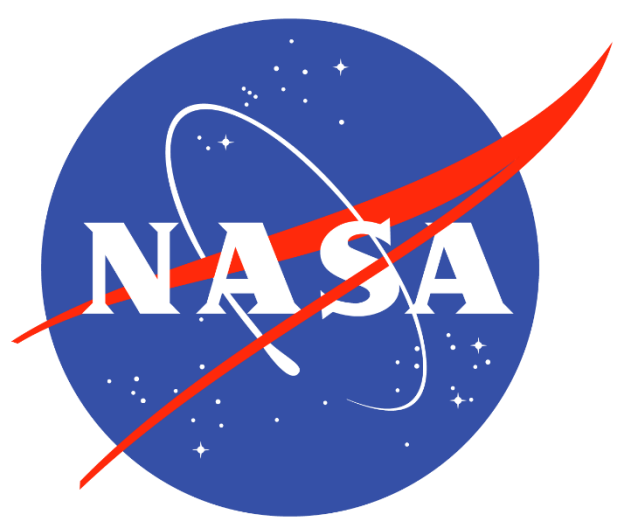




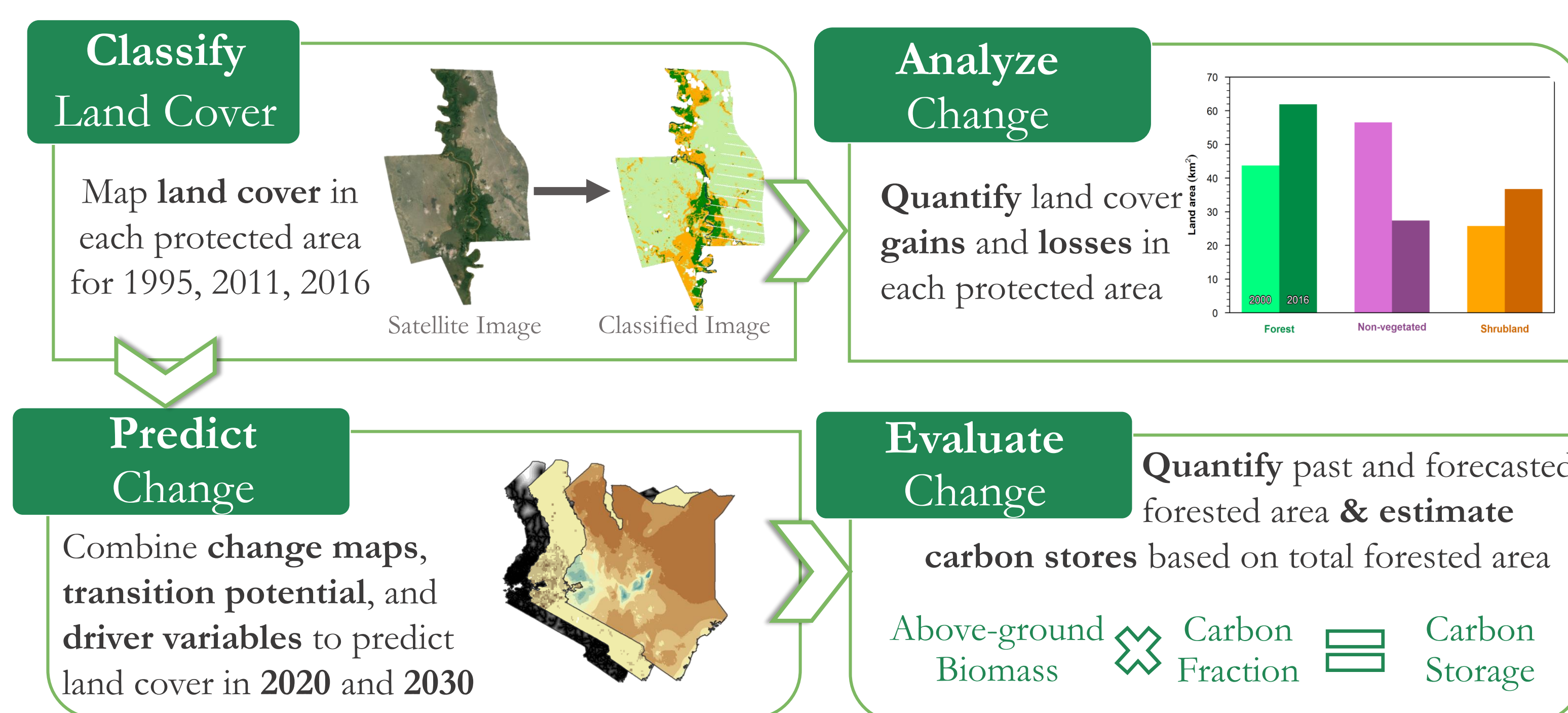
# Estimating Carbon Sequestration Within Global Environment Facility Funded Protected Areas in Kenya to Aid Future Policy



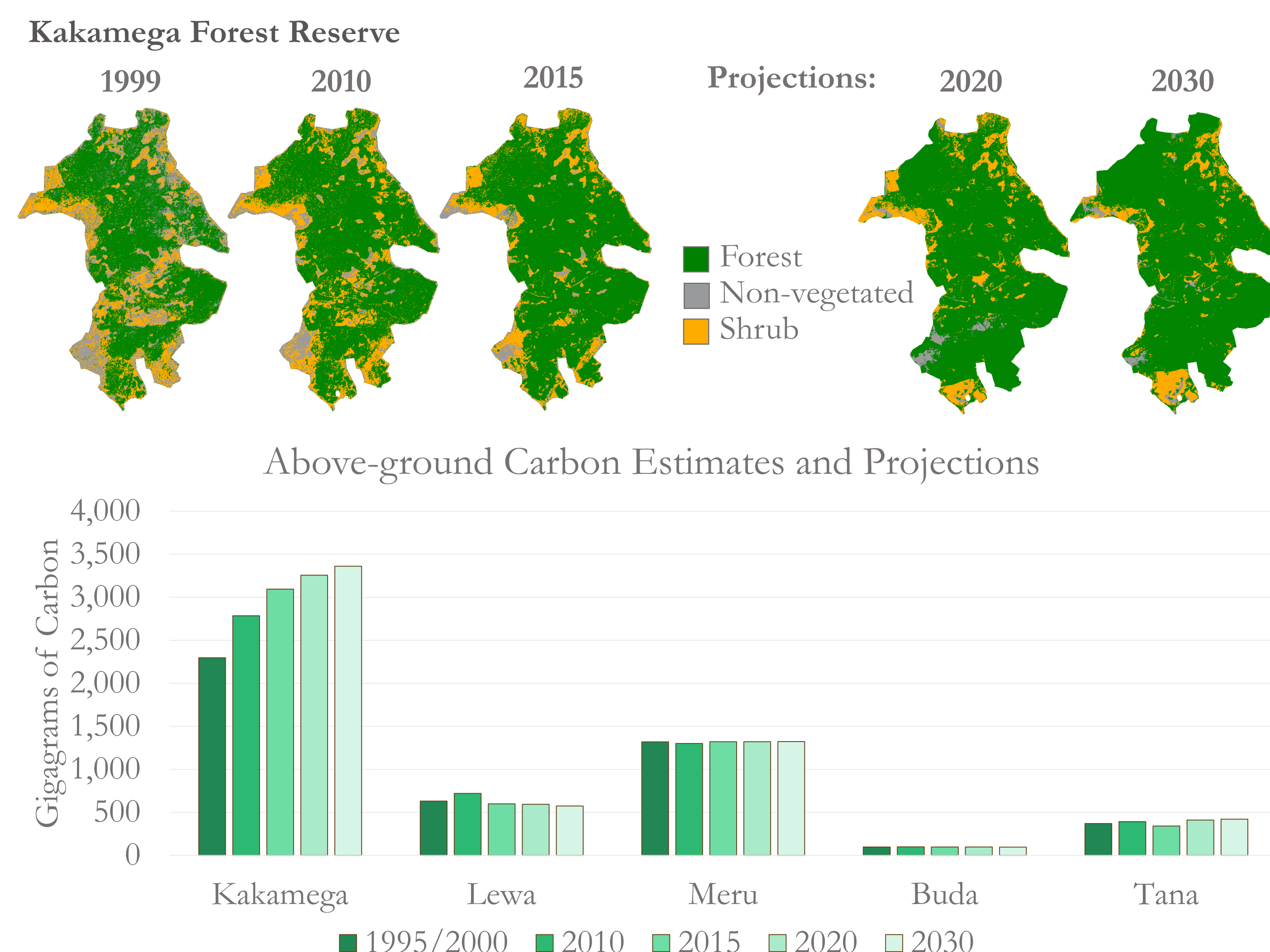
## Abstract

Global deforestation continues to pose a major environmental problem that threatens biodiversity and increases the number of species facing extinction. In Kenya and worldwide, agriculture is the main driver of forest conversion. Each year, Kenya loses 12,000 hectares (ha) of forest out of its total 4.34 million ha. In order to increase forest cover and protect biodiversity, the Global Environment Facility (GEF) funded projects to establish 12 PAs within Kenya from 1995-2008. Currently, GEF utilizes a global dataset to track only change in forest cover in the PAs. Creating maps of past and forecasted above-ground carbon estimates will enable GEF to gain a better understanding of how the PAs are both conserving biodiversity and addressing climate change mitigation through carbon sequestration. Using Landsat 5 TM, Landsat 7 ETM+, and Landsat 8 OLI imagery from 1995-2016, land cover in each PA was classified to map past changes in forest cover and above-ground carbon stock. Additionally, these maps were processed with ancillary datasets in TerrSet Land Change Modeler to forecast above-ground carbon stocks for 2020 and 2030, given current deforestation rates. Final maps of past and forecasted above-ground carbon estimates will aid GEF in future policy and program decisions.

## Methodology



## Results



## Team Members



Madeline Ruid  
Team Lead



Erin Glennie



Perry Oddo

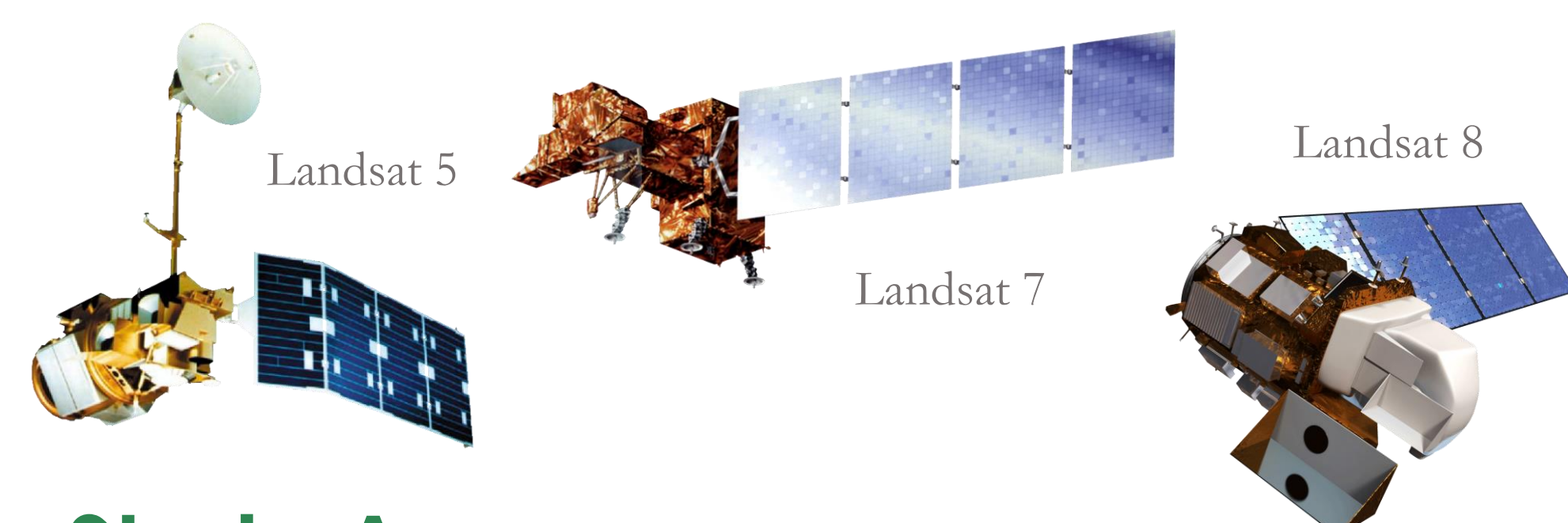


Alison Thieme

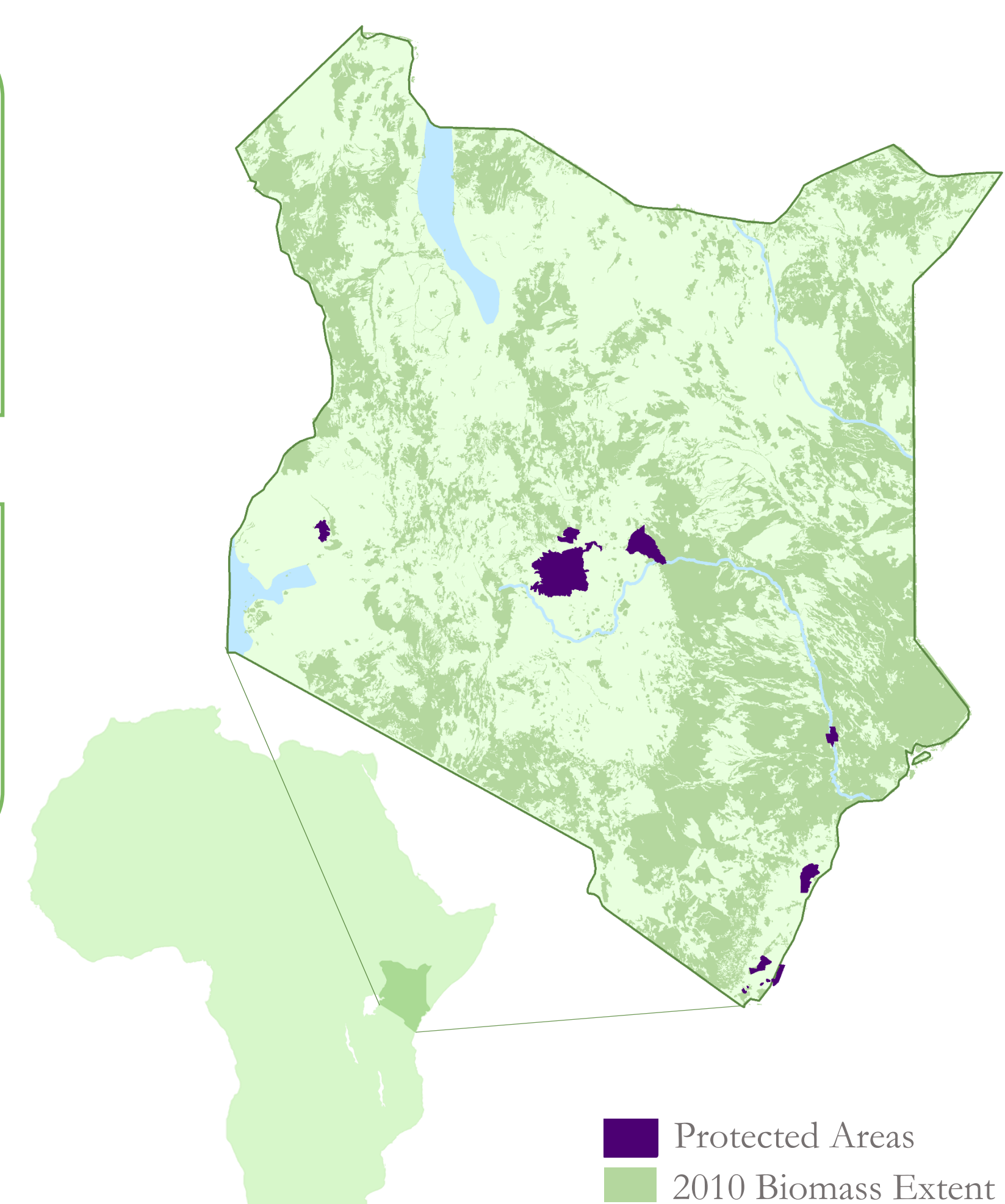
## Objectives

- **Estimate** the amount of above-ground carbon stored in 14 protected areas established by GEF in Kenya
- **Forecast** the amount of above-ground carbon sequestered in the protected areas in 2020 and 2030

## Earth Observations



## Study Area



## Conclusions

- The 12 study areas are not experiencing rapid changes over the 15 - 20 year study period.
- The low rate of change within protected areas is in stark contrast to the surrounding regions.
- This methodology may be applied to other countries with GEF funding and help justify their 4,443 environmental grants worldwide.

## Project Partner

The Global Environment Facility, Independent Evaluation Office

## Acknowledgements

Dr. Compton J. Tucker, NASA Goddard Space Flight Center

Dr. John Bolton, NASA Goddard Space Flight Center

Anupam Anand, Dr. Geeta Batra, & Dr. Juha Uitto, Global Environment Facility

Sean McCartney, SSAI/GSFC (DEVELOP)

Heather Mitchell, DEVELOP Volunteer

This material is based upon work supported by NASA through contract NNL11AA00B and cooperative agreement NNX14AB60A. Any mention of a commercial product, service, or activity in this material does not constitute NASA endorsement. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Aeronautics and Space Administration and partner organizations.

