

Hyperspectral remote sensing and analysis of intertidal zones: A contribution to monitor coastal biodiversity

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Overview:

Hyperspectral remote sensing and analysis of intertidal zones

1. Introduction:
Research goals
and study area
2. Data and analysis approach
3. Results:
Biotope classification
and data accuracy
4. Perspectives of GIS-RS-based
environmental monitoring



Study area



Helgoland Northern Intertidal



1. Introduction – 2. Data analysis – 3. Results – 4. Perspectives
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Slide: 4

Biotopes in the study area



Abrasion platform of the northern intertidal



Red algae area (Mastocarpus)



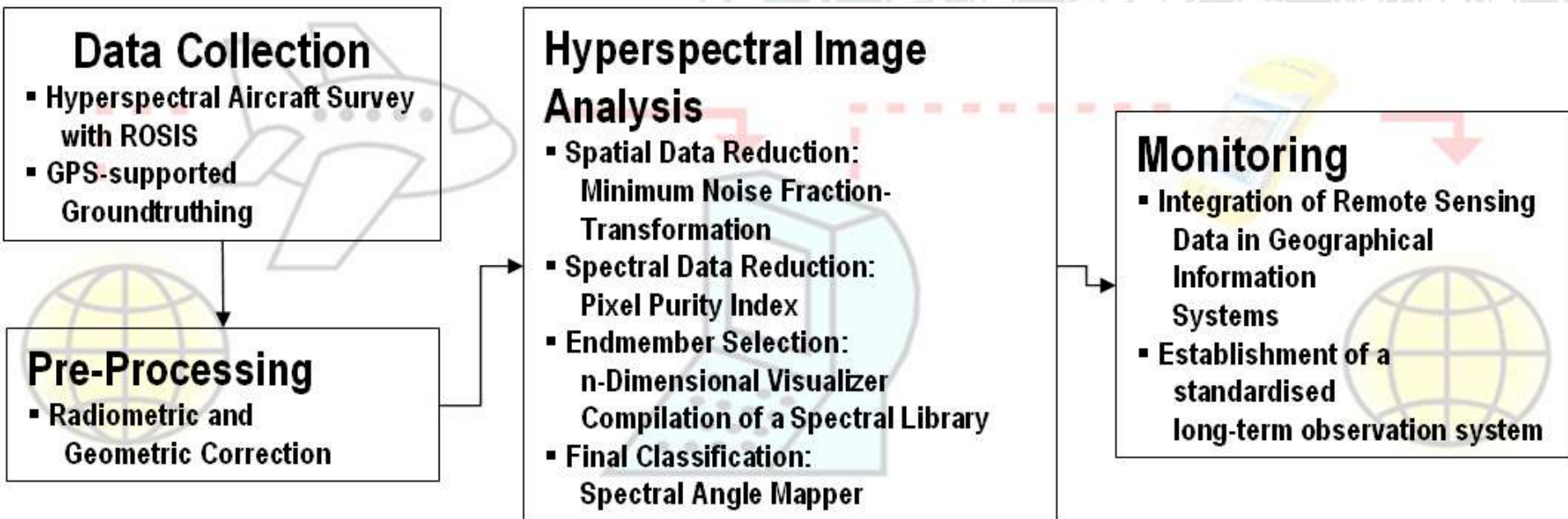
Green algae zone (Enteromorpha)



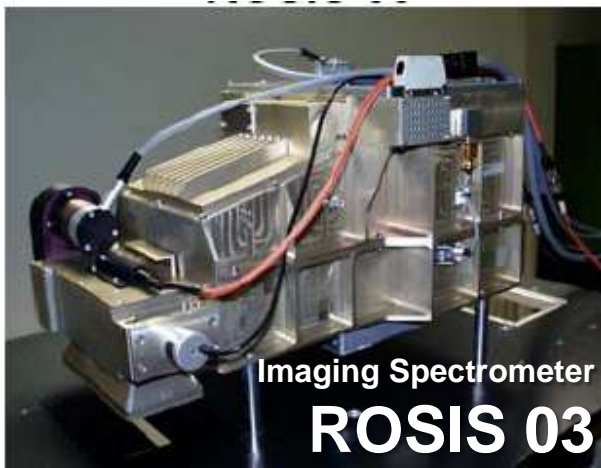
Musselbed with brown algae (Mytilus and Fucus)



Working scheme

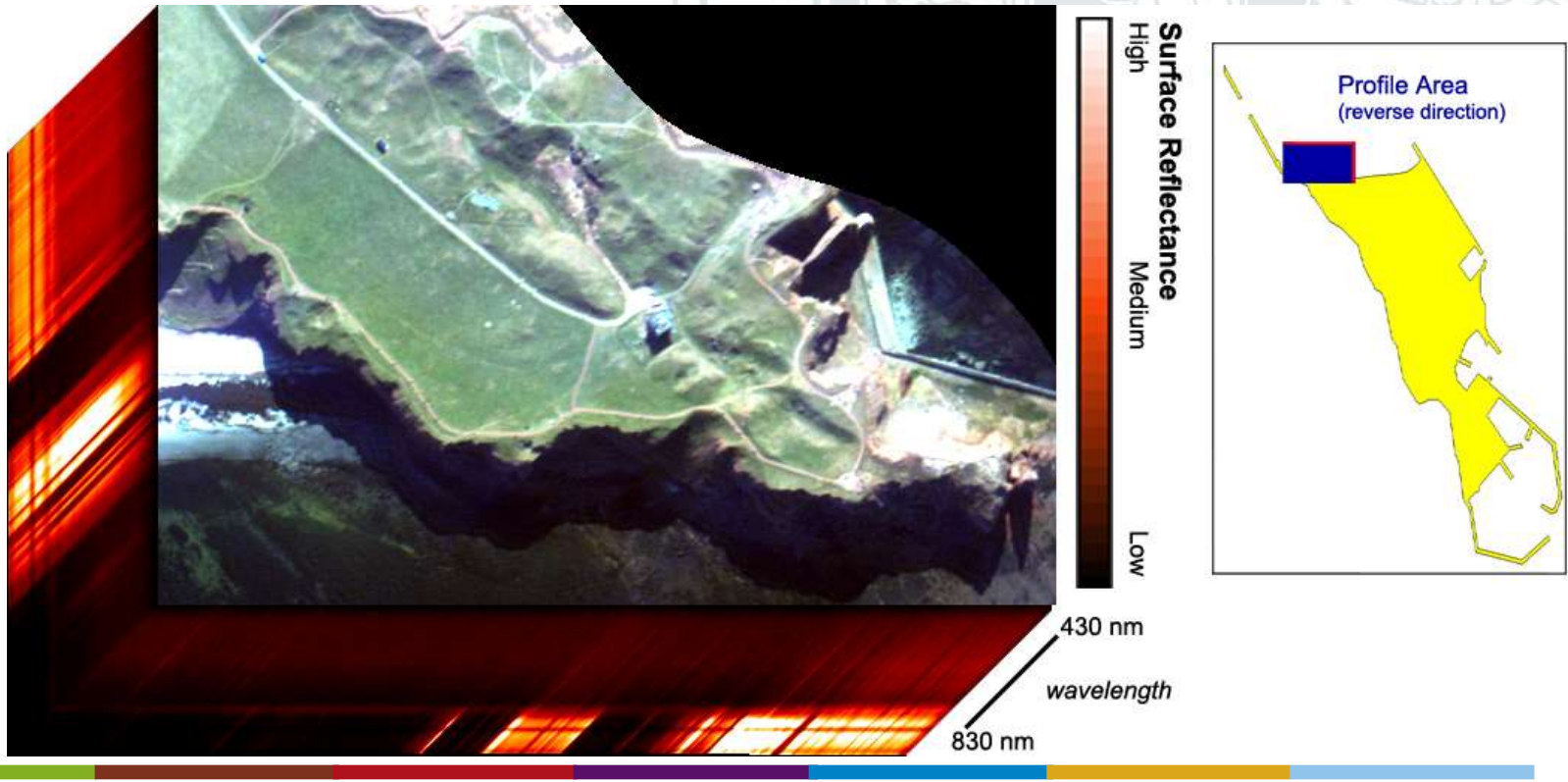


Data

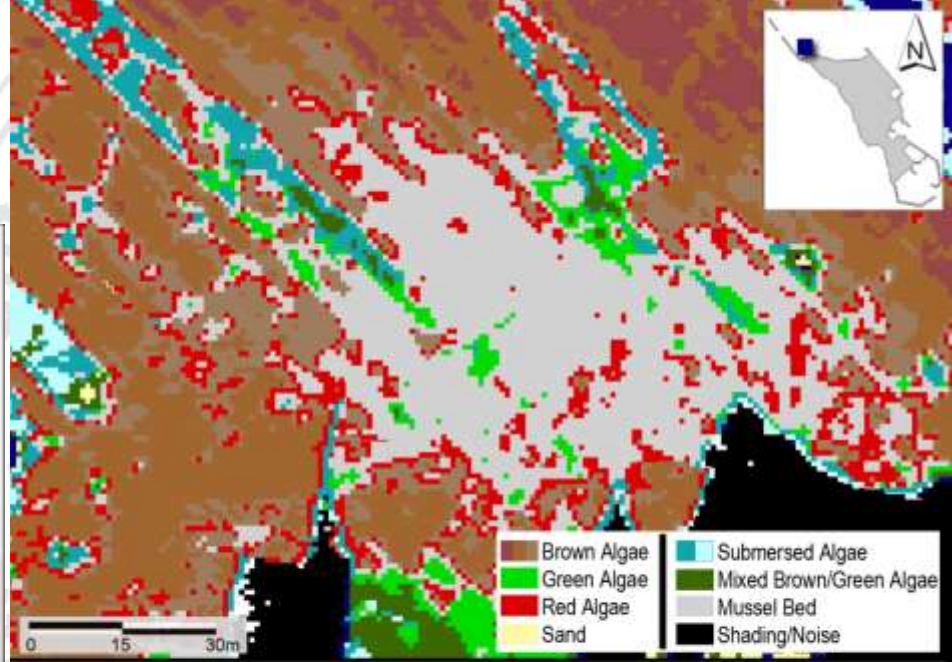
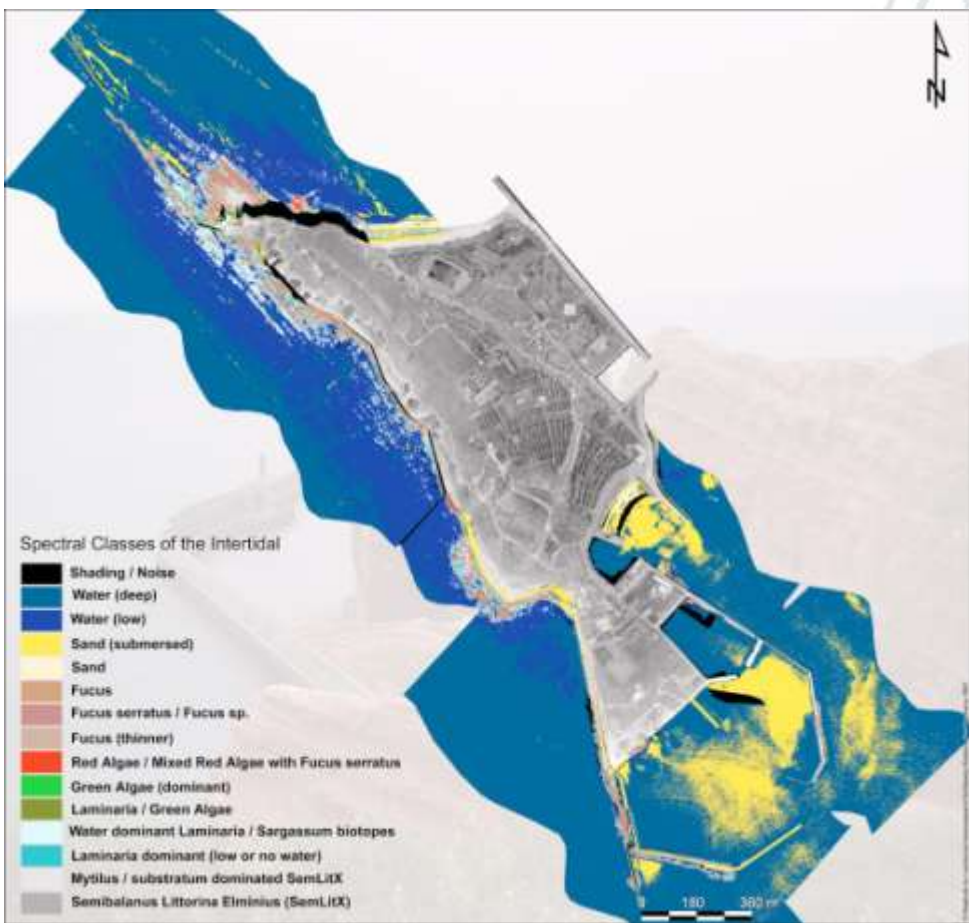


Imaging Spectrometer
ROSIS 03

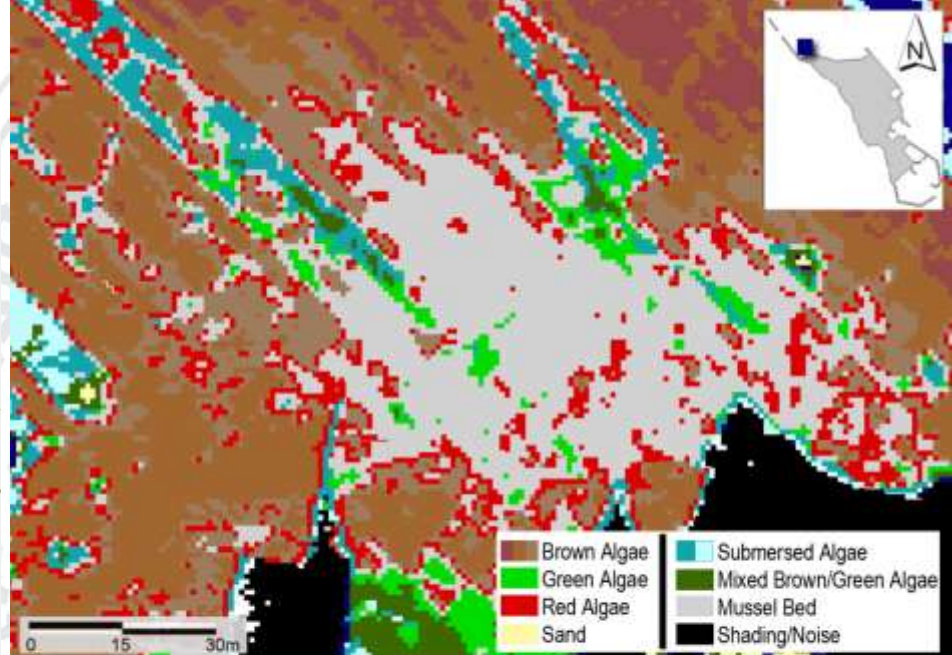
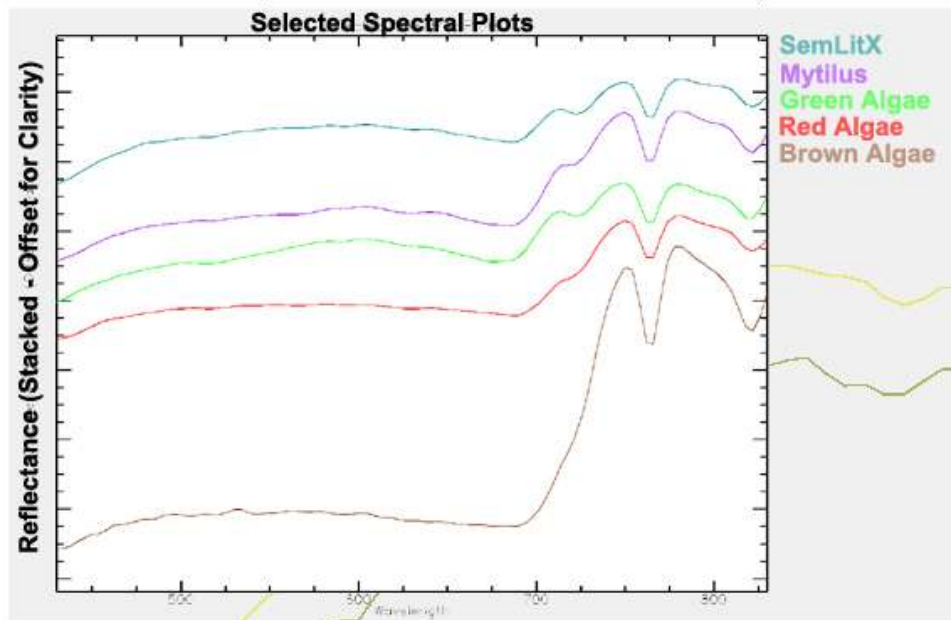
Scanning	Pushbroom
Spect. Coverage	0,43 - 0,86 μm
Bandwidth	4,0 nm
FOV	$\pm 8^\circ$
IFOV	0,56 mrad
Px / Line	512
No. of Bands	115
Scan Frequ.	88 Hz
Digitisation	14 Bit
Calibration	Int. Spec. Calibr.
Operated since	1992/1999



Biotope classification



Biotope classification



Unknown	Fucus serratus (Fser)
Accumulation	" degraded
Ascophyllum	FserEnteromorpha
Corralina (Cor)	FserRedalgae
Enteromorpha (Ent)	FserRhodothamniella
FucusLaminaria	Fucus spiralis
Halidrys (Hal)	Fucus
Sargassum	FucusEntPorphyra
	FucusRedalgae

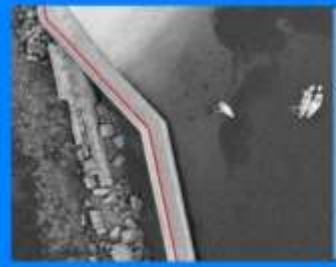
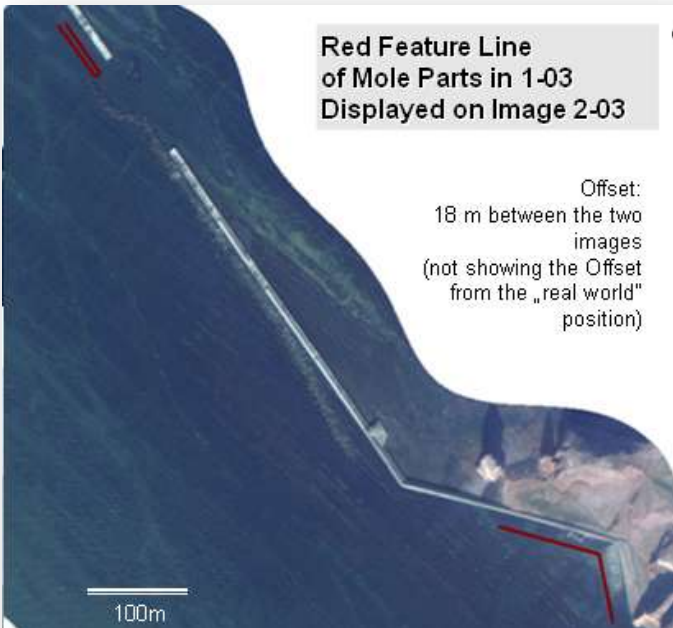


Thematic accuracy

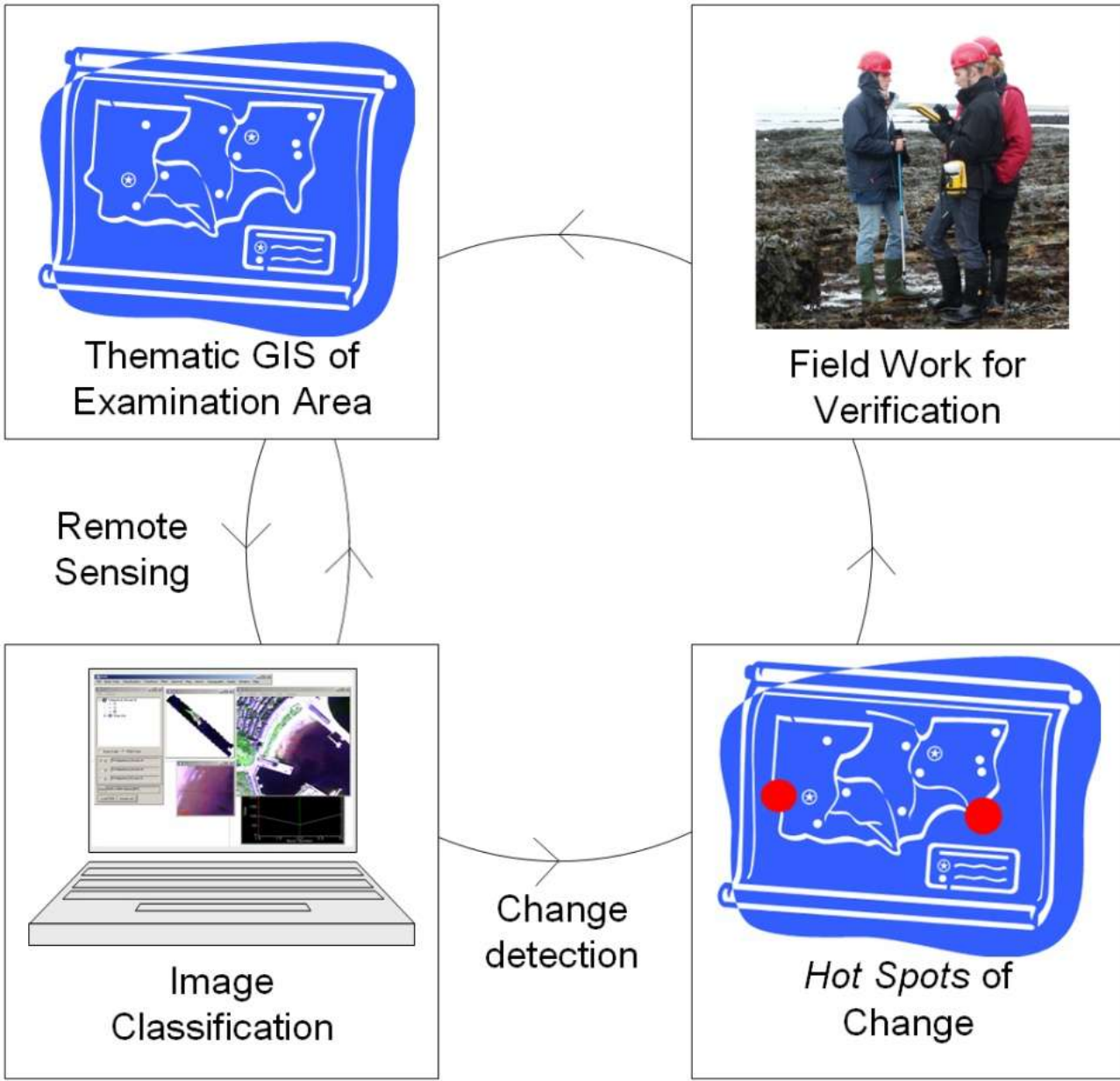
		Reference Data								Total	User's Accuracy %	
		No Vegetation	Brown Algae	Dense Brown Algae	Red Algae	Green Algae	Kelp	Vegetated Channels	Mussel bed			Barnacles
Classified Data	No Veget.	9						6			15	60
	Brown Algae		19		9			4			32	59,4
	Dense Brown Algae			38	4						42	90,5
	Red Algae				24			2			26	92,3
	Green Algae					18					18	100
	Kelp					3	17	8			28	60,7
	Vegetated Channels					1	3	20			24	83,3
	Mussel bed								27	9	36	75
	Barnacles	3							12	30	45	66,7
	Total	12	19	38	37	22	20	40	39	39	266	76,4
Producer's accuracy %	75	100	100	64,9	81,8	85	50	69,2	76,9	78,1	<u>75,9</u>	



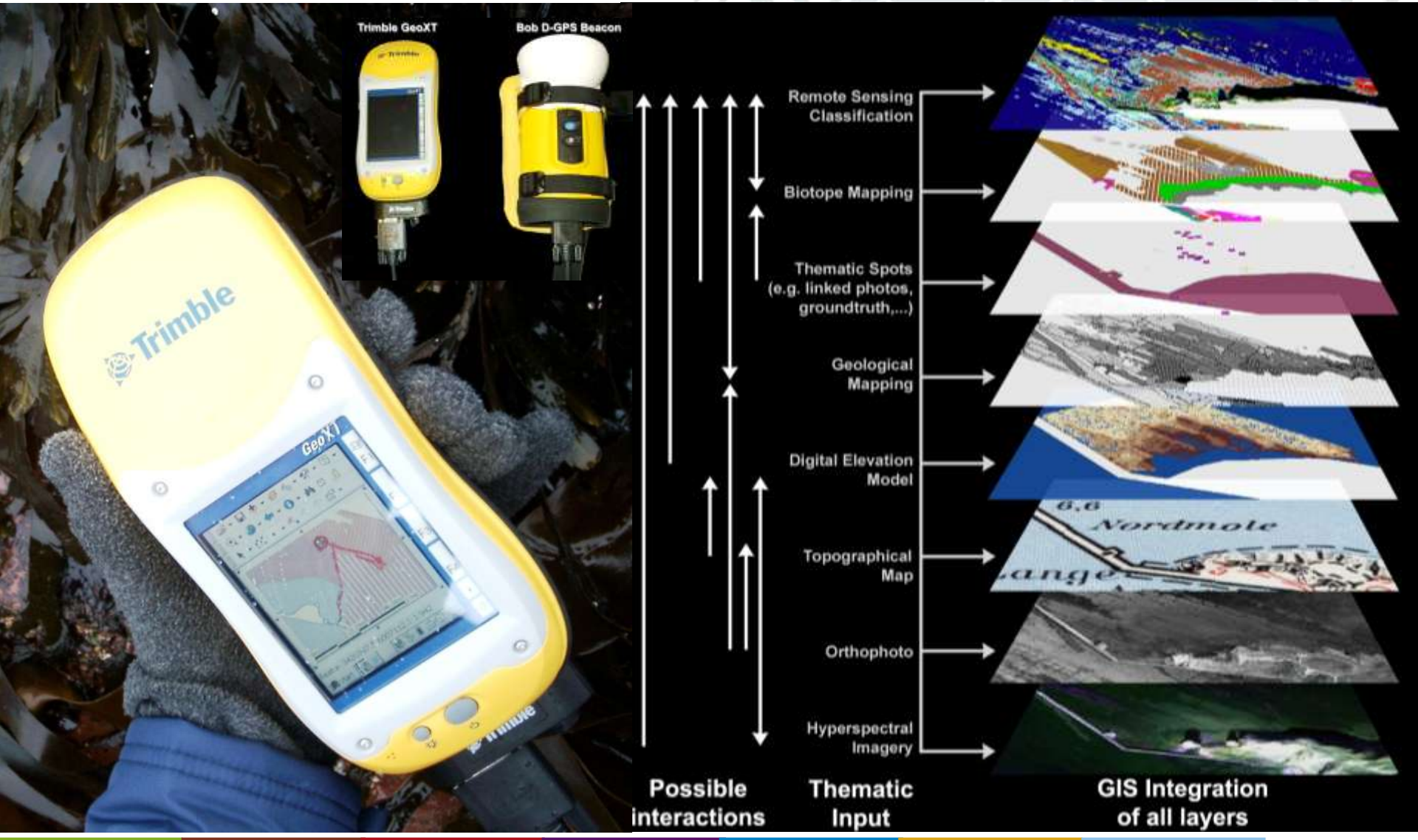
Location accuracy



Field work



Integrated GIS-RS-analysis approaches



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Thanks for your attention!