Indonesian Peat Prize

International Peat Mapping Team (IPMT)

Presentation to the Public

02.02.2018 Pullman Hotel Jakarta (Indonesia)

Prof. Dr. Florian Siegert, Dr. Uwe Ballhorn, Peter Navratil, Prof. Dr. Hans Joosten, Dr. Muh Bambang Prayitno, Suroso, Felicitas von Poncet, Dr. Solichin Manuri, Dr. Bambang Setiadi

RSS Remote Sensing Solutions GmbH

AIRBUS DEFENCE & SPACE

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GREIFSWALD MIRE CENTRE

BPPT

International Peat Mapping Team

Prof Dr. Florian Siegert

- >20 years experience in RS and mapping of tropical peatlands
- Extensive knowledge in ecology
- Professor at Ludwig Maximilians University Munich (Germany) and CEO of RSS GmbH

RSS Remote Sensing Solutions GmbH

Dr. Uwe Ballhorn

- >10 years experience in RS and mapping of tropical peatlands
- PhD in mapping of tropical peatlands in Indonesia with RS
- Extensive experience in inventorying Indonesian peat swamp forests

RSS Remote Sensing Solutions GmbH

Prof Dr. Hans Joosten

- >30 years experience in peatland science all over the world
- Head of Global Peatland Studies University of Greifswald (Germany)
- Secretary-General of IMCG
- Lead author for IPCCC guidelines
- FAO senior advicer

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Dr. Bambang Setiadi

- >30 years experience in tropical peatland related research topics
- Chairman of National Research Council (NCR)
- Senior Tropical Peat Scientist at BPPT
- Expert for BRG (Badan Restorasi Gambut)

BPPT

RSS Remote Sensing Solutions GmbH

International Peat Mapping Team

Felicitas von Poncet

- Head of department for environmental monitoring applications using RADAR at Airbus DS Geo
- Strong background developing SAR based geo-information products

Dr. Muh Bambang Prayitno

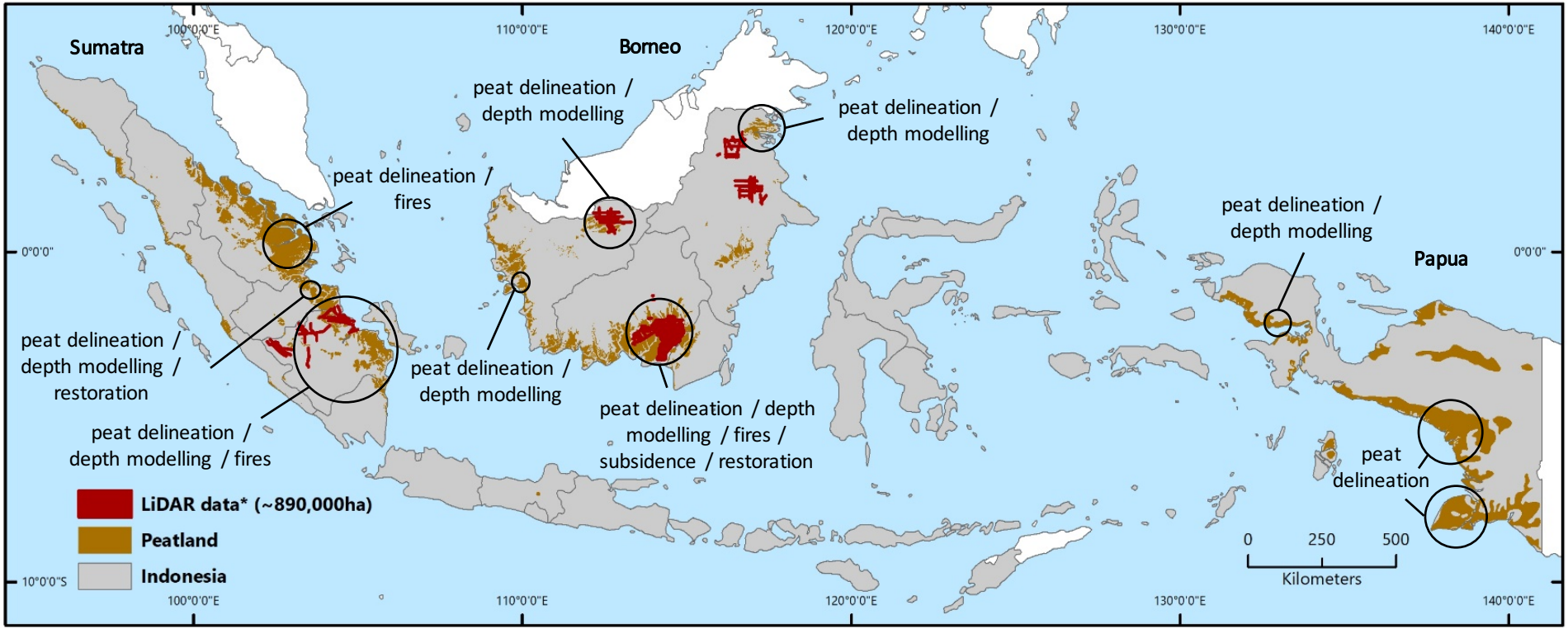
- >20 years experience inventorying peatlands in Indonesia
- PhD in peatland ecology
- researcher in peatland related issues at Sriwijaya University (Indonesia)

Dr. Solichin Manuri

- >10 years experience in using GIS and RS for monitoring fires and GHG from peatlands and forests in Indonesia
- PhD in biomass estimates of Indonesian peat swamp forests using RS

Peatland Mapping Projects in Indonesia

RSS GmbH has more than 20 years of experience in peatland mapping all over Indonesia



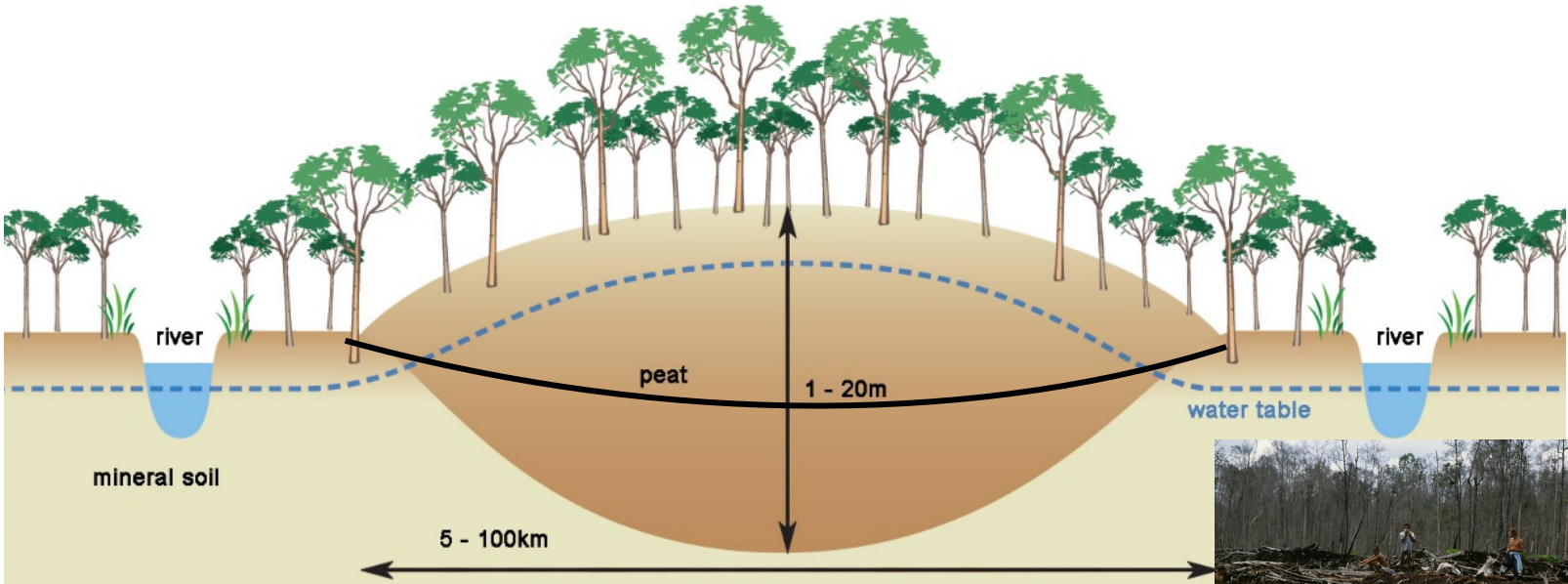
* From following projects: AusAID KFCP, GIZ FORCLIME, GIZ BIOCLIME, WWF Germany, OuTrop

TROPICAL PEAT AND NON TROPICAL PEAT

ISTOCK.COM/ RAMDAN_NAIN

Key features of peatlands in Indonesia

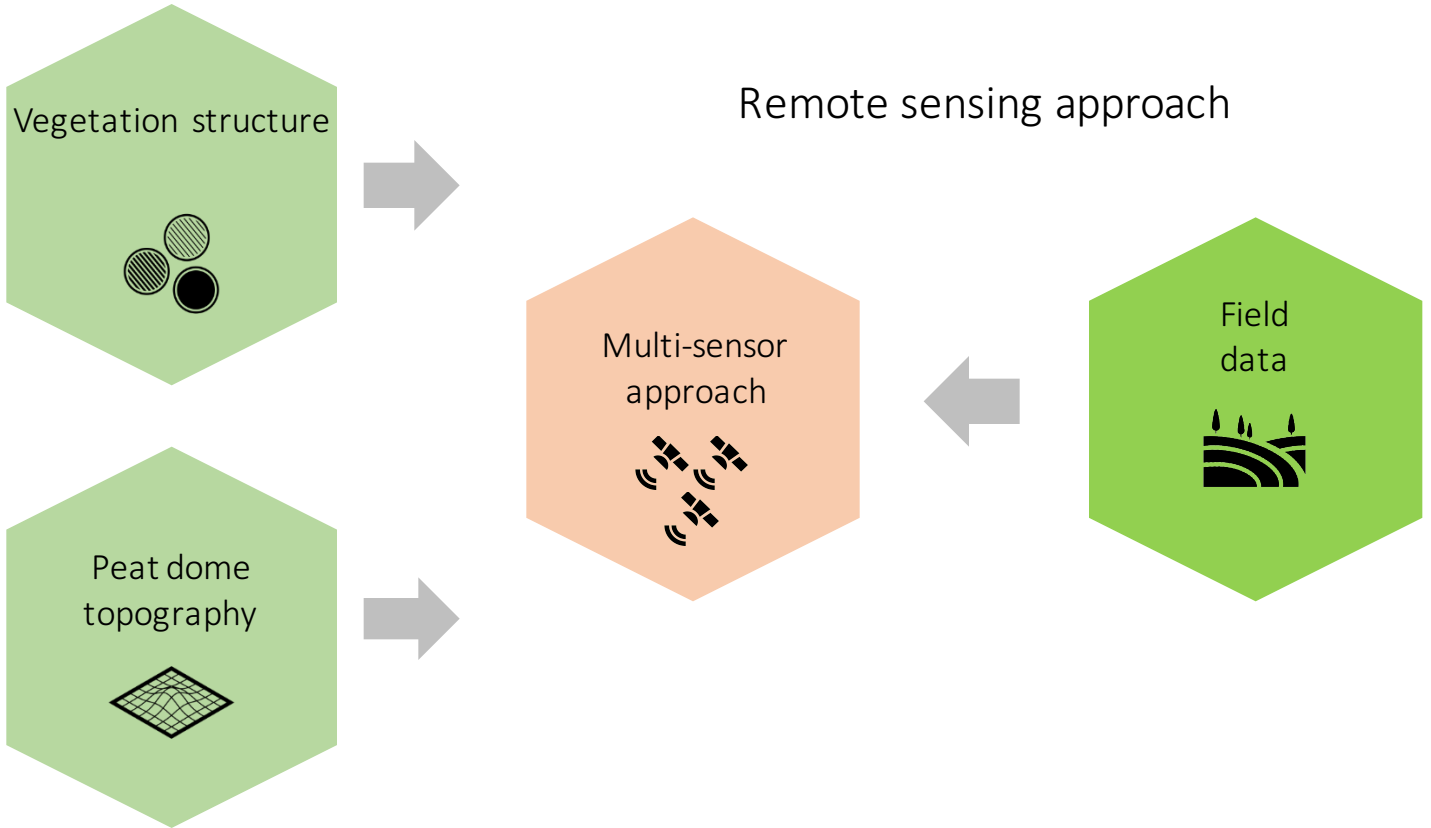
- Raised peat bogs often form pronounced domes
- almost all peatlands in Indonesia are covered by forest in it's natural stage



(adapted from WWF, 2016)

Underlying principles of the methodology

Key features of tropical peatlands



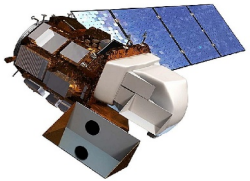
Multi-sensor approach

Vegetation structure

Peat topography

Peat topography

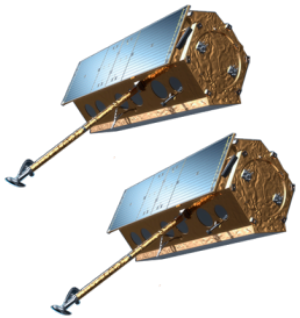
Historical Landsat



Recent Sentinel-2

Free of charge

TerraSAR-X TanDEM-X



WorldDEM DTM

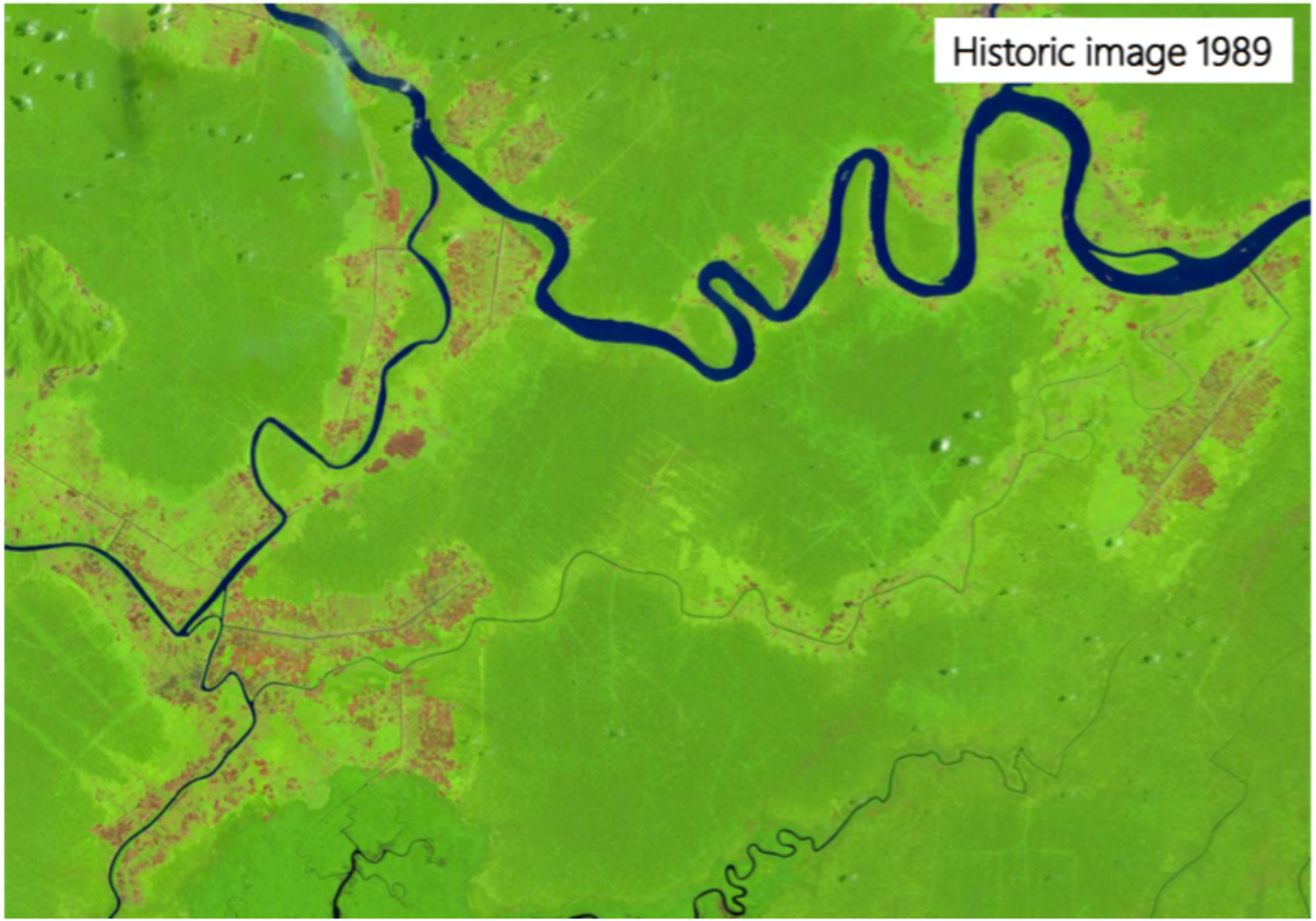
Aerial LIDAR & aerial photos

LiDAR transects

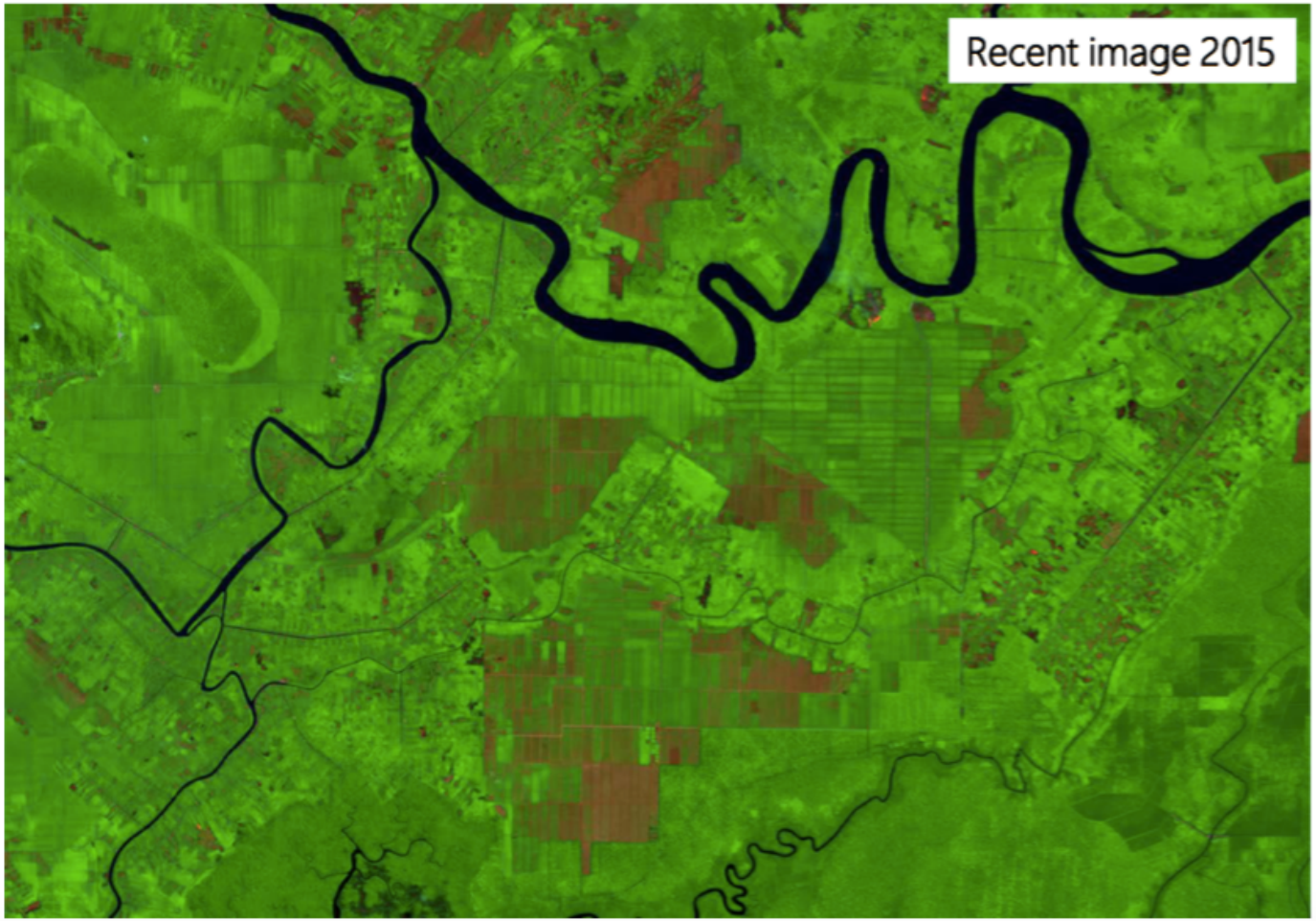
LiDAR full coverage

Increasing detail, accuracy & costs

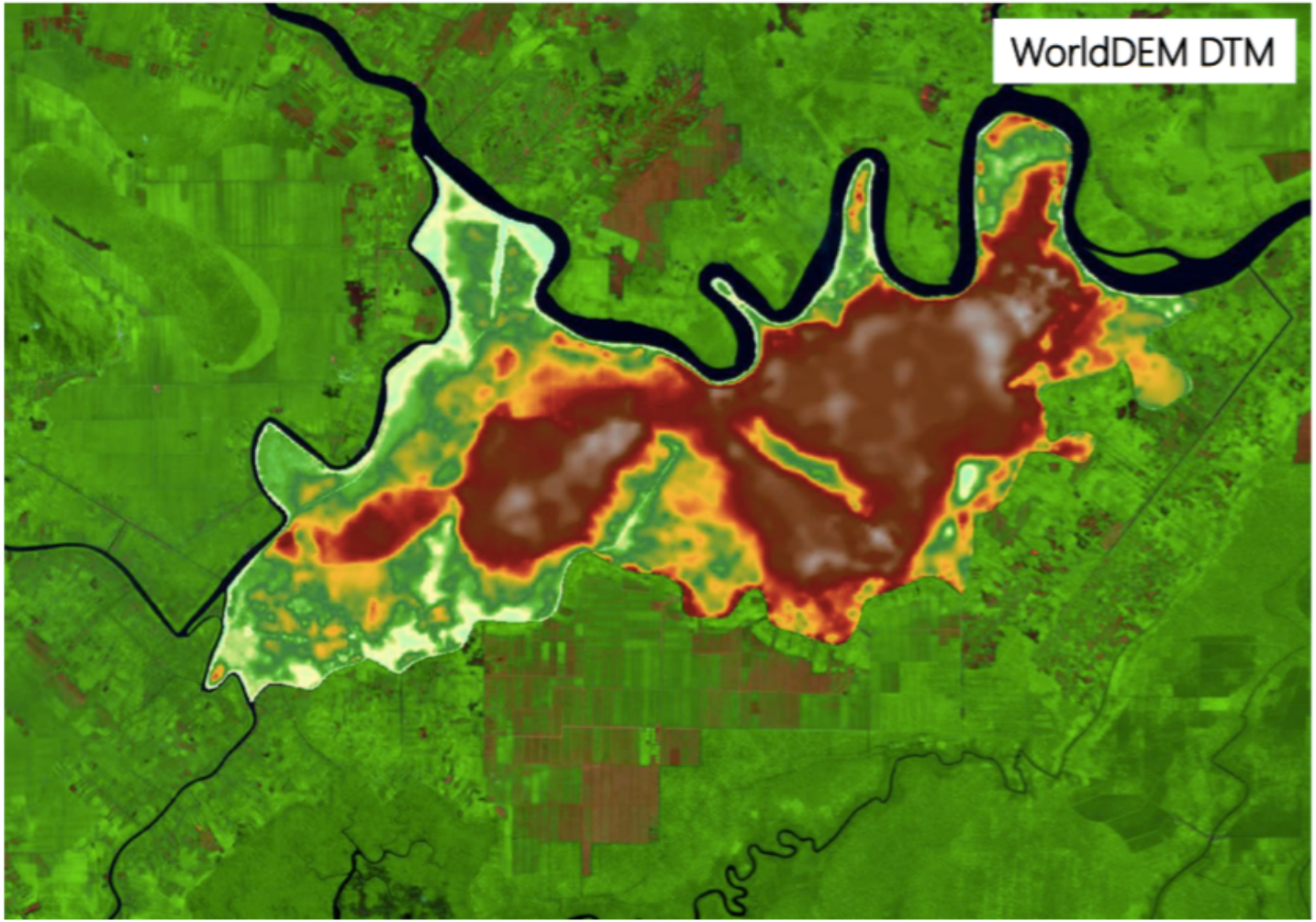
Final Test Site: peatland extent mapping



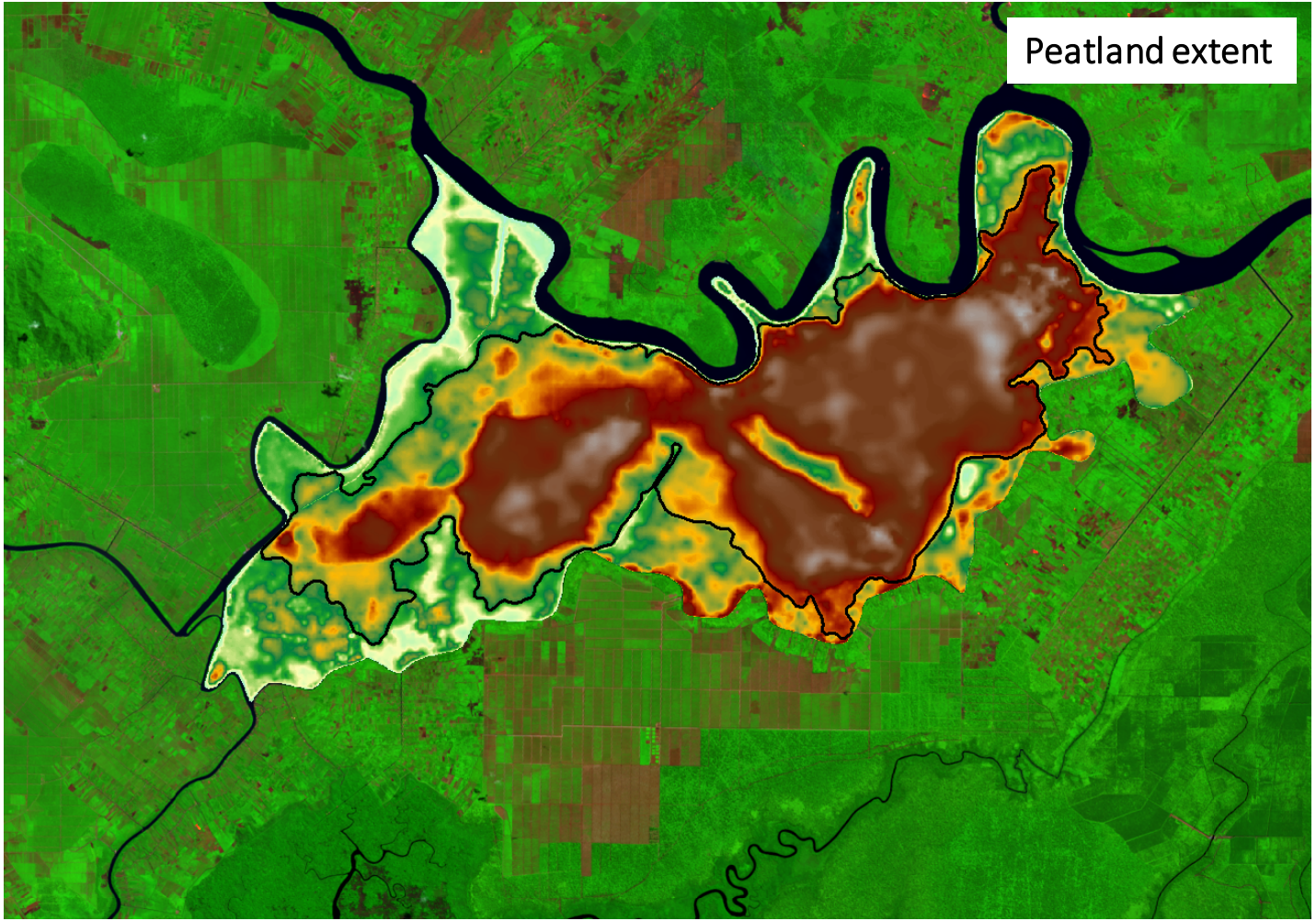
Final Test Site: peatland extent mapping



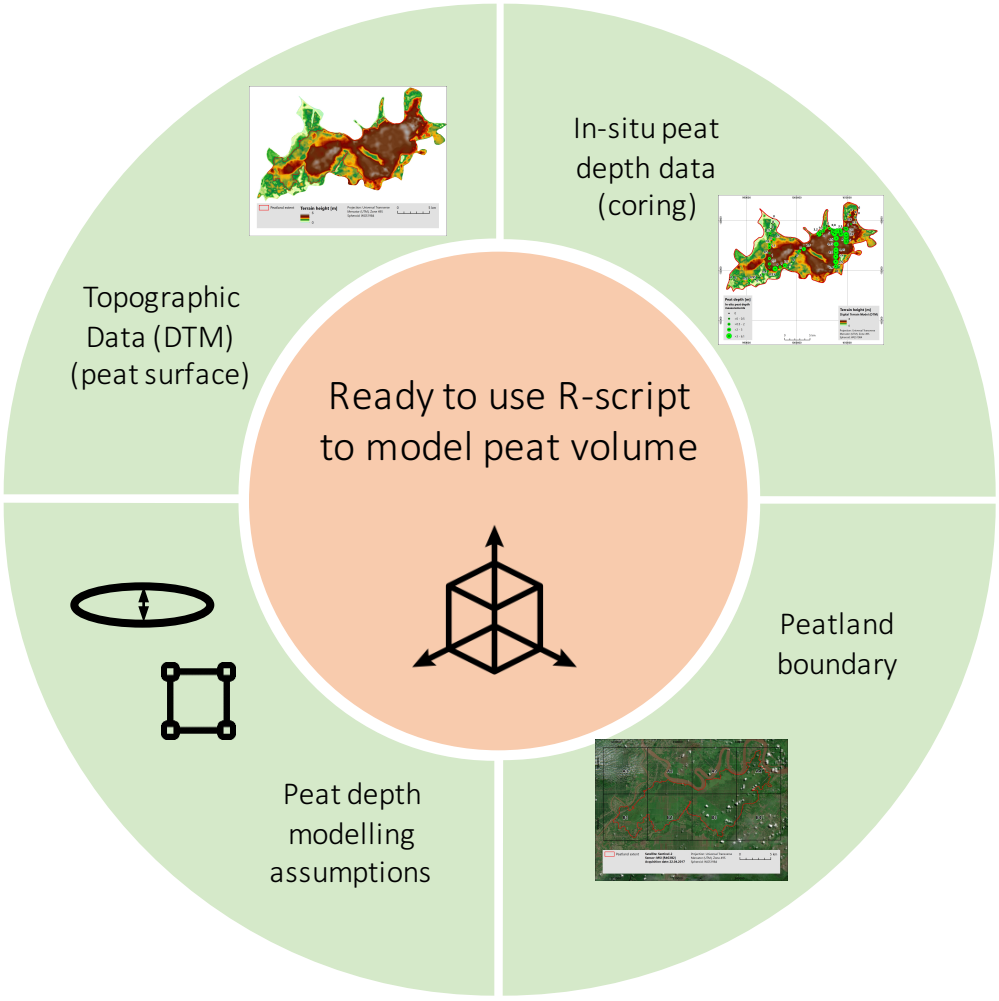
Final Test Site: peatland extent mapping

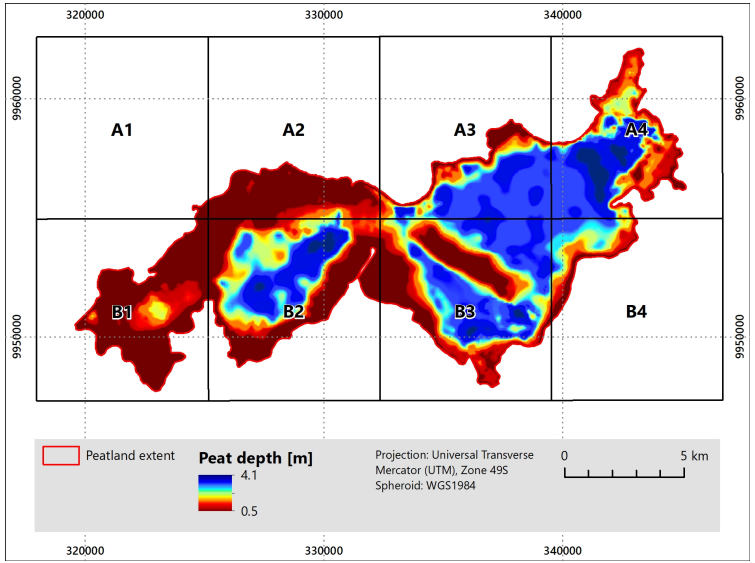


Final Test Site: peatland extent mapping



Test site 1: peat depth modelling





Recommended approaches

Level of detail, complexity and costs
Applied method depends on the desired detail/accuracy, budget and data availability

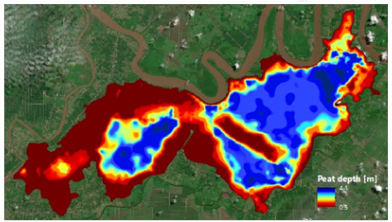
Input Data

	Low	Medium	High	Very high
Current land cover/use	Moderate resolution sat. imagery (e.g. Landsat)	High resolution sat. imagery (e.g. Sentinel-2)	Very high resolution sat. imagery (e.g. RapidEye)	Aerial photos
Topographic elevation data	SRTM/ ASTER GDEM	WorldDEM DTM	Airborne LiDAR transects	Airborne LiDAR full coverage
In-situ peat depth data	Conventional peat coring, Ground-penetrating RADAR (GPR) or Electrical Resistivity Imaging (ERI)			
Historical land cover/use		Historical multi-spectral satellite imagery (Landsat)		
Total costs (US$/ha)	0.38-1.23	0.42-1.26	0.65-1.61	3.78-5.67

Full area coverage

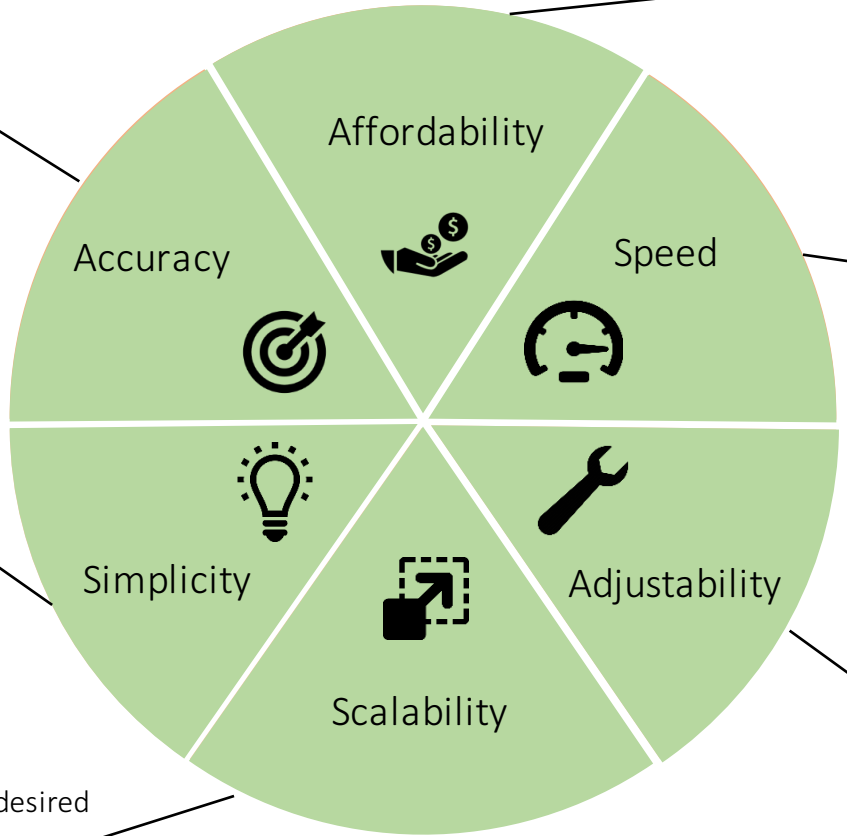
Transects

Peatland Mapping



Peatland delineation and peat depth modelling

Advantages of the methodology



- low costs
- open source software
- costs can be adjusted to budget (in-situ peat depth data collected)

- spatial resolution 12 meters
- minimum mapping unit 0.13 ha
- exceeds the required minimum mapping scale of 1:50,000

- quick (~0.23min/ha)
- ready to use scripts for automated processing

- mudah dimengerti
- tidak perlu ahli (pengeboran konvensional)
- Mendukung pengembangan kapasitas industri di dalam negeri

- variable approaches
- compatible with existing datasets
- able to incorporate future technologies

- can be fine tuned to the desired level of detail and accuracy

COST ESTIMATE

International Peat Mapping Team (IPMT)

1-phrase summary

"Peatland mapping and depth modeling using WorldDEM & airborne LiDAR surface topography and field measurements„

Cost estimate for final test site (using WorldDEM only)	
Accuracy (minimum mapping unit)	0,09 - 0,13 ha
Speed (ha/hour)	184
Cost ($/hour) *	$130,52

* most of the costs are data costs for WorldDEM (see table 11 of the report

Cost estimate for final test site (using WorldDEM & LiDAR transects)	
Accuracy (minimum mapping unit)	0,09 - 0,13 ha
Speed (ha/hour)	135
Cost ($/hour) *	$252,00

* most of the costs are data costs (see table 11 of the report). Costs for LiDAR are exceptionally high in this case because the test site is small -> high mobilization costs)

General cost estimate (using WorldDEM)	
Accuracy (minimum mapping unit)	0,09 - 0,13 ha
Speed (ha/hour)	150 - 200 ha
Cost ($/hour) *	120 -160 US$

* most of the costs are data. Costs for LiDAR can be significantly reduced if the survey area exceeds 1 Mio ha.

TERIMA KASIH