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TAKING THE PULSE OF OUR PLANET FROM SPACE



## Identifying indicators of biodiversity within the northern Antarctic Peninsula region using multisensor satellite data

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## Introduction

- Antarctica: Ice-free areas.
- South Shetland Islands within the northern Antarctic Peninsula region and with a cold maritime climate.
- At present, this region is one of the most rapidly warming places in the world over the past sixty years.
- Rock outcrops, sediments and water bodies are the dominant surface covers.
- These ice-free areas contain fragile ecosystems with a potential biodiversity that is influenced by an active hydrologic cycle during the austral summer.
- There is a concentration of fauna and flora where mosses and lichens are the main vegetation cover and bird and seal colonies have their breeding grounds.





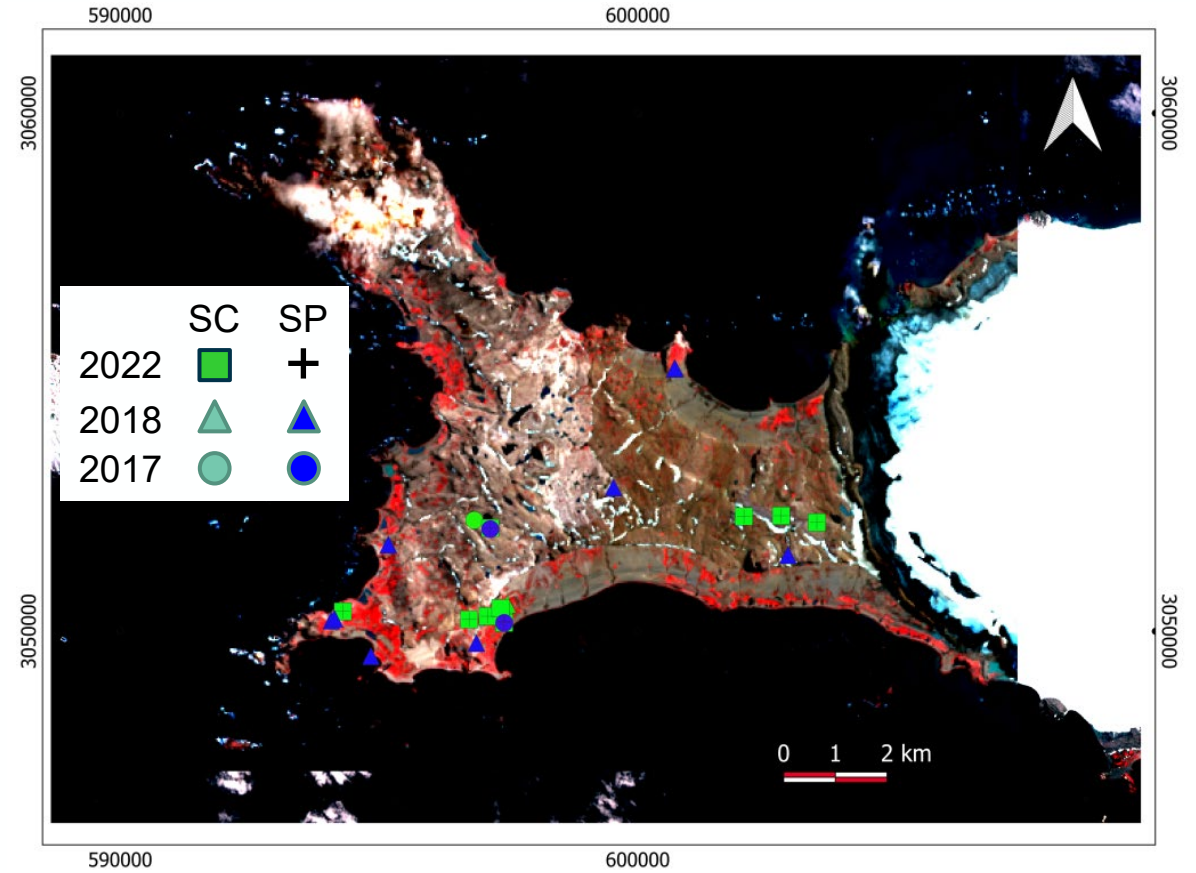
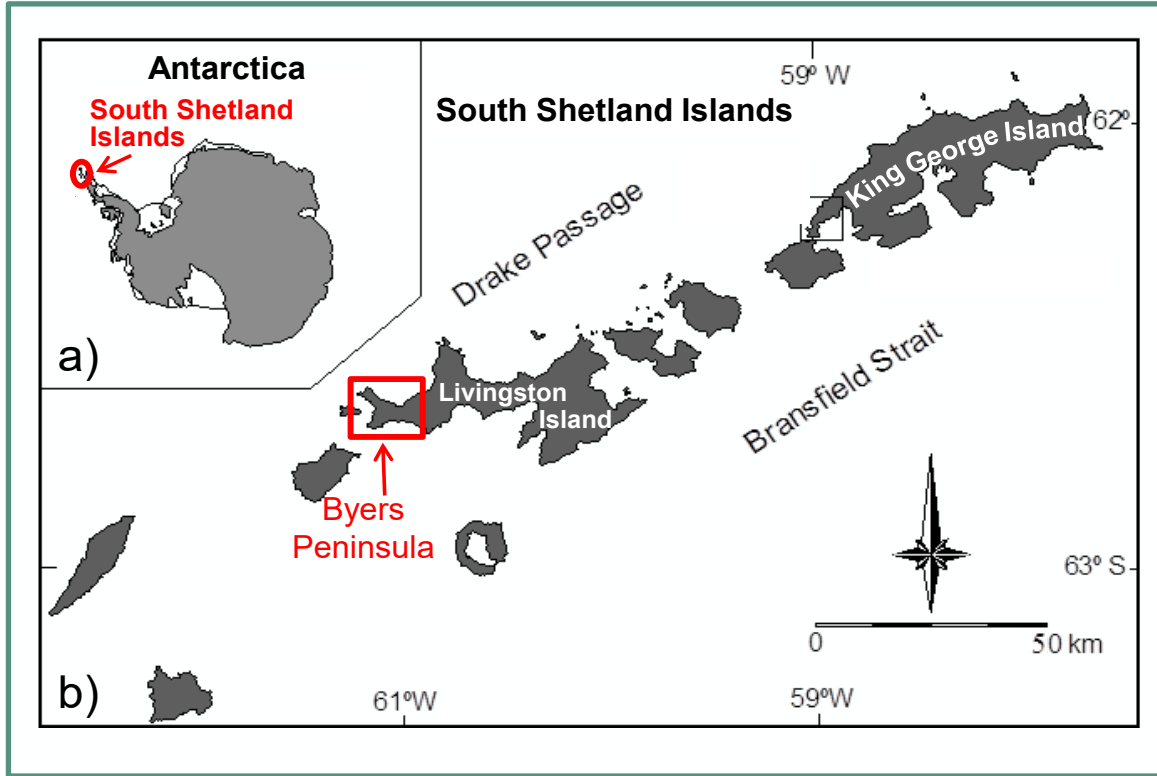
## Objetive

The main objective of this work was to identify different indicators of biodiversity using remotely sensed data within the ice-free areas of the South Shetland Islands.

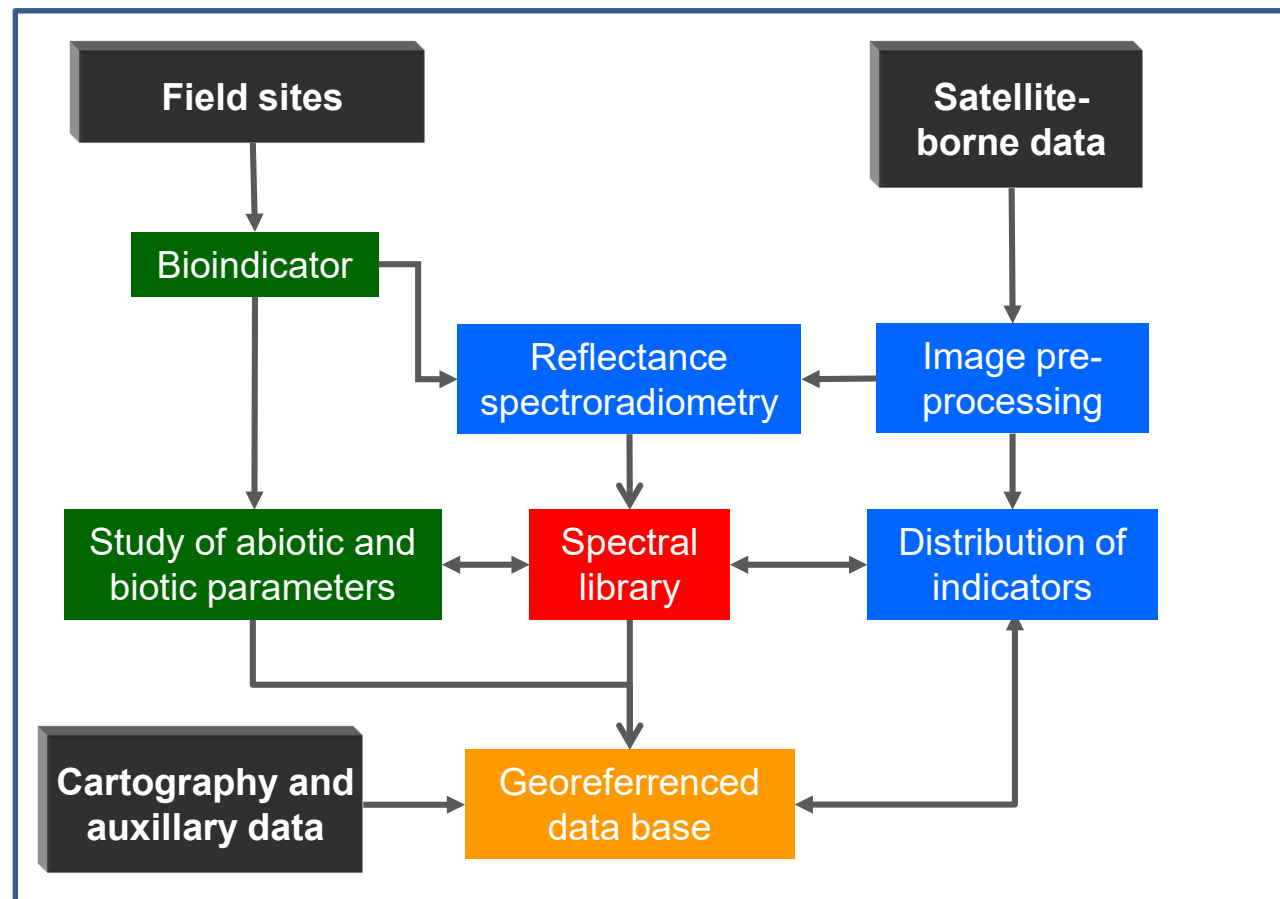
The specific objectives included:

- Identifying these indicators in the field and relate them with spectroradiometry.
- Determining the spectral signature within multispectral images.
- Simultating the spectral signature for EnMap and Prisma data.

# Study area



## Method

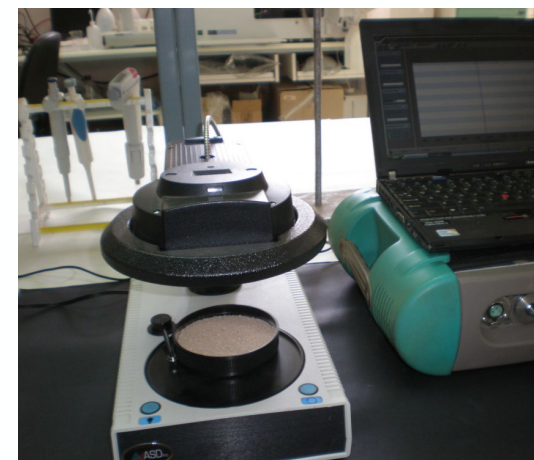




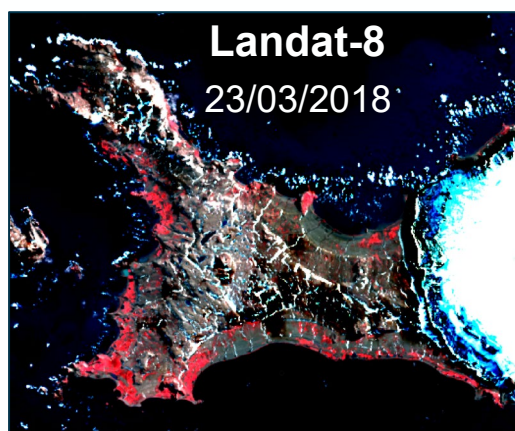
## Data acquisition



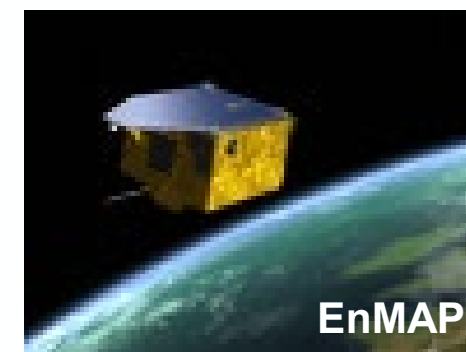
Field campaigns 2017, 2018 and 2022



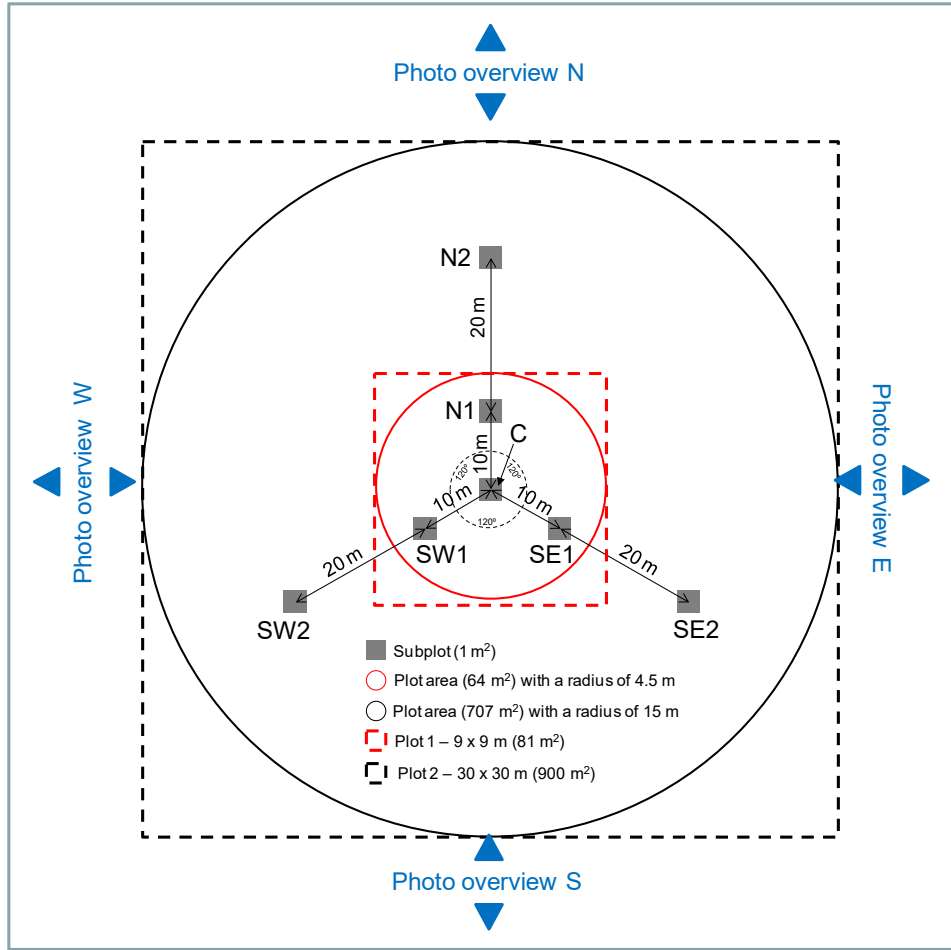
Lab procedure



## Hyperspectral sensors

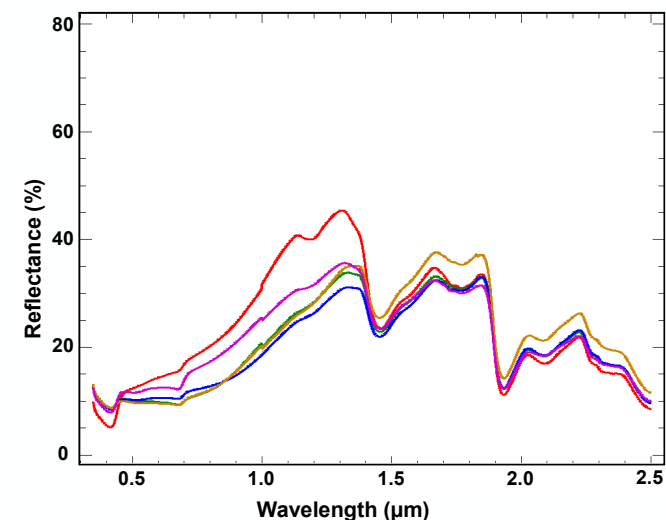
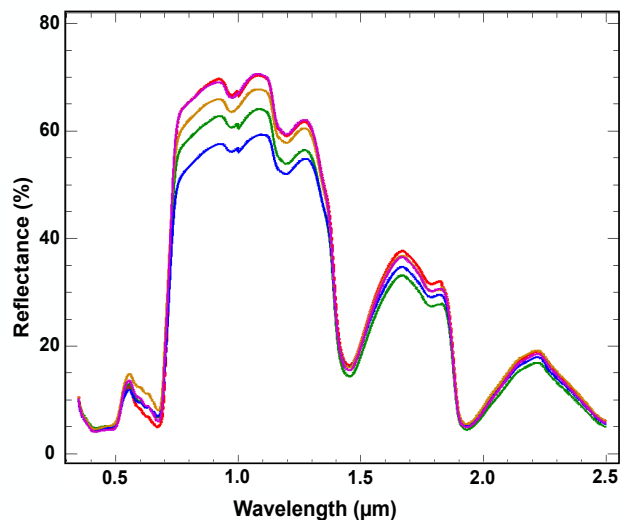
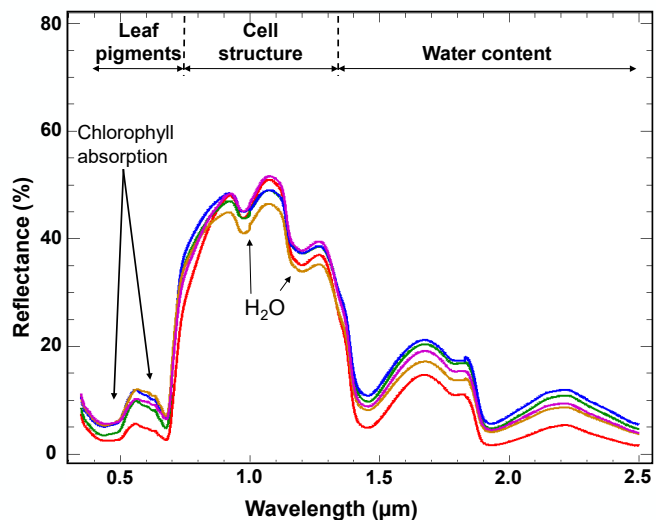


# Sampling strategy





## Vegetation types determined in the field



*Sarmientypnum sarmentosum*



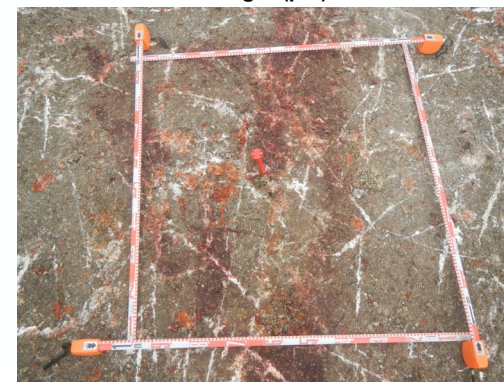
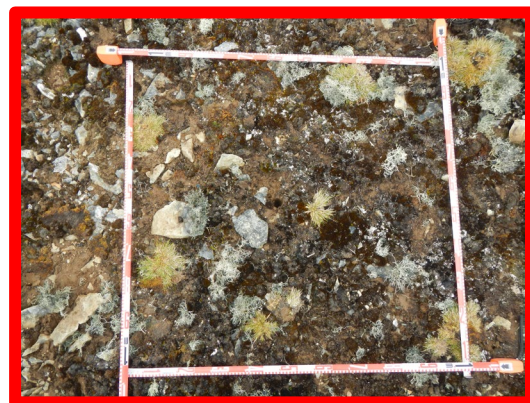
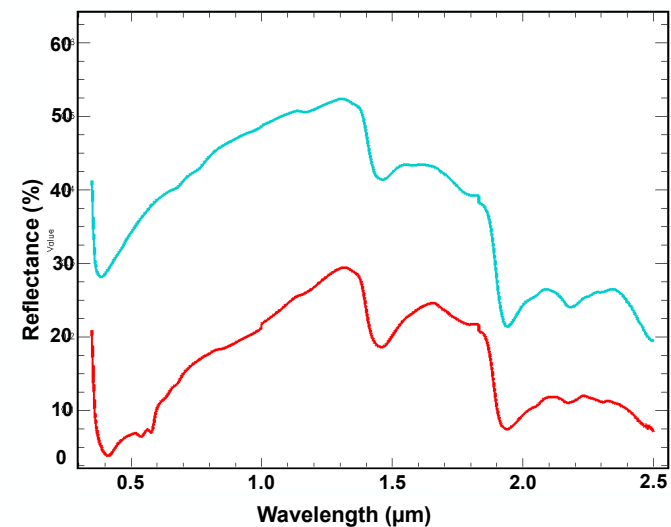
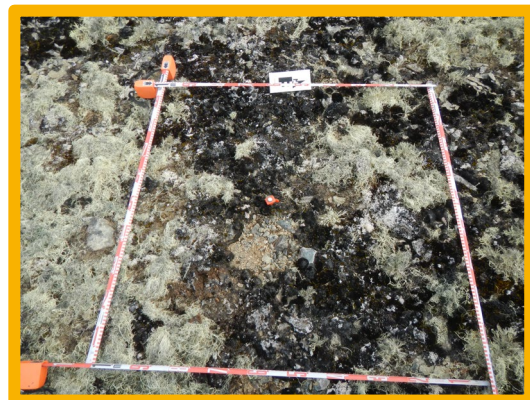
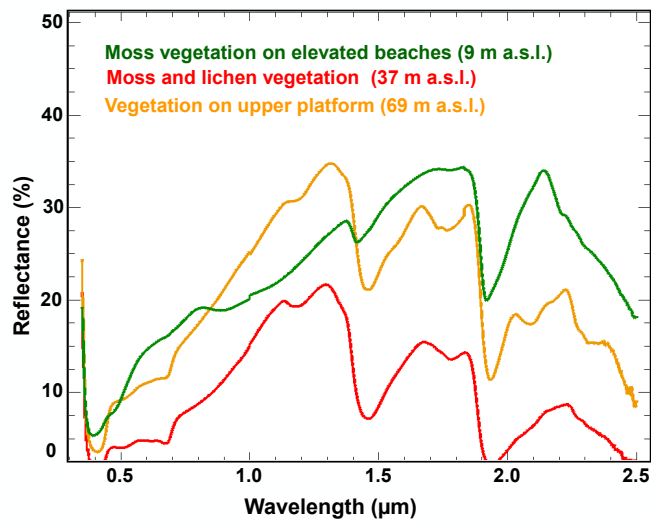
*Deschampsia antarctica* Desv.



*Usnea antarctica*



## Vegetation types determined in the field

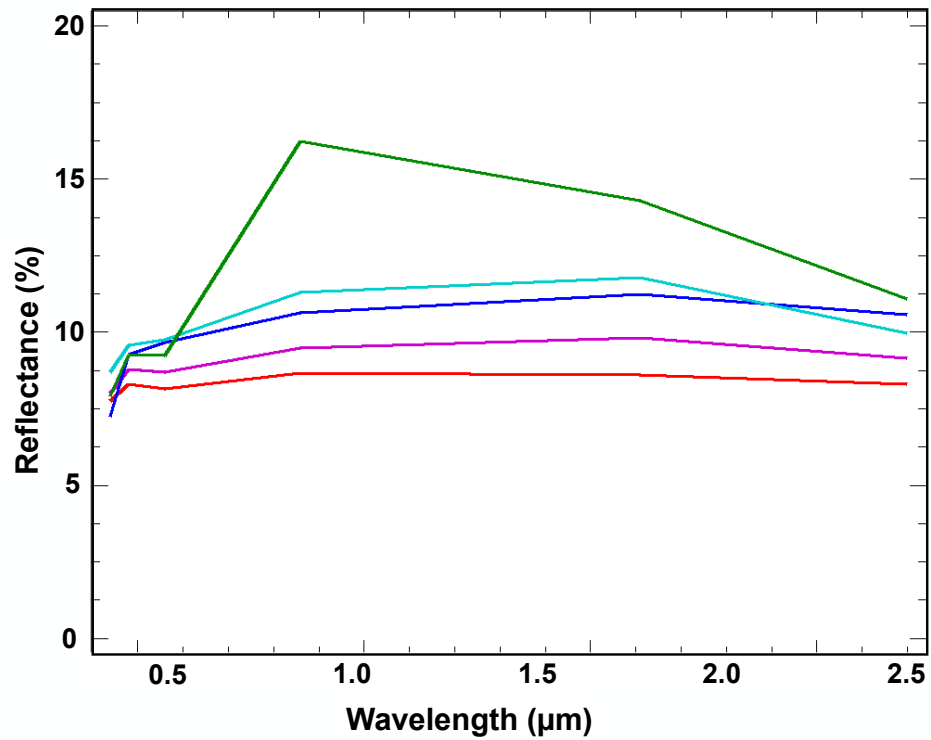


Vegetation cover at different elevation

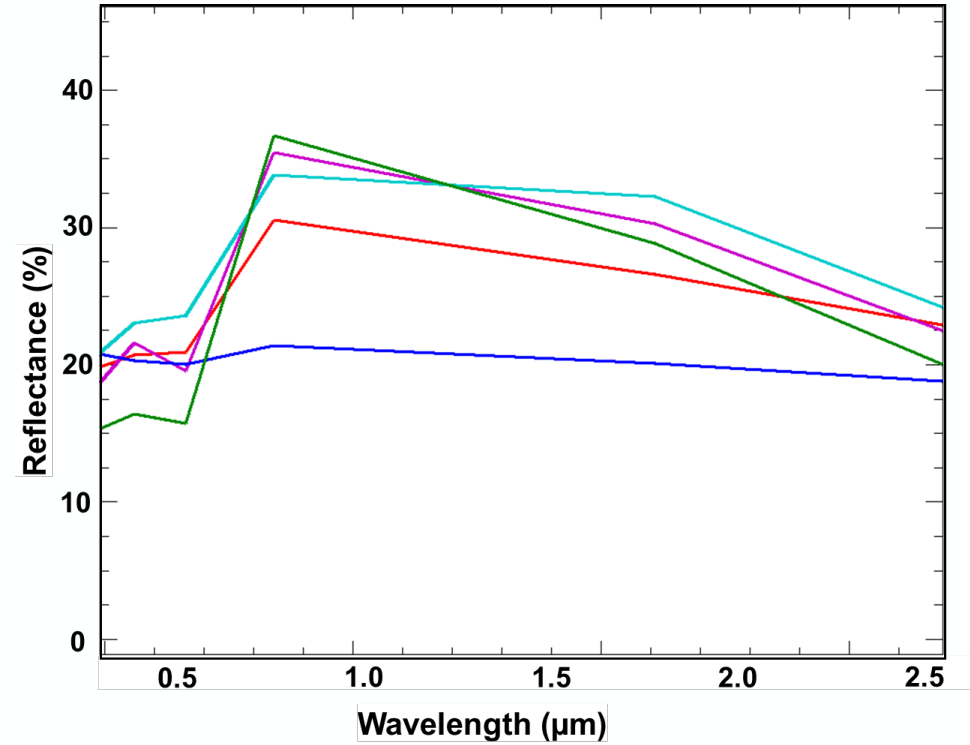
Penguin rookery



## Comparison of bird nesting locations



Landsat 8 (23/03/2018)



Sentinel 2 (12/03/2022)

## Conclusions

- Characterizing ice-free areas are considered important within a highly dynamic area such as the Antarctic Peninsula region where direct accessibility in the field is often limited.
- Site specific information and the compilation of spectral libraries are considered important when working with remotely sensed data and taking into account specific sensor characteristics.
- This ongoing work for a compilation of the Northern Antarctic Peninsula region SPECTral library (NAPSPEC).



## Acknowledgements

- Spanish logistic personnel and the support provided by the Chilean Antarctic Programme.
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