Mapping the coastal margins of the Falklands & South Georgia

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DPLUS065 Coastal Mapping Project – Grant aided by the Darwin Initiative through UK Government funding
Satellite images courtesy of Digital Globe Foundation

Overview

- Why map the coastal habitats?
- Introduction to the project.
- How can you input?

Satellite images courtesy of Digital Globe Foundation

Why do we need coastal habitat maps?

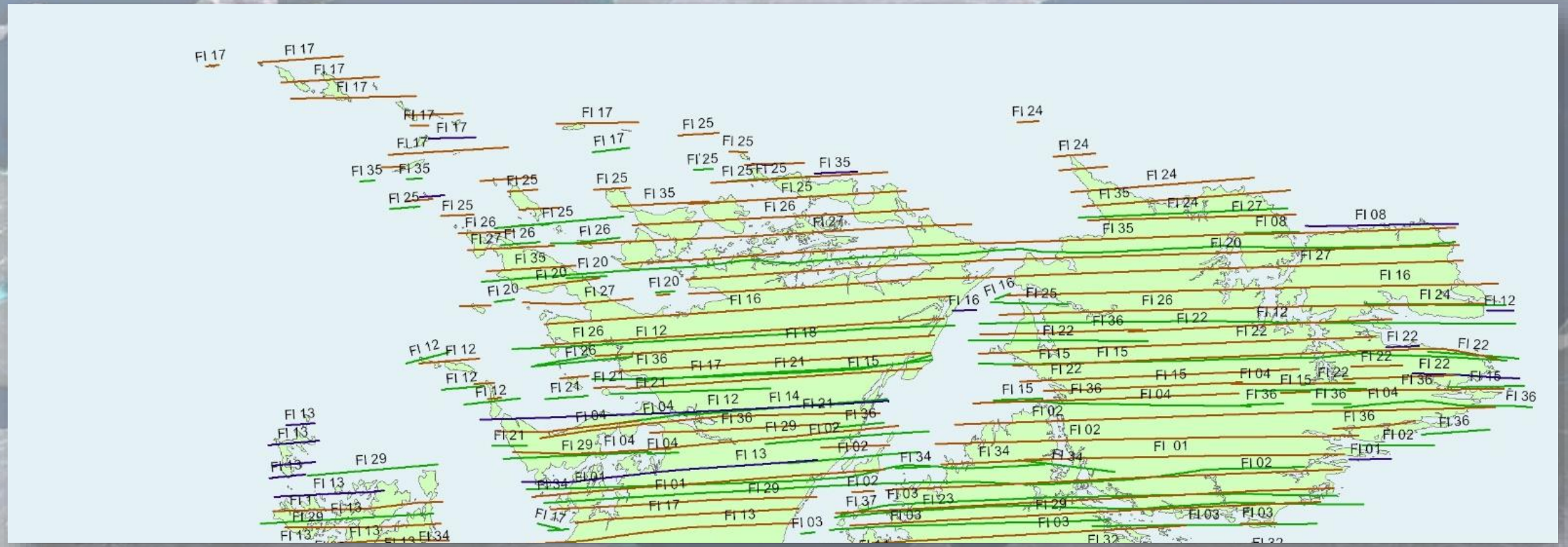
- Before you can plan and manage – need knowledge
- ‘satellite-derived’ baseline habitat maps will be a ‘first’
- Plugging a knowledge gap – FIG/GSGSSI
- Landowners – can quantify areas of water/erosion
- Not a one-off: developing a legacy – creating models, methods and systems for future monitoring

Satellite images courtesy of Digital Globe Foundation

Project introduction

- Three year project ending March 2020
- Five Work Packages:
  - WP1 – 1956 aerial imagery (Falklands only)
  - WP2 – Broad scale (Stage 1) coastal habitat modelling/mapping
  - WP3 – Fine scale (Stage 2) coastal habitat modelling/mapping
  - WP4 – Ongoing planning, protection and monitoring
  - WP5 – Integrate outputs with existing and emerging initiatives

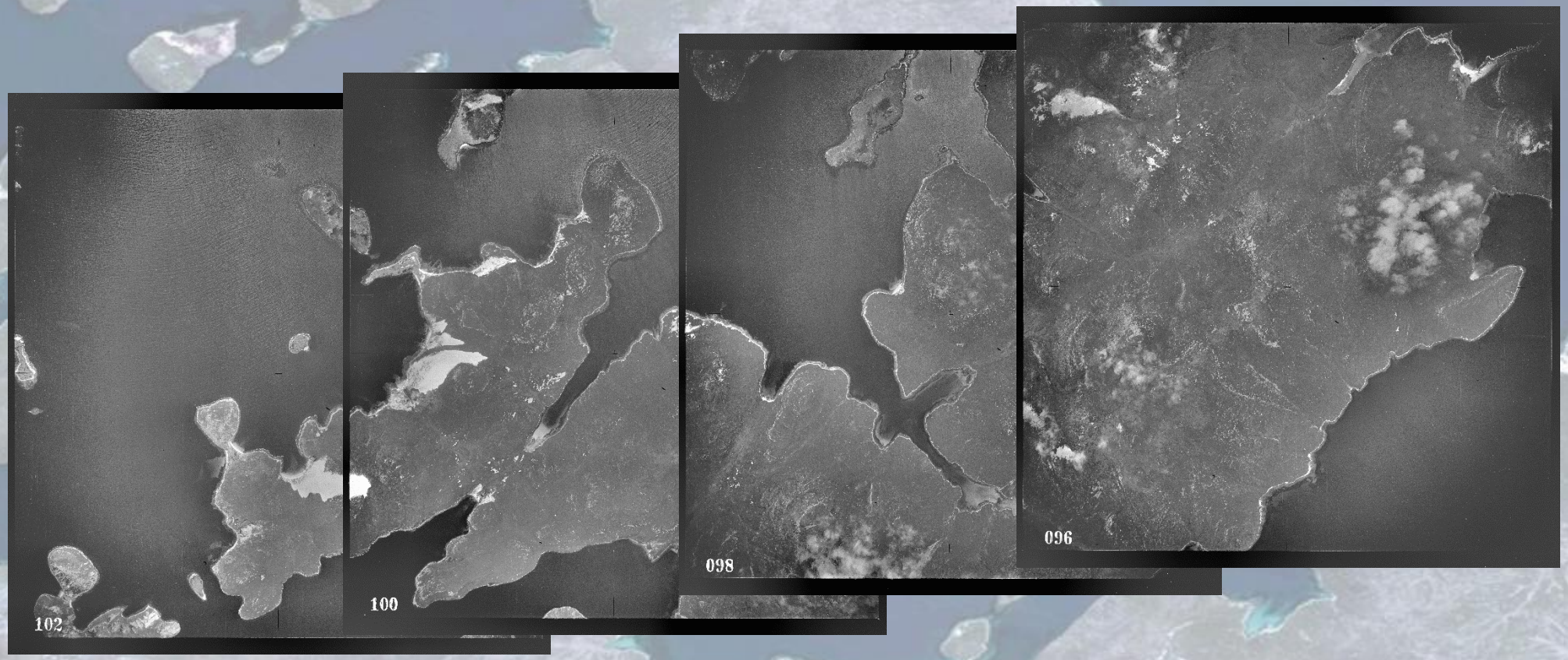
WP1 – 1956 Aerial Imagery



- Due to deliver – end of Sept ‘18

Satellite images courtesy of Digital Globe Foundation

WP1 – 1956 Aerial Imagery



- Due to deliver – end of Sept ‘18

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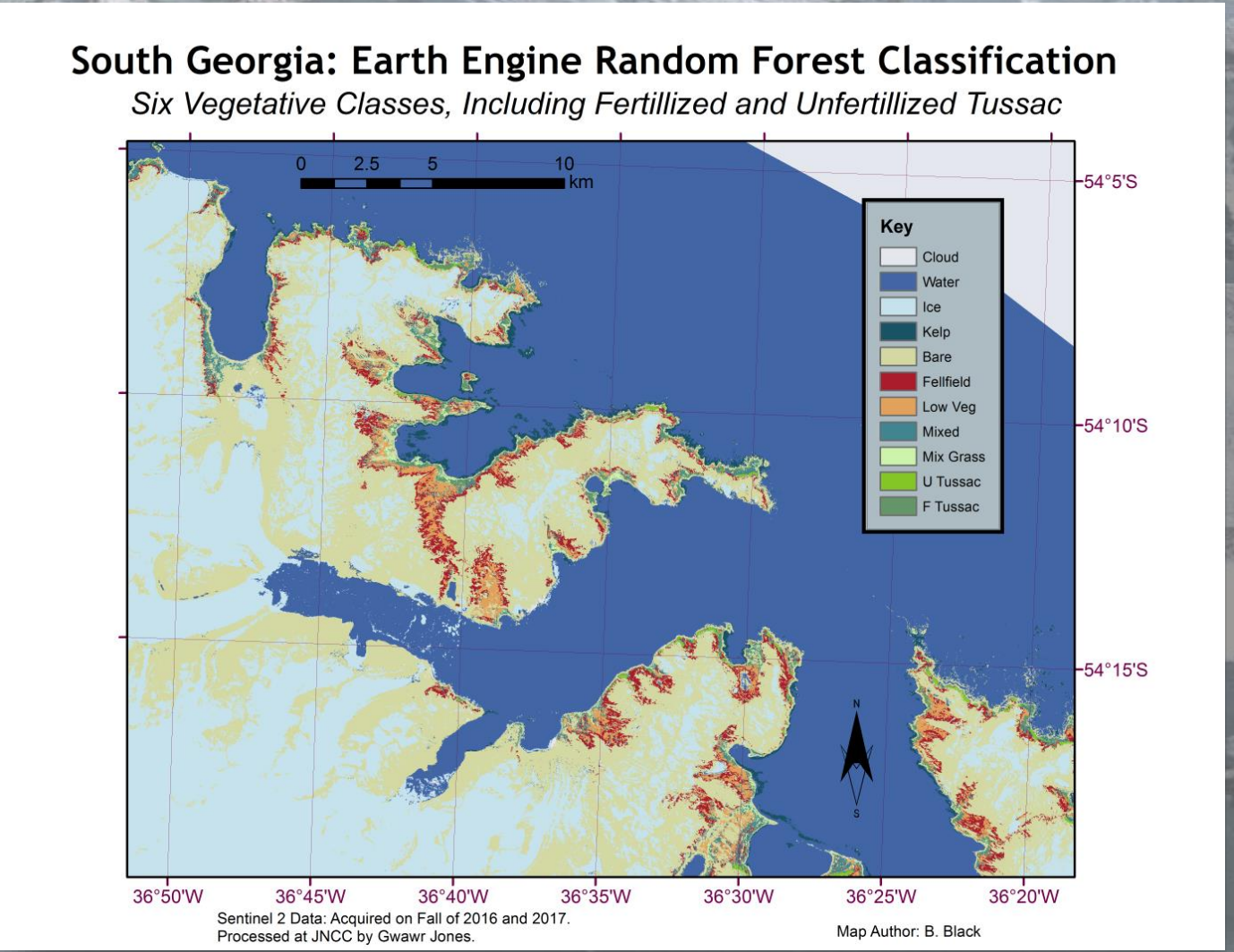
WP2 – Broad scale coastal habitat maps

- Train software (machine learning) using ground validation data to classify satellite data (10m res)
- Using freely available data in Stage 1
- South Georgia Stage 1 maps:
  - Terrestrial – end March ’18
  - Marine – end July ’18
- Falklands Stage 1 maps:
  - Terrestrial & Marine – end Sept ‘18

Satellite images courtesy of Digital Globe Foundation

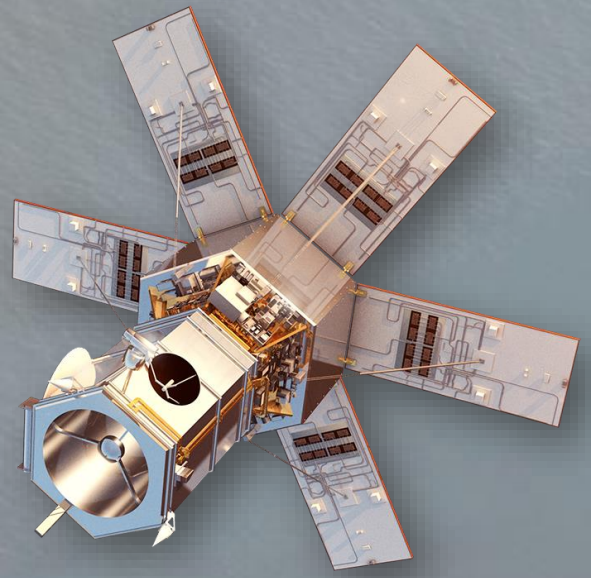
WP2 – South Georgia



Satellite images courtesy of Digital Globe Foundation

WP3 – Fine scale coastal habitat maps

- Fine scale mapping will be undertaken:
  - For areas highlighted by stakeholders (YOU) as a priority
  - To identify/address significant areas of uncertainty in the classification



- Very high resolution satellite imagery (~50cm resolution) will be used to map priority areas
- Digital Globe Foundation have generously provided imagery of SG and FI for the project
- Stage 2 maps delivered by June ‘19

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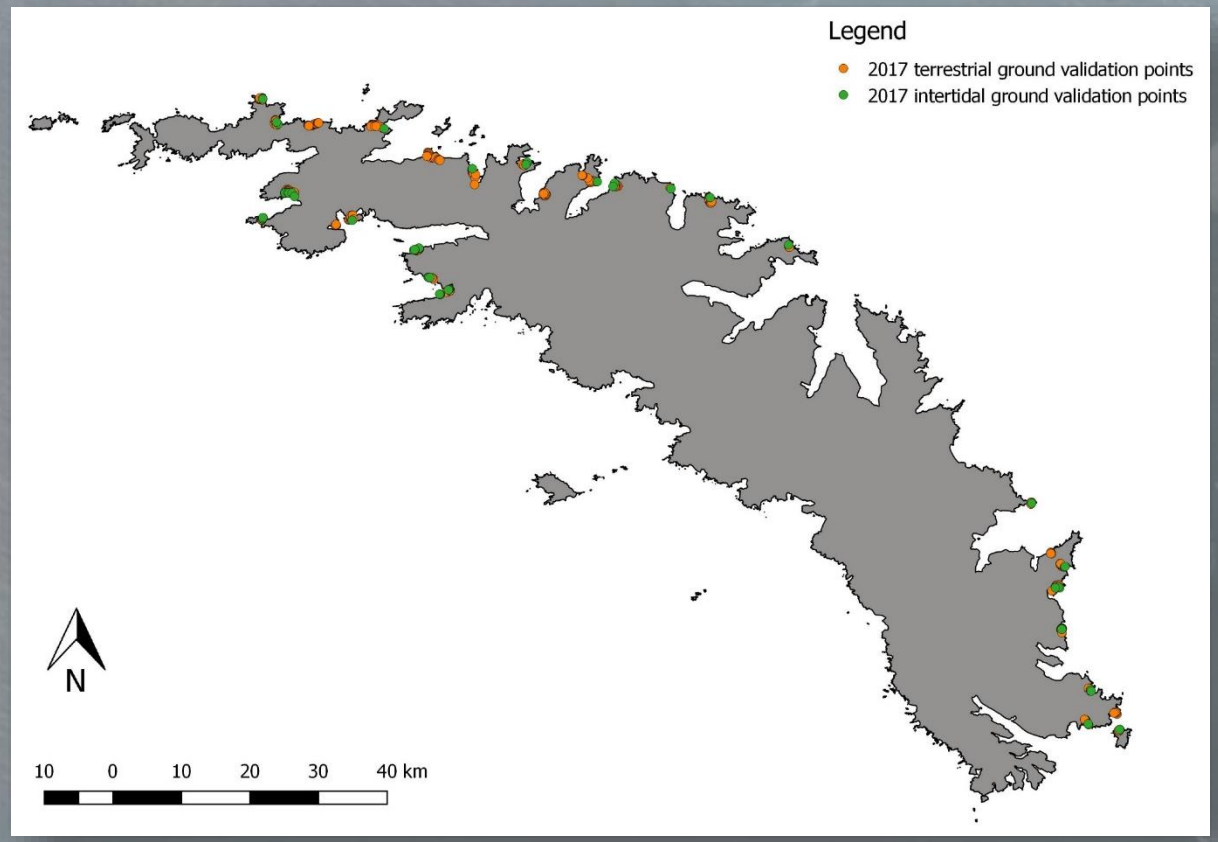
Satellite images courtesy of Digital Globe Foundation

WP2 & WP3 - Fieldwork

- Nov/Dec 2017 – Field expedition to South Georgia



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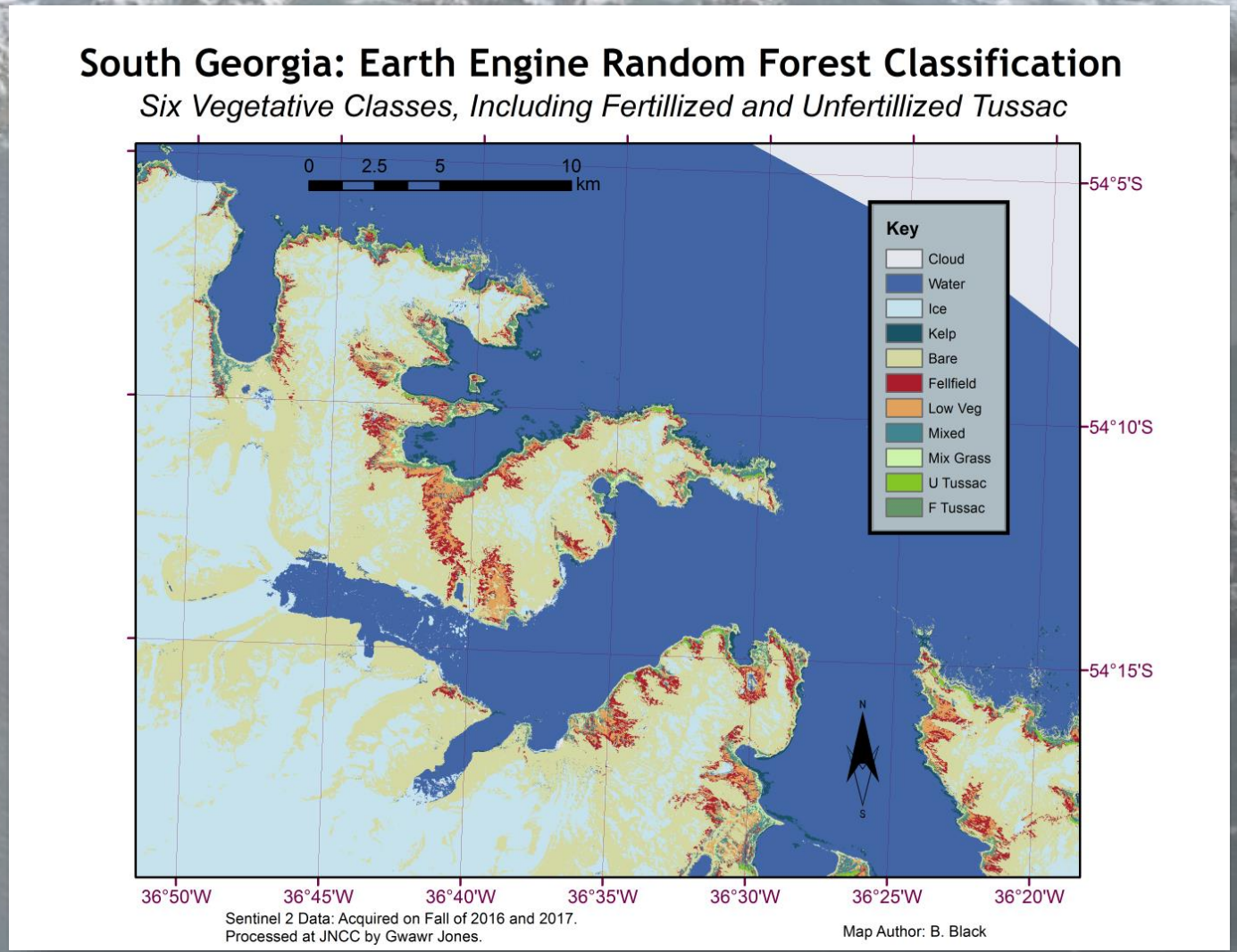
WP2 – South Georgia



Training Overall Accuracy: (0.9922)

	0	1	2	3	4	5	6	7	8	9	10
0	57										
1		212			1						
2		1	149								
03		2		61							
4					123						
5						15					
6							21				
7					1			61			
8					1				28		
9										12	
10											27

Validation Overall Accuracy: (0.7401)

	0	1	2	3	4	5	6	7	8	9	10
0	45	2	1		1						
1	1	179	4	1	10						
2		6	121	1	7				1		
3		6	1	54	2						
4	1	14	4	2	90			10			1
5		1	1		12	1		8	1		1
6					2	1	5	13	2		3
7					11	1	1	28	4		2
8					4		1	15	6		4
9								4		0	1
10				2	3			13	3	1	15

Satellite images courtesy of Digital Globe Foundation

WP2 & WP3 - Fieldwork

- Collection of very high resolution drone imagery – FI & SG
- Subtidal data collection (FI):
  - Working with Shallow Marine Surveys Group to collect sidescan sonar, drop-down video and diver observations to validate models
- Collection of significant number of ground validation points from around the Falklands – SG methodology

Satellite images courtesy of Digital Globe Foundation

WP4 – Ongoing planning and monitoring

- Training workshop – planned for Q2 (Jul – Sept) ‘19
- Guidance document/manual for undertaking long-term monitoring of the coastal margin

WP5 – Integrate with existing/emerging initiatives

- Review of existing initiatives with Falklands and South Georgia.
- End of project synthesis workshop held Q3 (Oct/Nov) ’19.
- Develop cloud-based system (Google Earth Engine)

Satellite images courtesy of Digital Globe Foundation

How can you input?

- Bi-annual Stakeholder meetings
  - Today, August 2018 (workshop), March 2019, Aug/Sept 2019
- Stakeholder workshop – w/c 6th August 2018
  - Review broad scale (Stage 1) maps for Falklands & South Georgia
  - Identify priority areas for fine scale (Stage 2) mapping
  - These may be priority habitats or temporal aspects etc.
- Training workshop - Q2 (Jul – Sept) ’19
- End of project synthesis workshop
  - Looking at how project outputs can be integrated into systematic conservation planning

Thank you for listening

We gratefully acknowledge the contribution (through data provision) made by the Falkland Islands IMS-GIS to this project