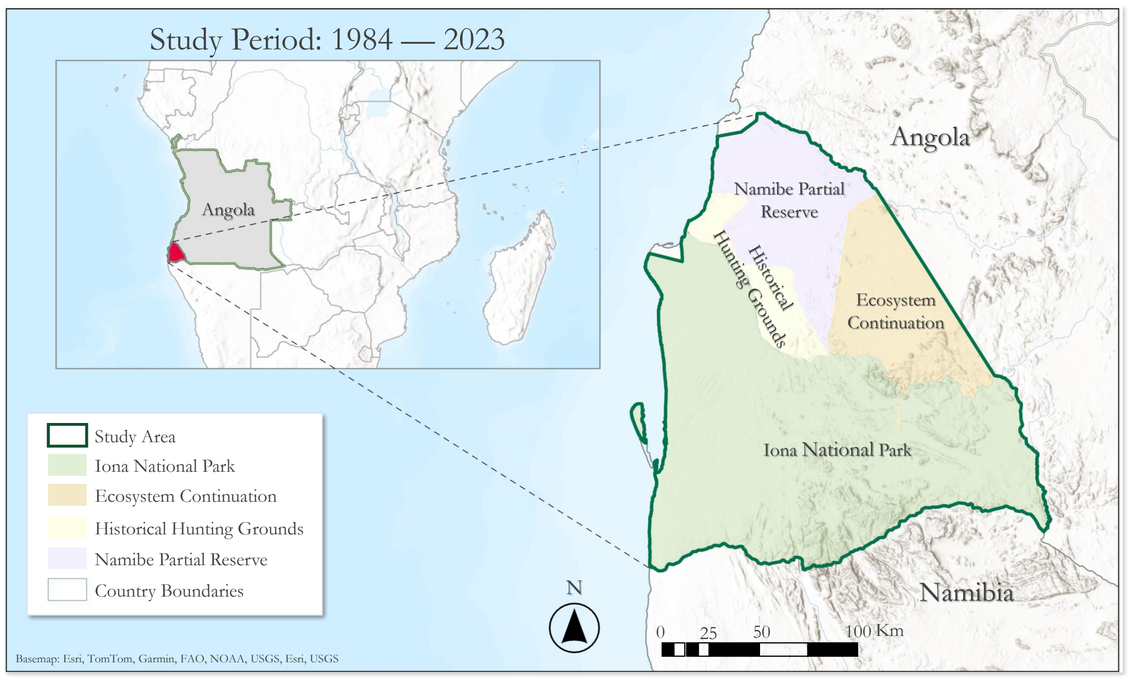
- **Create** a 2023 LULC map with vegetation details for Iona National Park
- **Generate** and analyze a time-series of LULC between 1990-2024 that analyzes change over time
- **Produce** a short video highlighting the importance of the project, methods, and results

Project Partner

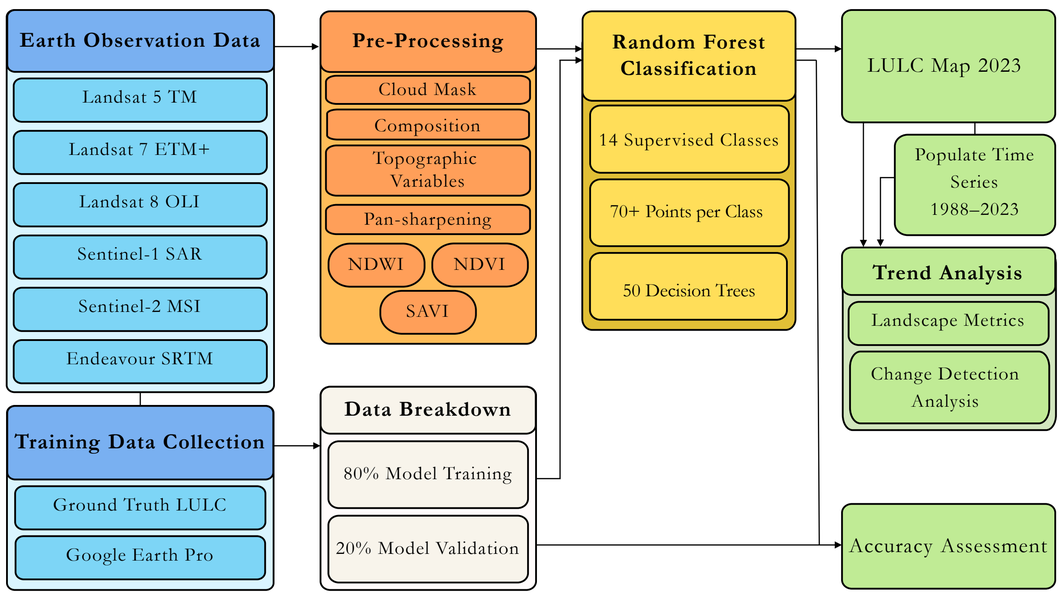
- African Parks

Study Area

Iona National Park, Namibe Preserve, & Associated Areas



Methodology



Team Members

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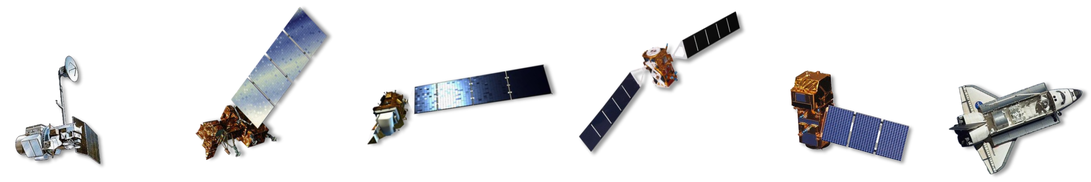
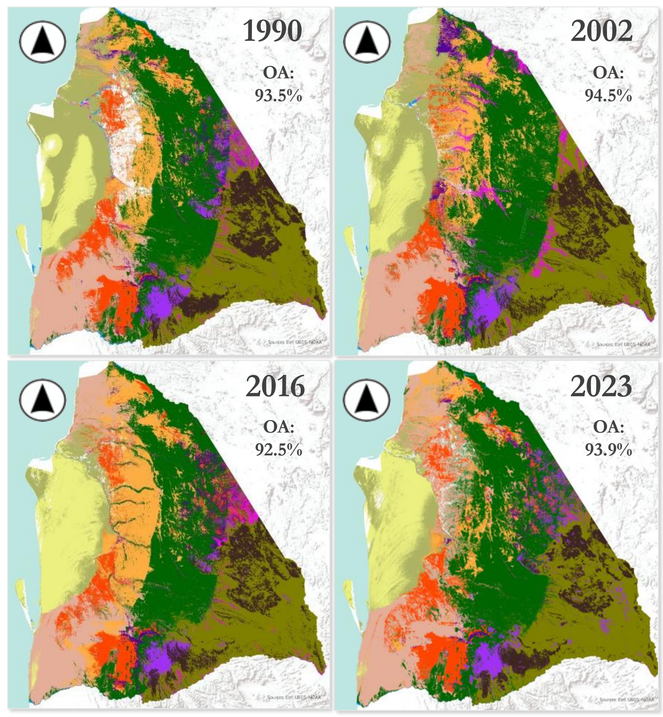
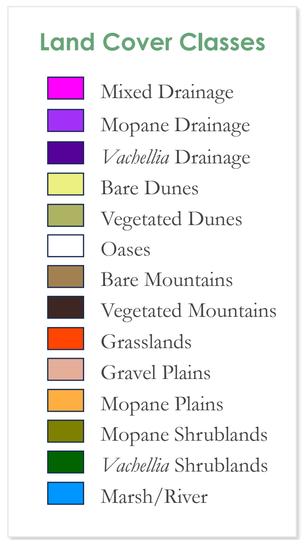
Earth Observations

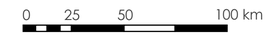


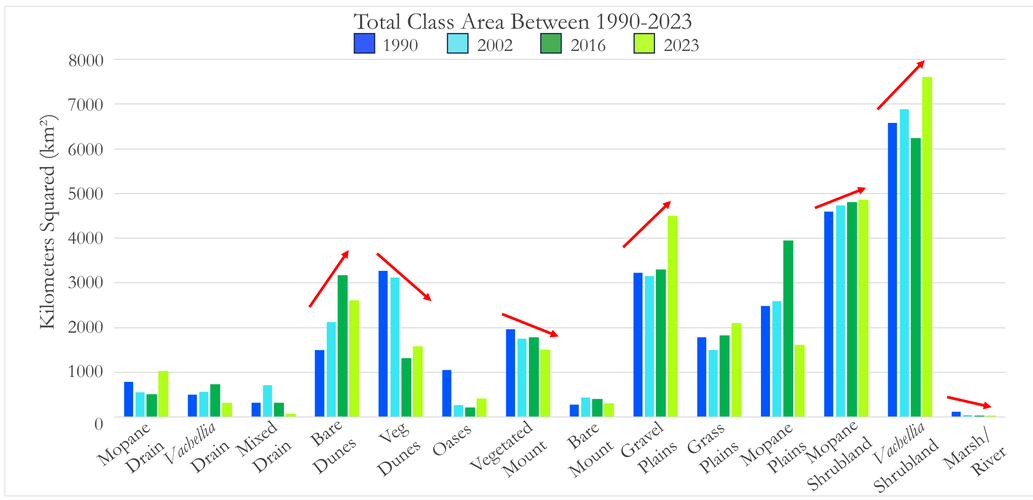
Landsat 5 TM | **Landsat** 7 ETM+ | **Landsat** 8 OLI | **Sentinel-1** C-SAR | **Sentinel-2** MSI | STRM

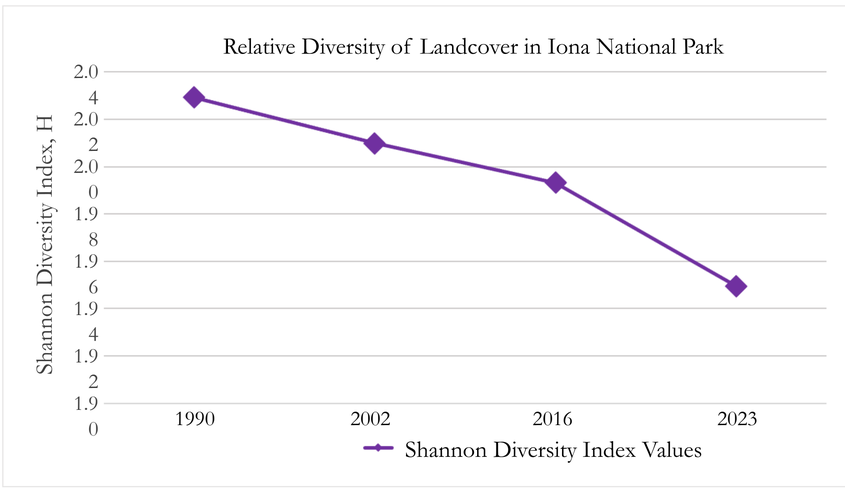
Results











Conclusions

- The random forest model was highly successful in detecting fine scale landcover types, doing so with over 90% overall accuracy across the time series.
- Overall diversity decreased across the study period, which indicates a potential threat to local flora and fauna.
- The land cover change analysis was difficult to interpret and would benefit from the inclusion of additional dates to the time series.

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