



INVASIVE ALIEN PLANT SPECIES (IAPS) BIOMASS MAPPING, AND
ESTIMATION, THROUGH GEOSPATIAL ANALYTICS

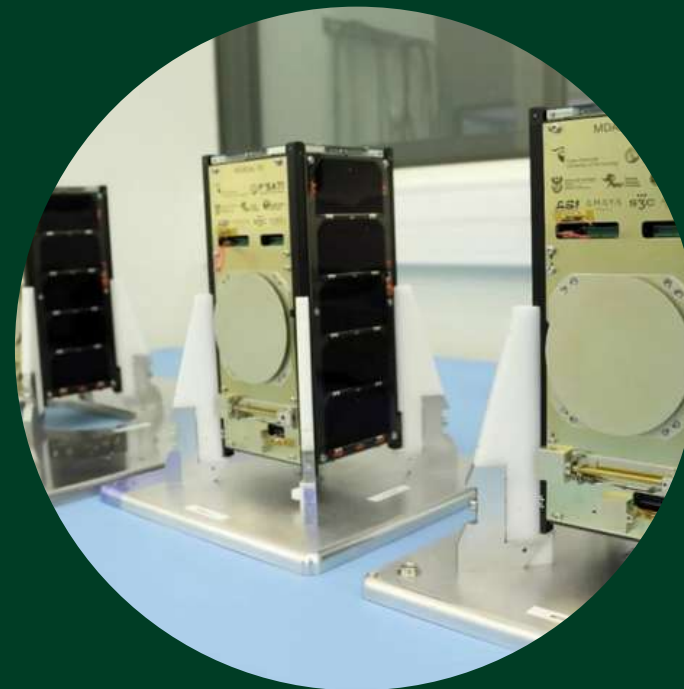


ASTRIFICA
TECHNOLOGIES

About us



**Founded by Jessie Ndaba and
Khalid Manjoo in 2018**



**Drives Africa's growth through space
tech with numerous satellite projects
locally and globally**

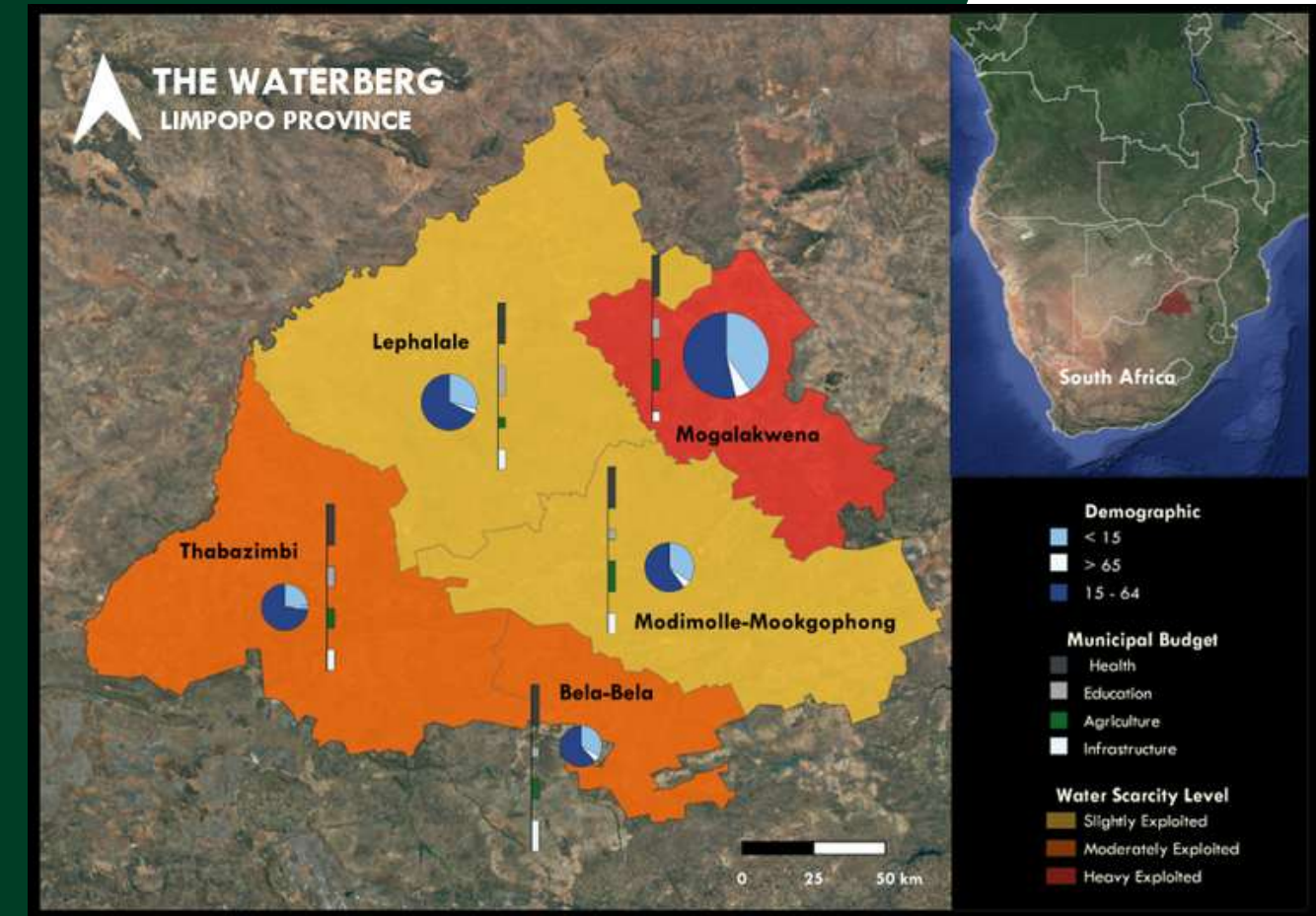


**Accolades:
2022 Presidential Award for Black
Industrialists and Exporters.**

Our First Encounter

Invasive Alien Plant Species (IAPS) – In The Waterberg

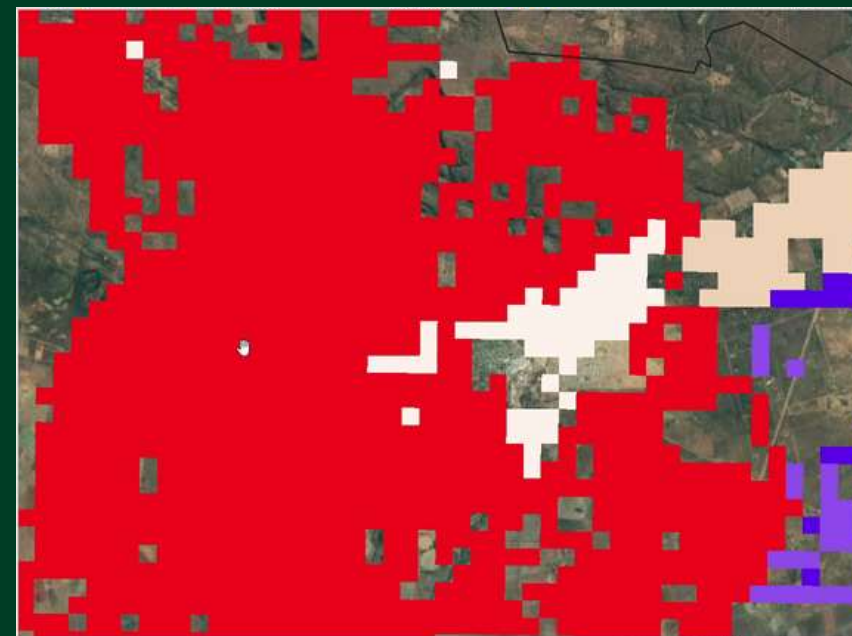
A water scarce region plagued by IAPS, our task was to map where the IAPS were, estimate their biomass, and understand the impact they have on the region



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IMOVE

DID YOU KNOW: IN
2018, IAPS CAUSED
DAY-ZERO IN CAPE
TOWN TO BE
60 DAYS EARLIER



Data Deficiencies

- **Outdated datasets** – NIAPS 2010
- **Very Coarse datasets** – NIAPS 2010, SAPIA.
- **It would take approximately 90 years to survey South Africa** using traditional methods – NIAPS 2010

NEOSS Partnership

Objectives

Classification
Maps

BIOMSASS
Economy

Sampling

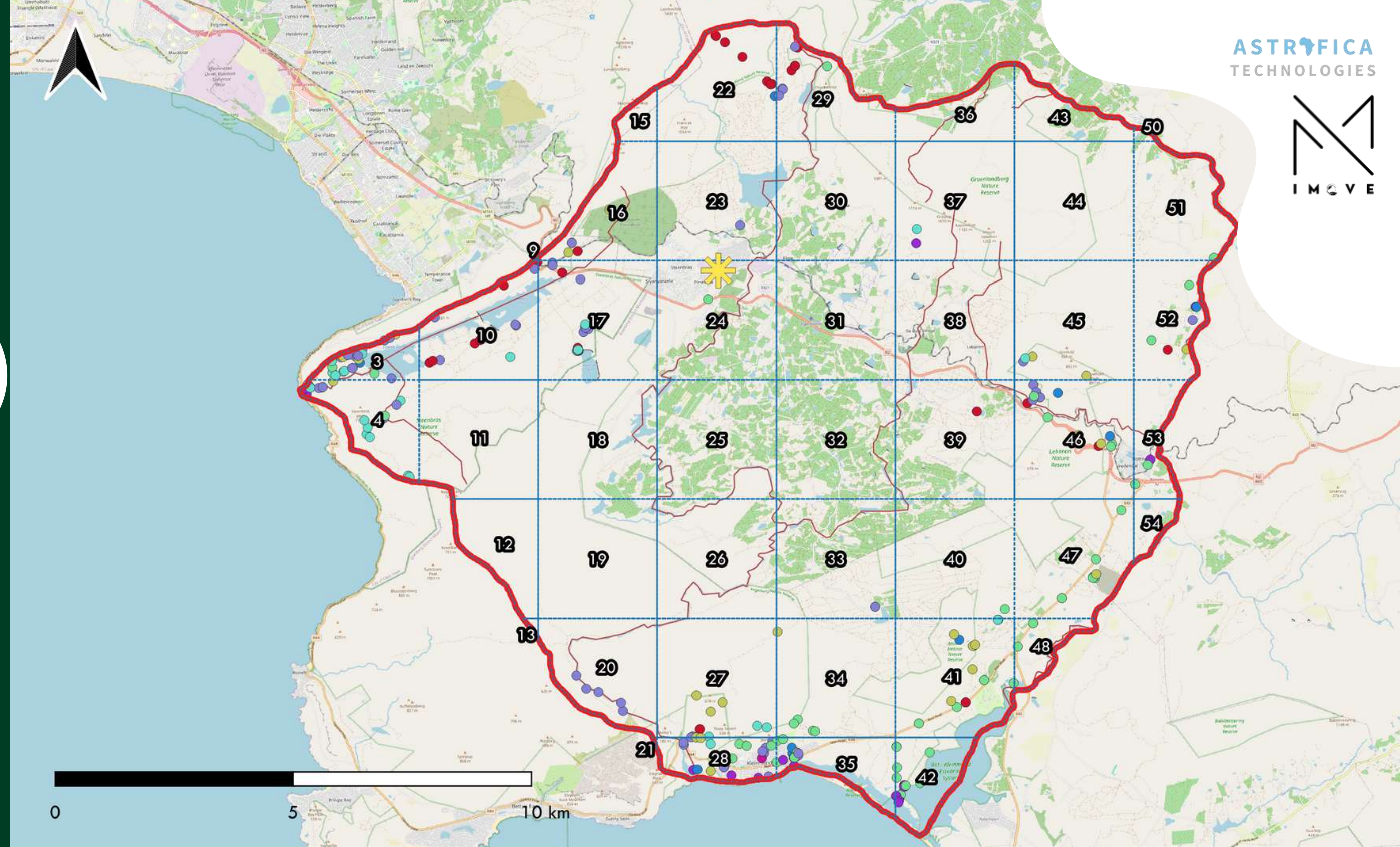
IAPS
Awareness

Our Area of Interest

Grabouw-Kleinmond-Botrivier
Western Cape

High levels of IAPS infestations
Proximity to the Steenbras dam
Its history with forestry plantations
involving Pine Trees

Our IAPS of Interest Included
subspecies of Pinus/Pine, Acacia,
Hakea, and Eucalyptus



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Grabouw Town



Grabouw ROI



Sampling Zones

IAPS

Acacia cyclops



Acacia longifolia



Acacia saligna



Eucalyptus conferruminata



Hakea sericea



Leptospermum laevigatum



Pinus pinaster



Pinus radiata



Paraserianthes lophantha

Navigating the Thicket



The Kogelberg Biosphere Organisation

We were fortunate enough to collaborate with South Africa's oldest biosphere



A Field Day!

We got to meet with Corlie and her team while clearing dense IAPS infestations, and gained insight into their operations and management practices



Three Phases of Sampling

1

Baseline
data

2

AOI
Scouting

3

Field
Collection

A day of Plentiful insight

Goals of The Workshop

- IAPS awareness
- **Share** our project
- Engage with **locals**
- Gauge project interest

Who Attended

- DFFE, DOA, Cape Nature, CoCT - IU, The Nature Conservancy
- **local** conservation orgs.
- The Kogelberg Biosphere field team consisting of **local community members** from **underprivileged communities**.

Workshop Outcomes

- Garnered interest in the project
- Unique and Insightful feedback



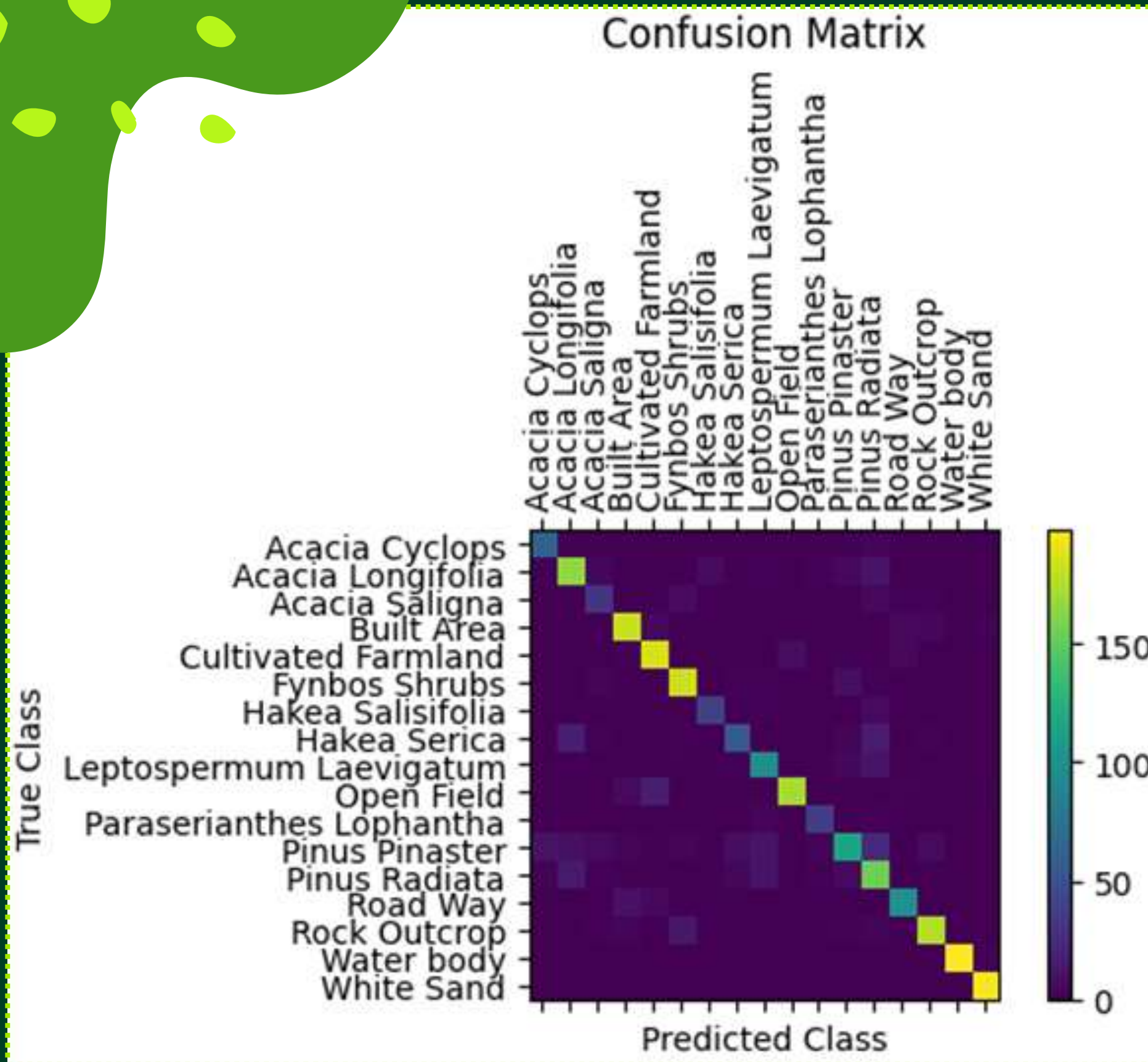
How we generated the maps

IAPS Model

- **MLP** model
- Vegetation and topographic data
- 64/16/20 split
- **84%** over all accuracy (**Sentinel-2**)

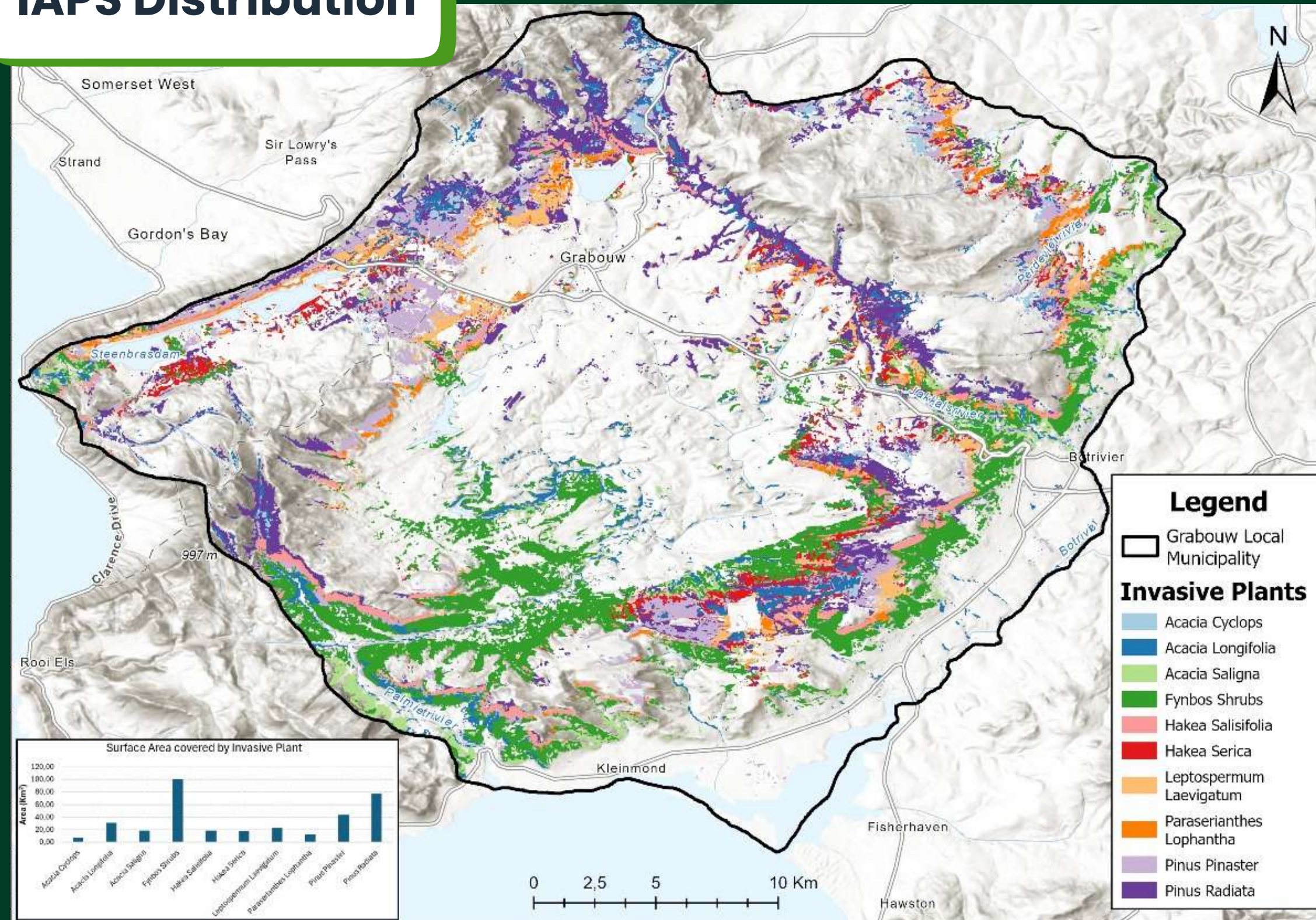
Above Ground Biomass Model

- GEDI Gridded Biomass model
- Refined using Sentinel-1 and ESA Land Cover

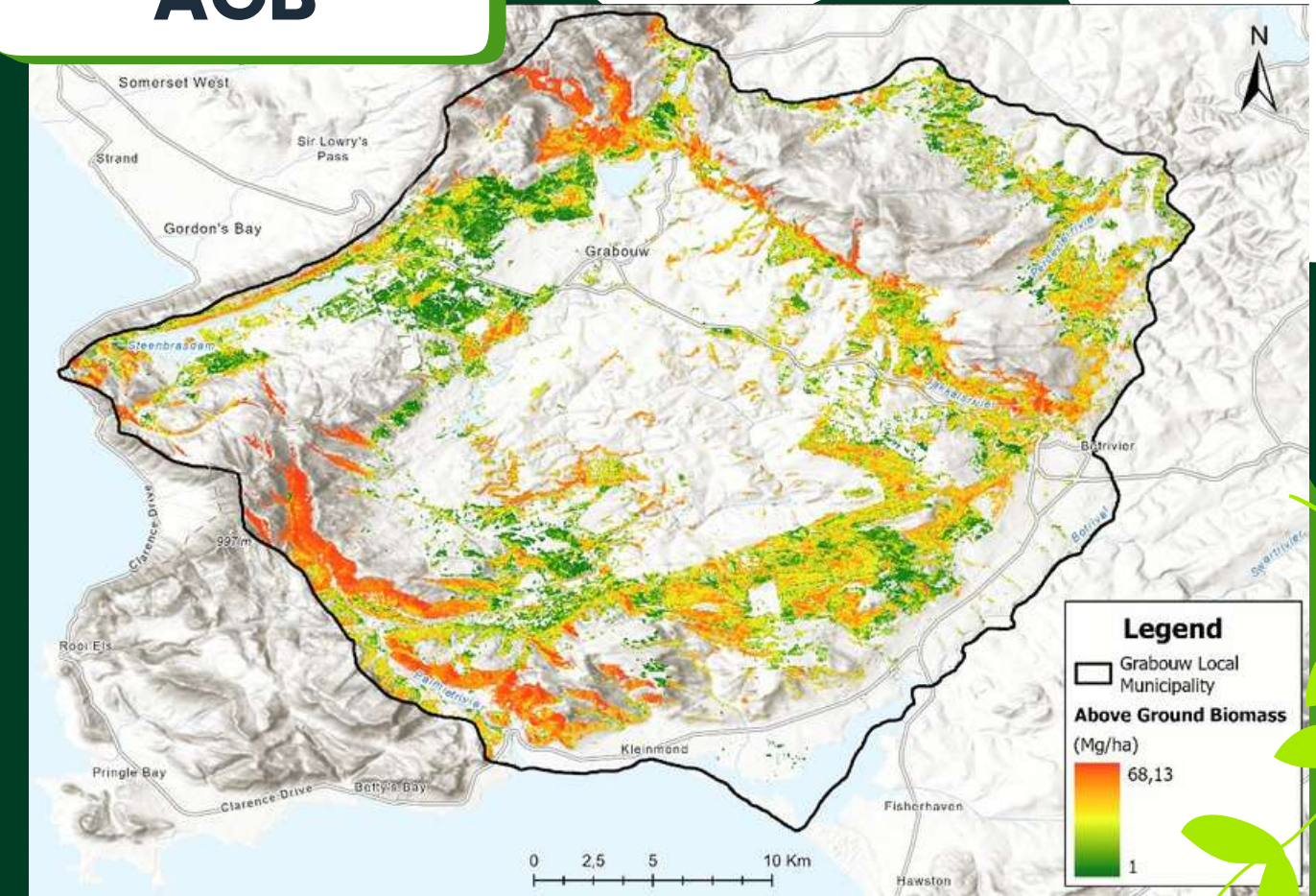


Results

IAPS Distribution



AGB



Live Web Map

<https://ee-invasive-species.projects.earthengine.app/view/grabouw-invasives>

Mapping Invasive Plants in Grabouw

Invasive plant species can significantly disrupt ecosystems, leading to loss of biodiversity and altered habitats. This app maps these species in the Grabouw Local Municipality, Western Cape, South Africa, visualizing their distribution alongside key metrics like Above Ground Biomass (AGB) and Carbon storage. Users can explore the invasive species and their distribution through interactive legends and charts to support land management and ecological research.

Select Invasive Species

All

Legend

Chart

Invasive Legend

- Acacia Cyclops
- Acacia Longifolia
- Acacia Saligna
- Fynbos Shrubs
- Hakea Salisifolia
- Hakea Serica

The Good

QField

IAPS
MAPS

Local
perspective

The Not So Good

Mis-
classifications

Resolution
Limitation

Complex
Biomass
Economy

The Challenges

SILOS!!!

Finding
Collaborators

Bureaucratic
Process

Future Work

Alternative
models

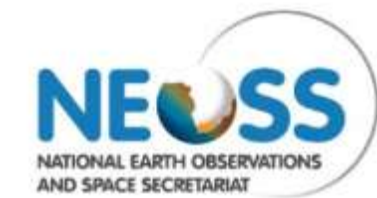
High-
Resolution
data

Project Summary

A SPECIAL THANK YOU TO OUR TEAM AND PARTNERS



Department of Science, Technology and Innovation



National Earth Observations and Space Secretariat



The Council for Scientific and Industrial Research



The Kogelberg Biosphere



Charlotte Mannya-Maxeke Institute