Extraction of digital surface & terrain model and tree height from national digital aerial photography

8TH ANNUAL SAVANNA SCIENCE NETWORKING MEETING

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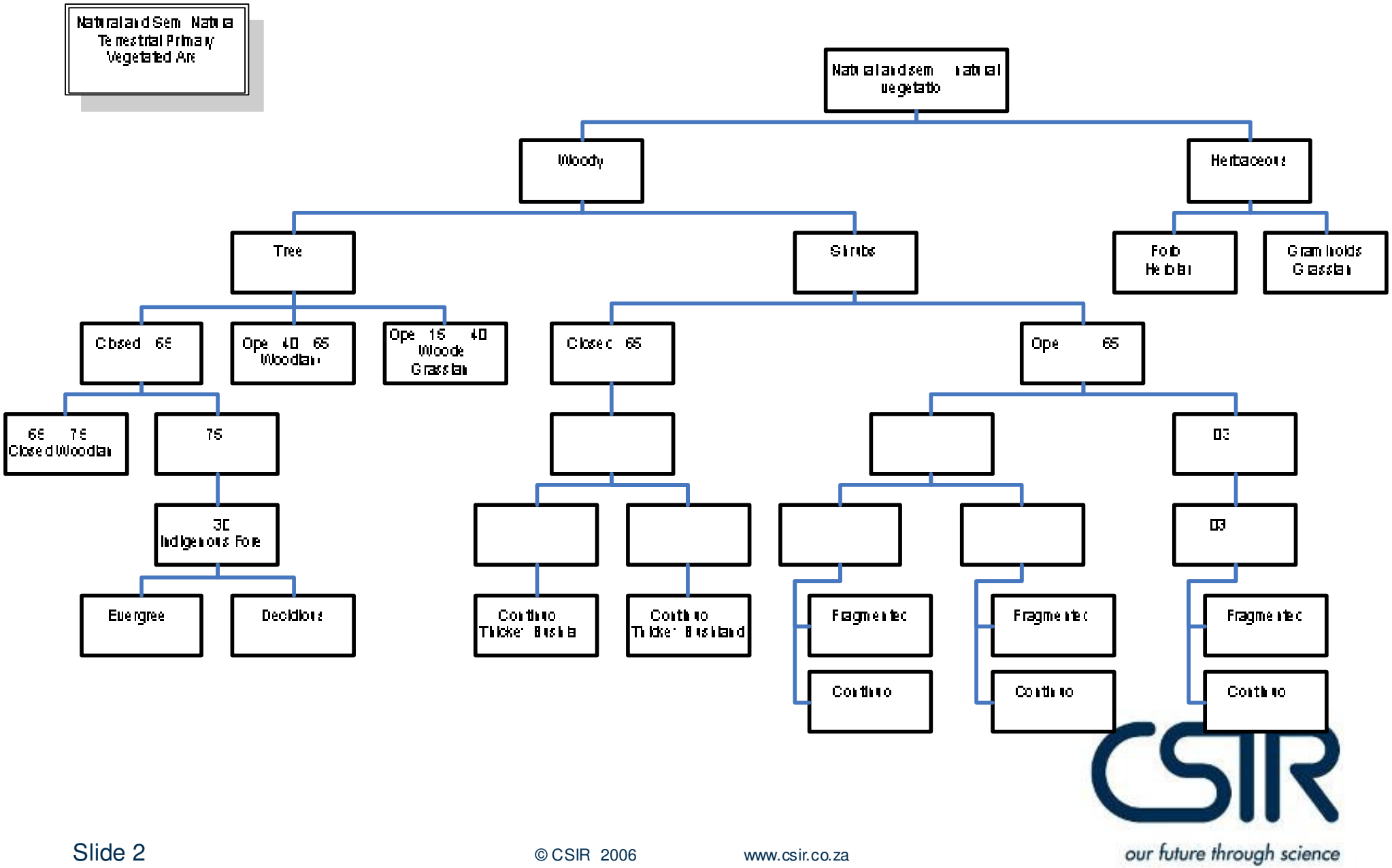
Natural and Semi-natural vegetation in the new land cover



Natural Vegetation Class Attributes

	CLASS / ATTRIBUTE	PRIMARY TYPE	INFORMATION SOURCE
1	**Natural and Semi-Natural terrestrial primary vegetated area**		
	woody cover		MODIS CSIR/MERAKA/NRE
	tree cover		MODIS CSIR/MERAKA/NRE
	dominant woody cover height		CSIR/SAC CDSM
	vegetation structure		TSX PALSAR CSIR/SAC
	graminoid cover		CSIR/MERAKA, NRE, ARC, DOA
	non-graminoid cover		CSIR/MERAKA, NRE, ARC, DOA
	vegetation cover		CSIR/MERAKA, NRE, ARC, DOA
	degree of alien infestation		ARC, DET, SANBI
	Disturbance rate		CSIR/SAC
	vegetation age		CSIR/SAC
	ecological presteeness		DEaT, SANBI
	vegmap classes		SANBI
	conservation rating		DEaT, SANBI
	type		

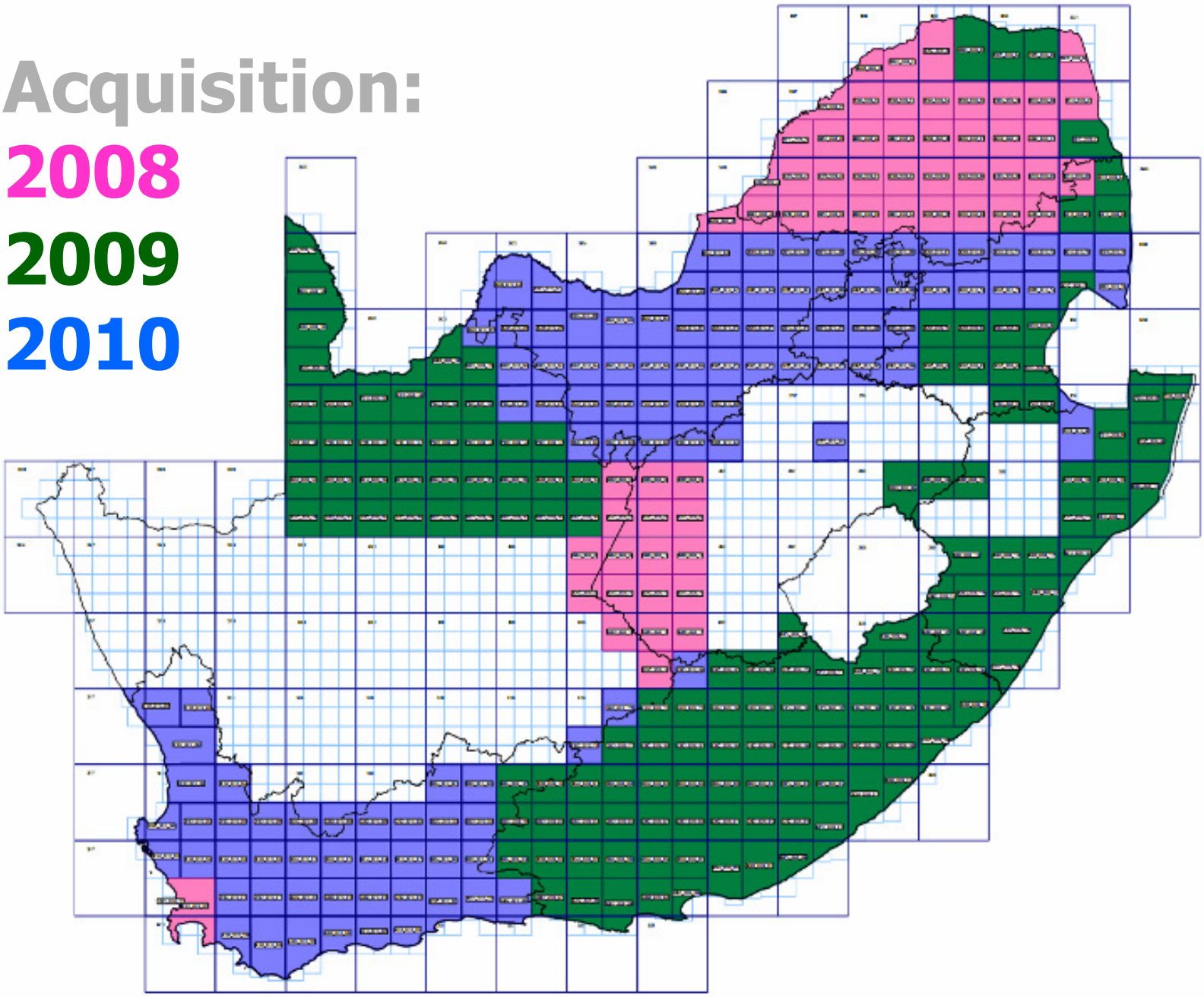
National RS source for Vegetation Structure

Acquisition:

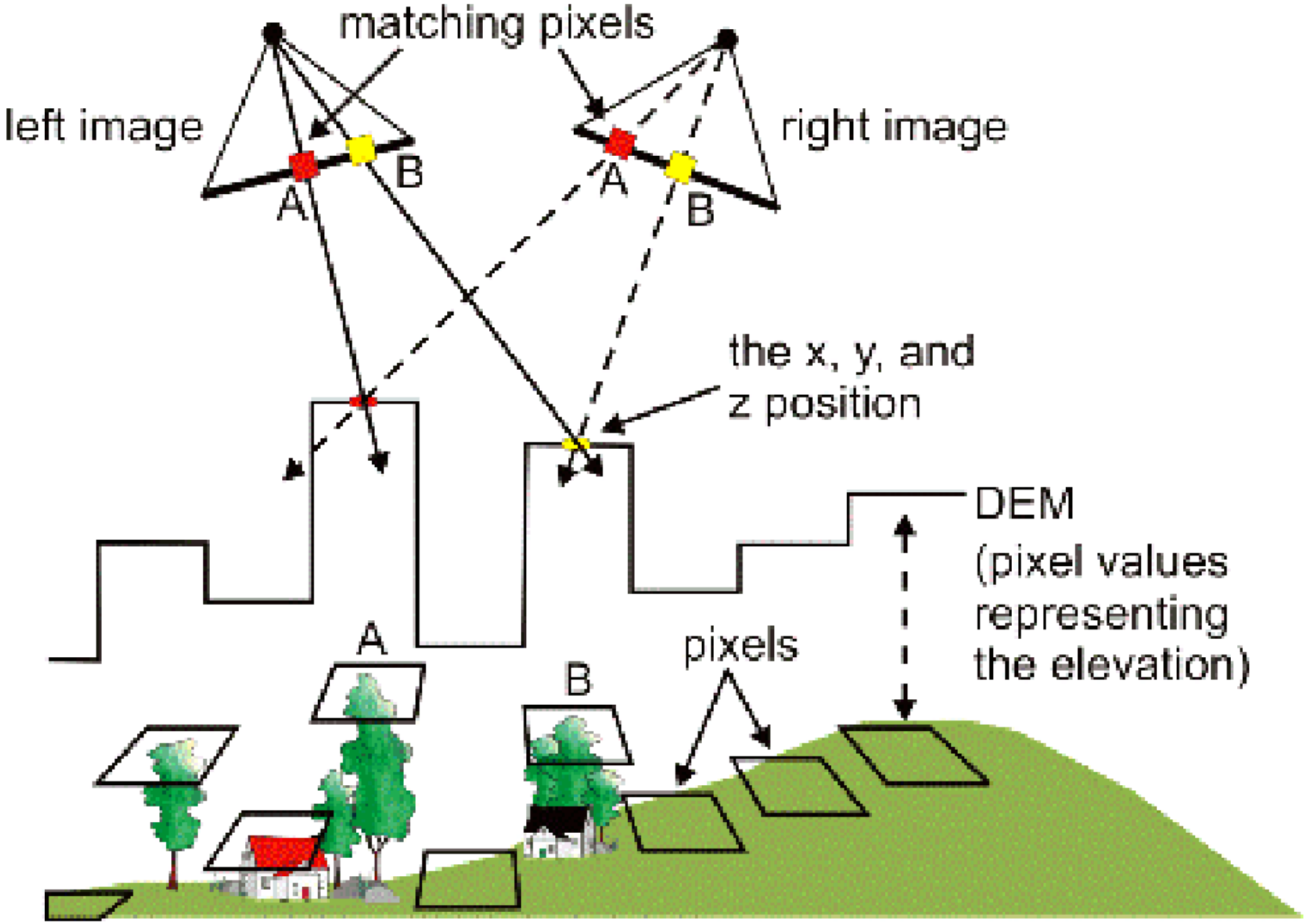
2008

2009

2010



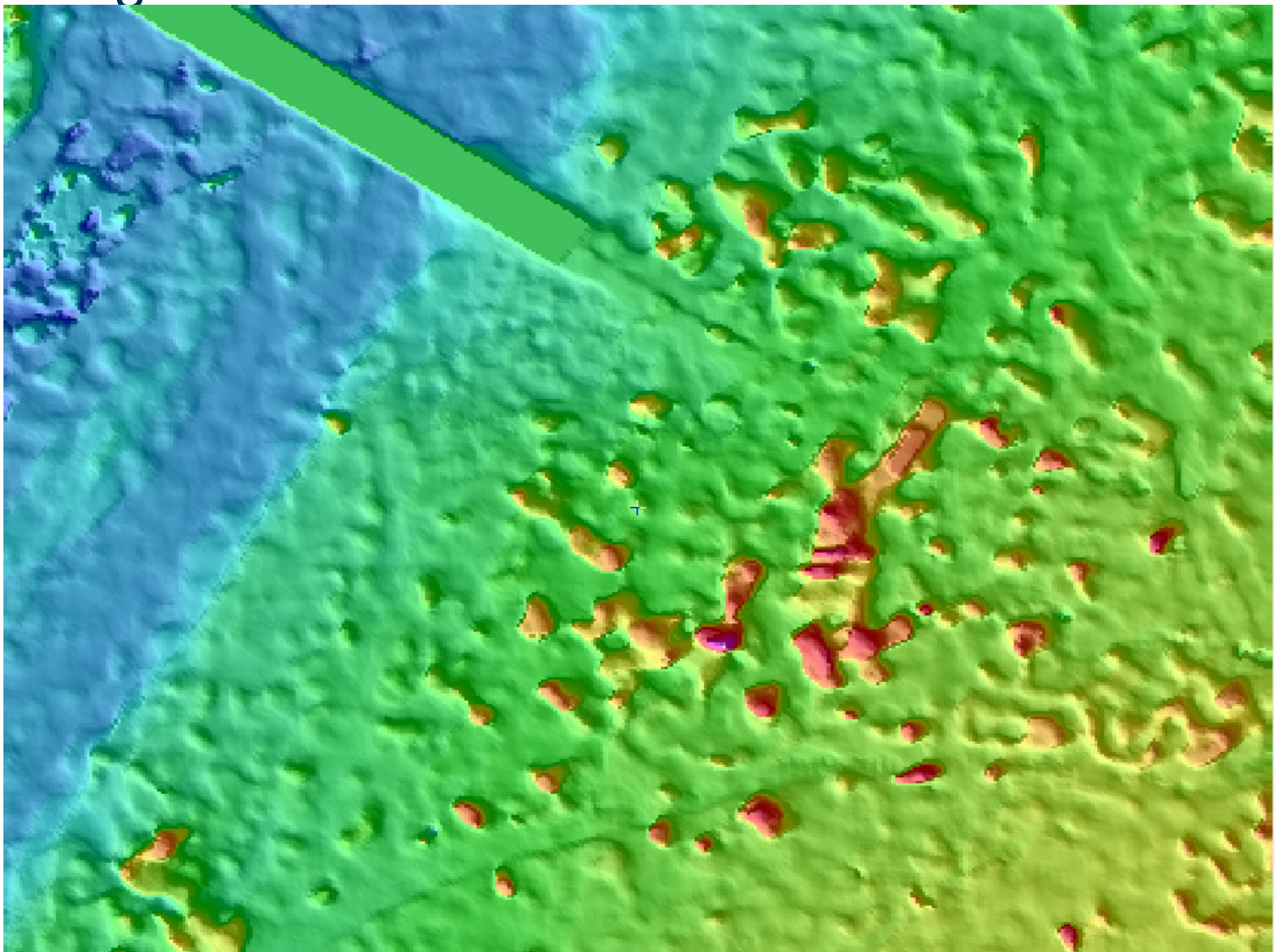
Stereo-pair surface model extraction



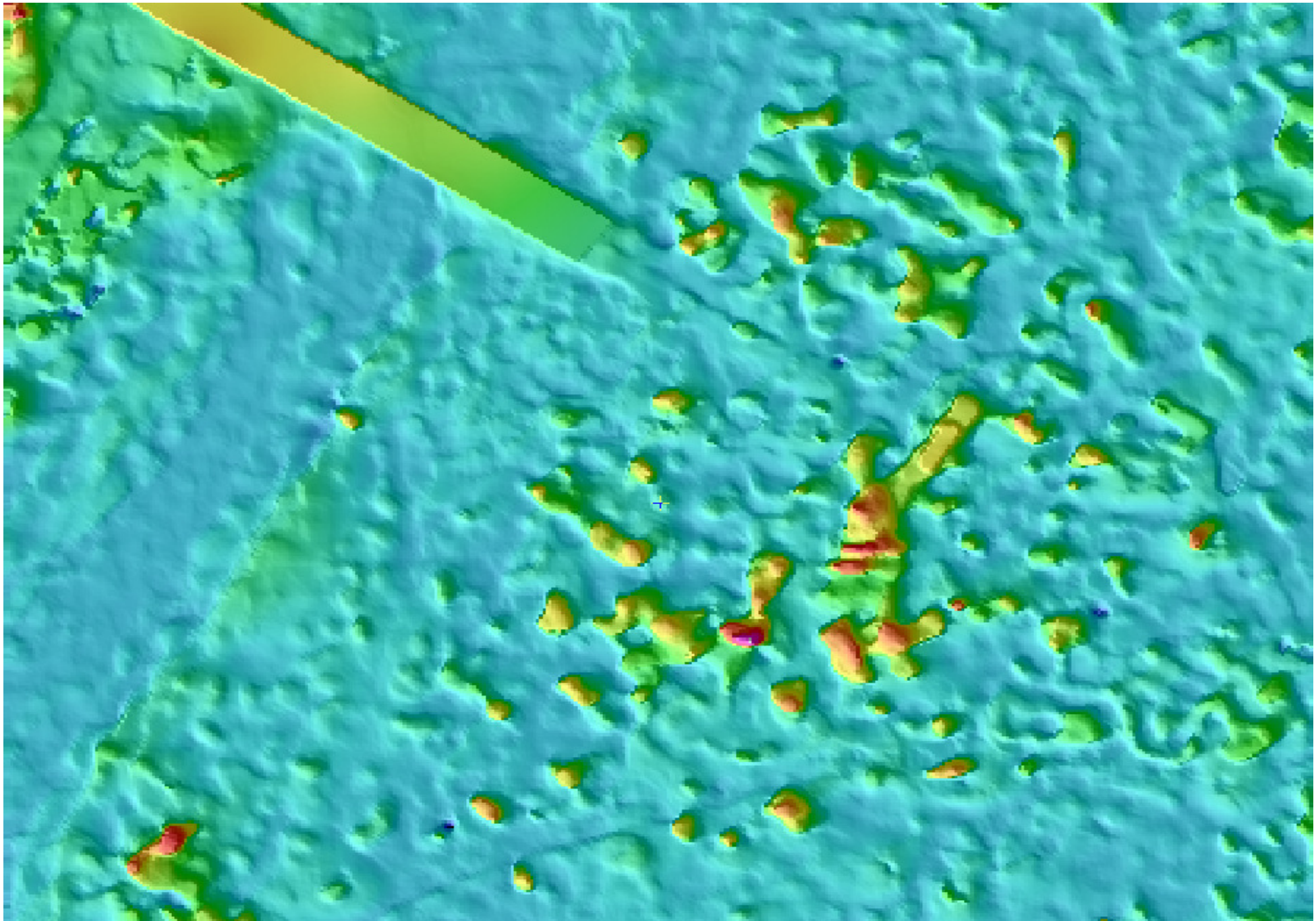
Processing steps entail:

- Image Triangulation
- Epi-polar Image transformation
- Surface Model (DSM) extraction
- Artefact removal
- Void filling
- Extraction of points on ground
- Interpolation of points to Digital Terrain Model (DTM)
- Subtraction of DTM from DSM
- Image and height model classification

Digital Surface Model



Digital Height Model



Challenges for National Product Generation

- Large data volumes (1400 MB for 1 12bit 4 band 0.5m image covering 3 km x 7 km)
- Poor reference data for automated GCP collection and triangulation.
- Intensive computation required for DSM extraction.
- Requirement of good DEMs for error identification in DSM.
- Selection of optimal void filling interpolation technique.
- Classification of surfaces on the ground by a multispectral image pre-classification using texture and spectral information.
- Discriminating lowest points in a dynamically adjusting moving window and low variance of smooth surfaces.
- Selection of optimal interpolation technique between objects on the ground.

THANK YOU!!!