

K&C Phase 3 – Brief project essentials

Land Cover and Landcover change Mapping of Sulawesi Using Alos Palsar

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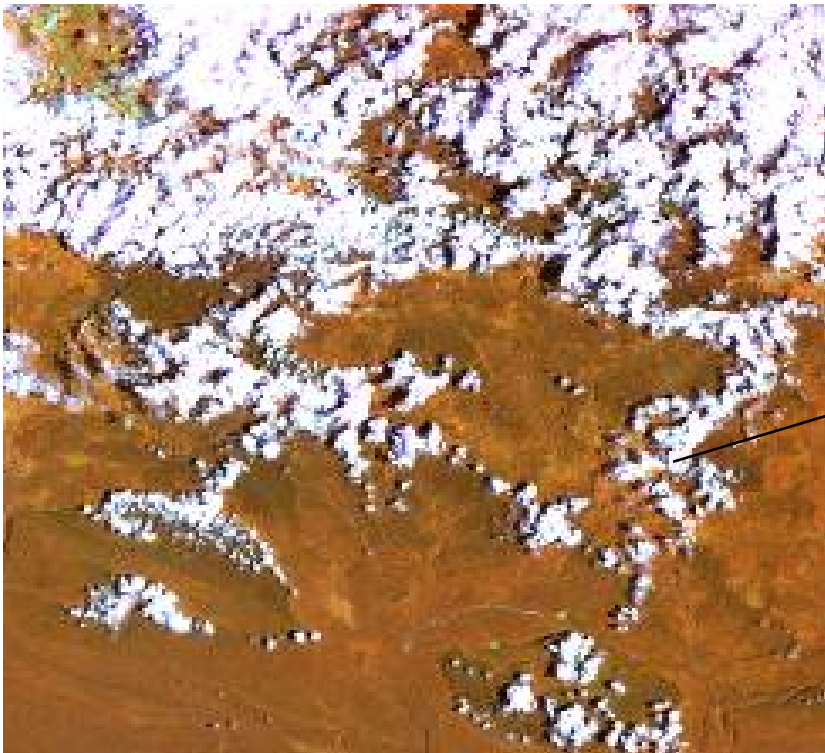
*National Coordinating Agency for Surveys and Mapping
(Bakosurtanal)*

Science Team meeting #19 – Phase 3 Kick-off
JAXA TKSC/RESTEC HQ, Tsukuba/Tokyo, April 9-12 2013

The Radar is the Challenge for Landcover mapping

by JAXA

- K&C phase 3 is the Challenge for collaborative program on land and forest cover monitoring in Tropical rain forest area like in Indonesia.
- Due to geographic al position of Indonesia the application of optical remote sensing for land cover mapping is hampering by cloud cover.
- The availability of ALOS which carries three on-board sensors including the Phased Array type L-band Synthetic Aperture Radar (PALSAR) is the challenge to aim at day-and-night and all-weather observation for landcover mapping.



Objective of the Project

1. To demonstrate the ability of ALOS PALSAR for land cover (2012-2013) and landcover change mapping (2013-2014) of Sulawesi Island

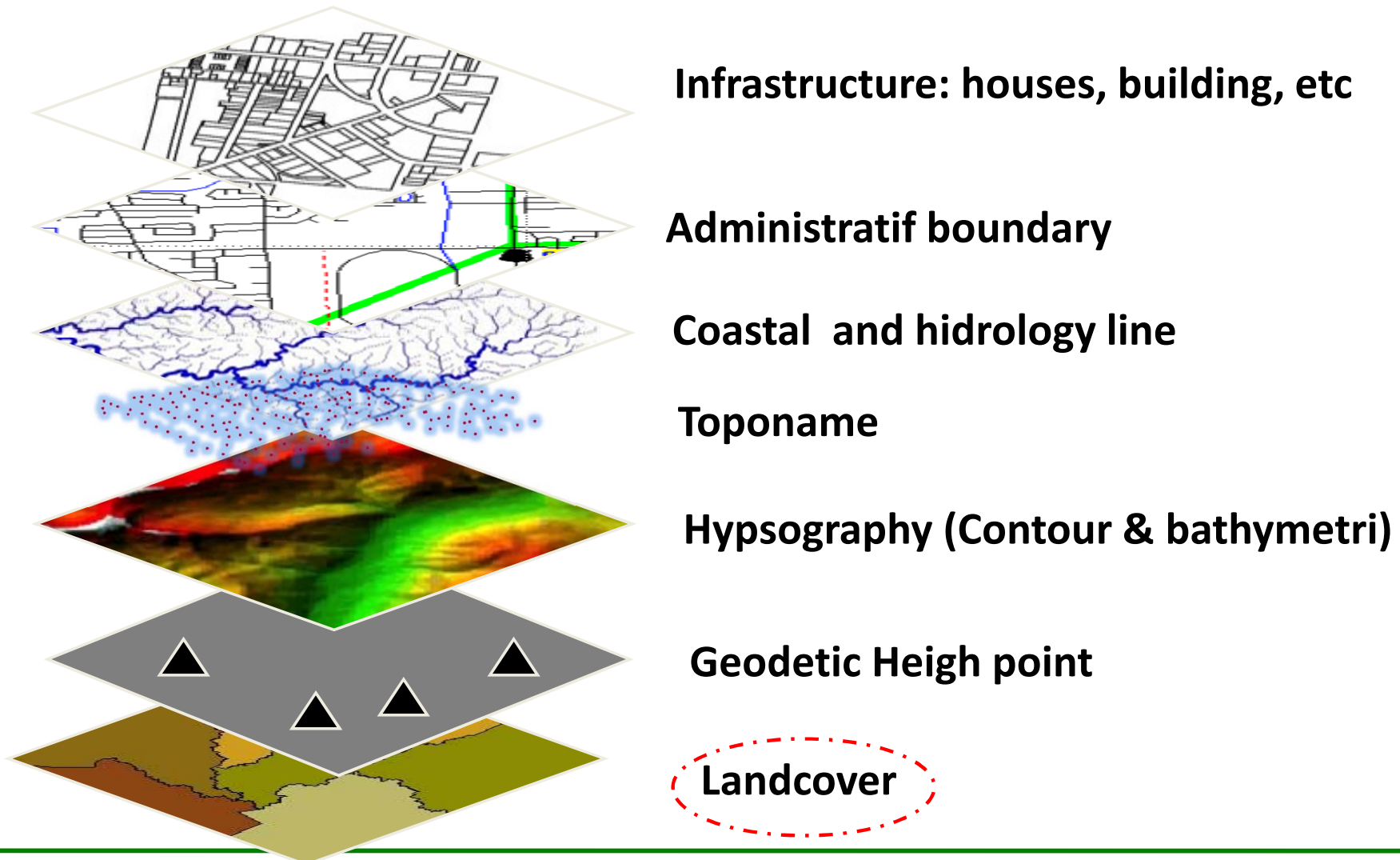
Support to JAXA's Global Forest Mapping effort

- The Japan Aerospace Exploration Agency (JAXA) has generated maps of the global forest and non-forest area distribution (in 2007 and 2009) using 10-meter resolution images of PALSAR (Phased Array type L-band Synthetic Aperture Radar)
- Ground truth data and landcover map are deliverable to give input for revision on forest and non forest distribution in this region.

Project Support for Environment Protection

- The availability and accesibility of landcover data are useful to support national and international conservation in Indonesia.
- Landcover data has been used to suport presidential decree no 10/2011 about moratorium activities in primary forest and peat land. This moratorium aim to reduce emission from forest and peat land.
- Understanding of Carbon cycle and biomas extracted from landcover is also posible. This aproach is the simple step to support the Indonesian gov policy in REDD and Climate change action.

- Land cover map became one of topographic map layer → the availability of landcover is mandate of GOI Law no 4/2012 about Geospasial Information



Project Deliverable

1. Progress report of the methodology for land cover mapping and land cover change
2. Map product of Sulawesi island consist of:
 - land cover map → end 2012 or March 2013
 - landcover change map → end of 2013
 - Ground truth data for Sulawesi

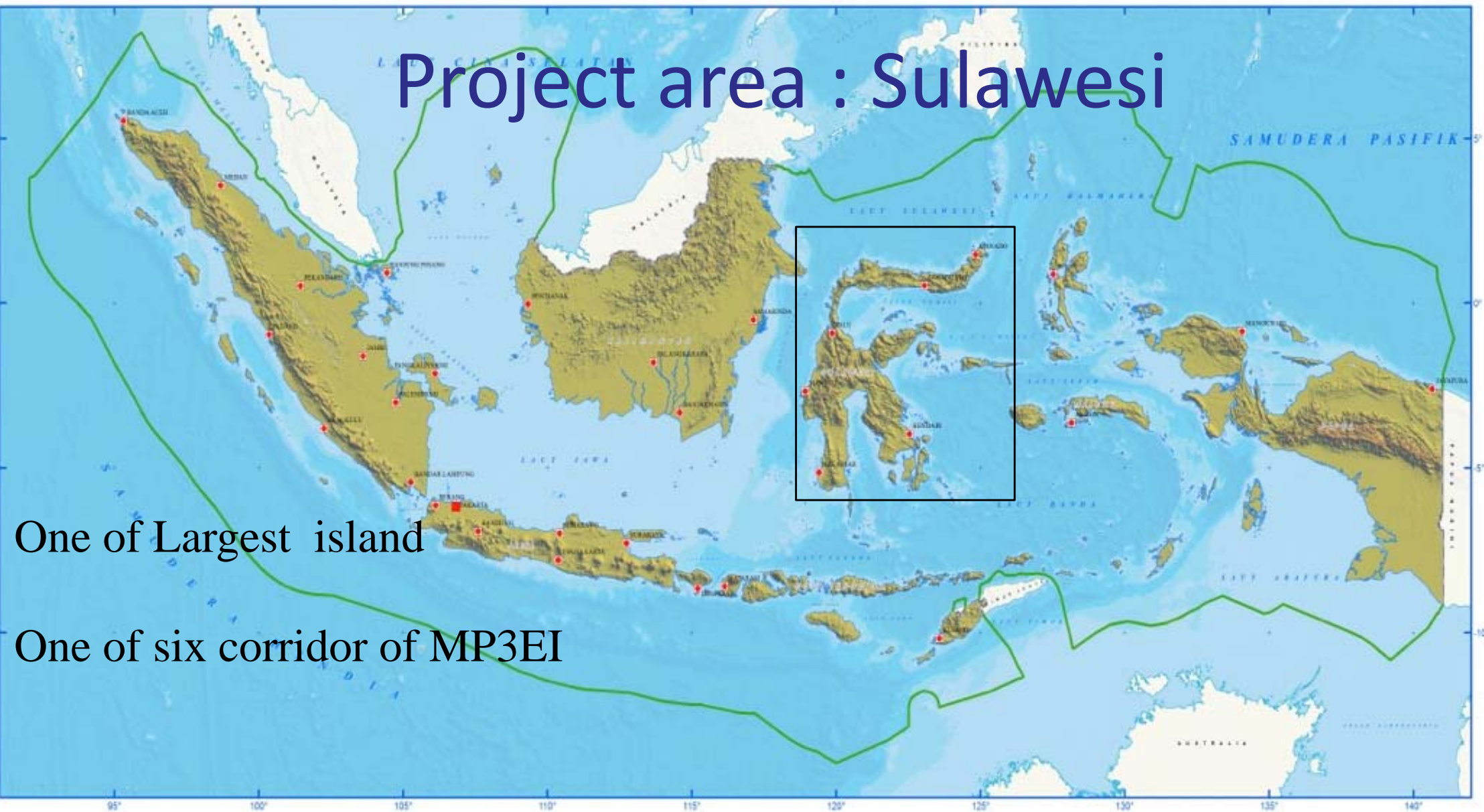
ALOS

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Project area : Sulawesi

One of Largest island

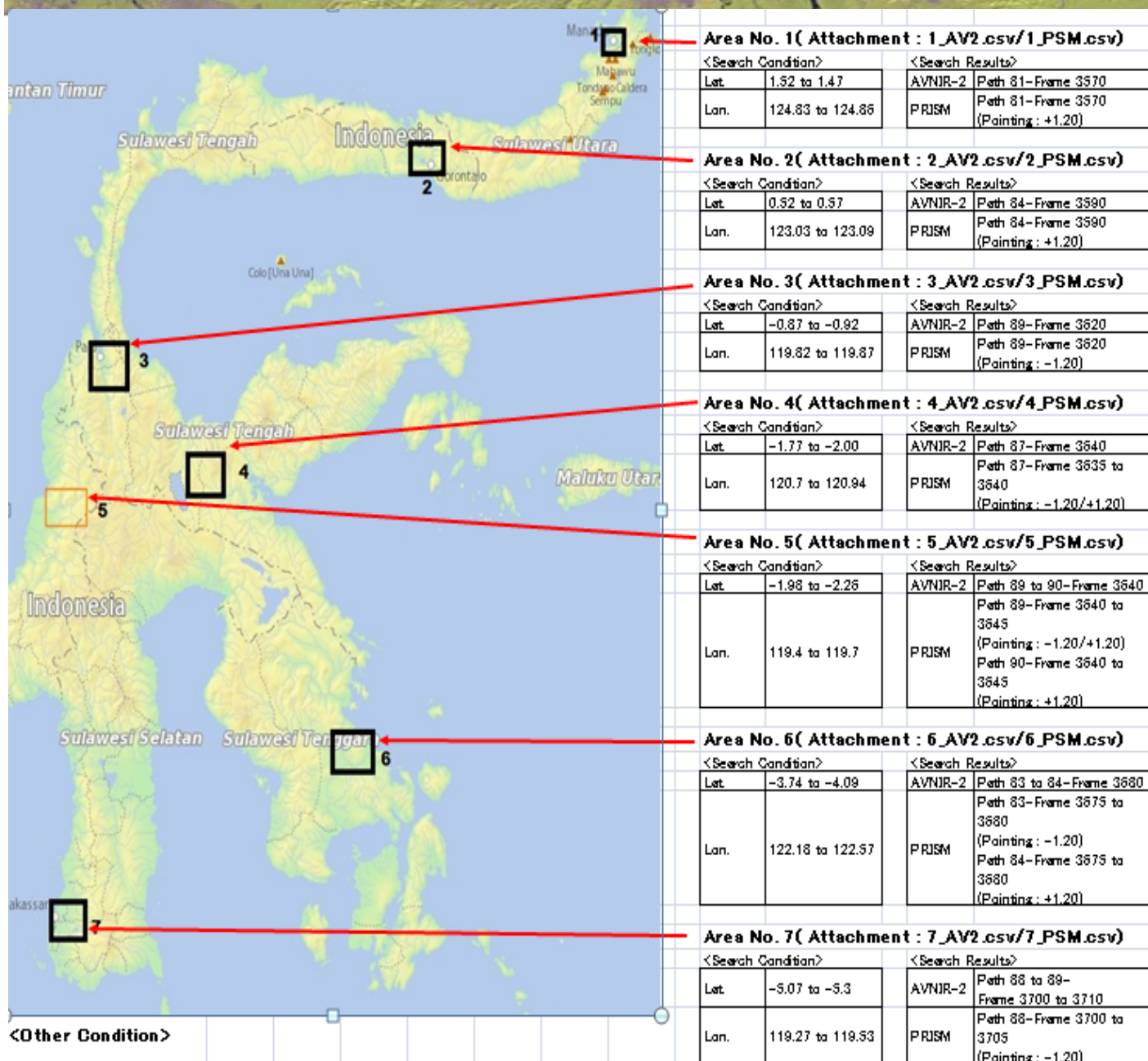
One of six corridor of MP3EI



| Data type | Status data | Progress work | Plan |
|--|--------------------------------|--|---|
| ALOS PALSAR Mosaic 25 M (2007, 2008, 2009, 2010) | Data recieved on February 2013 | Processing for segmentation and classification | To finish clasiification for island |
| Jers -1 SAR mosaic at 25 m (mid 1990s) | In prepare for request | Will use for change detection | landcover change analysis is in schedule |
| ALOS PALSAR (HH) mosaic 100 m | In prepare for request | | |
| AVINIR, PRIMS and PALSAR FBD | 50 data downloaded | Disply and identification to support visual interpretation and ground truth data | Interpretation for atributing segmentation image for classification |
| Landsat Data | Available and downloaded | Were manually Interpreted for landcover 2008, 2010, 2011 | - |
| Topomap | available | | |

Progress work : Alos data Aquisition

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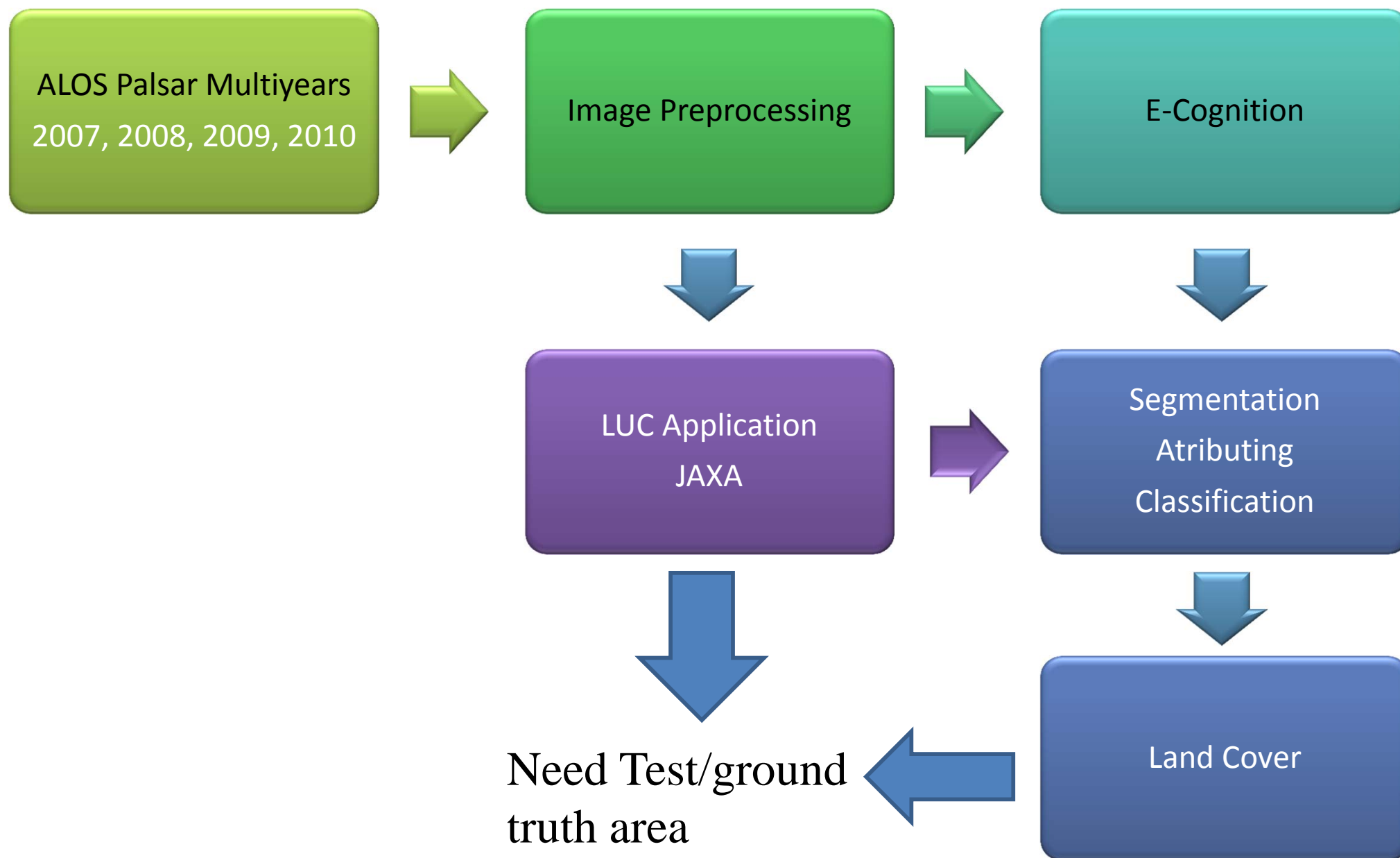


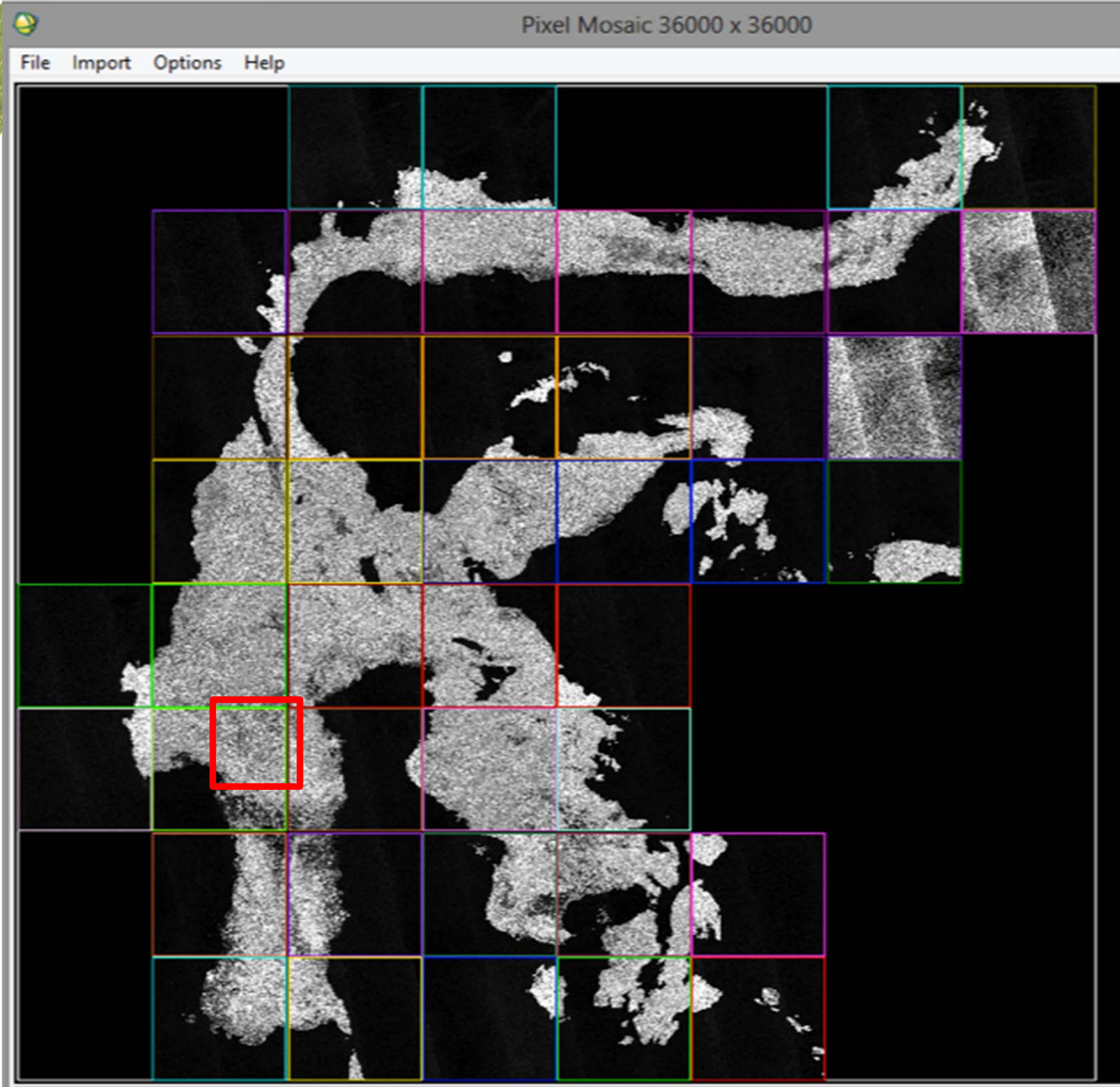
ALOS DATA
PRIMS AND
AVINIR FOR
GROUND
TRUTH

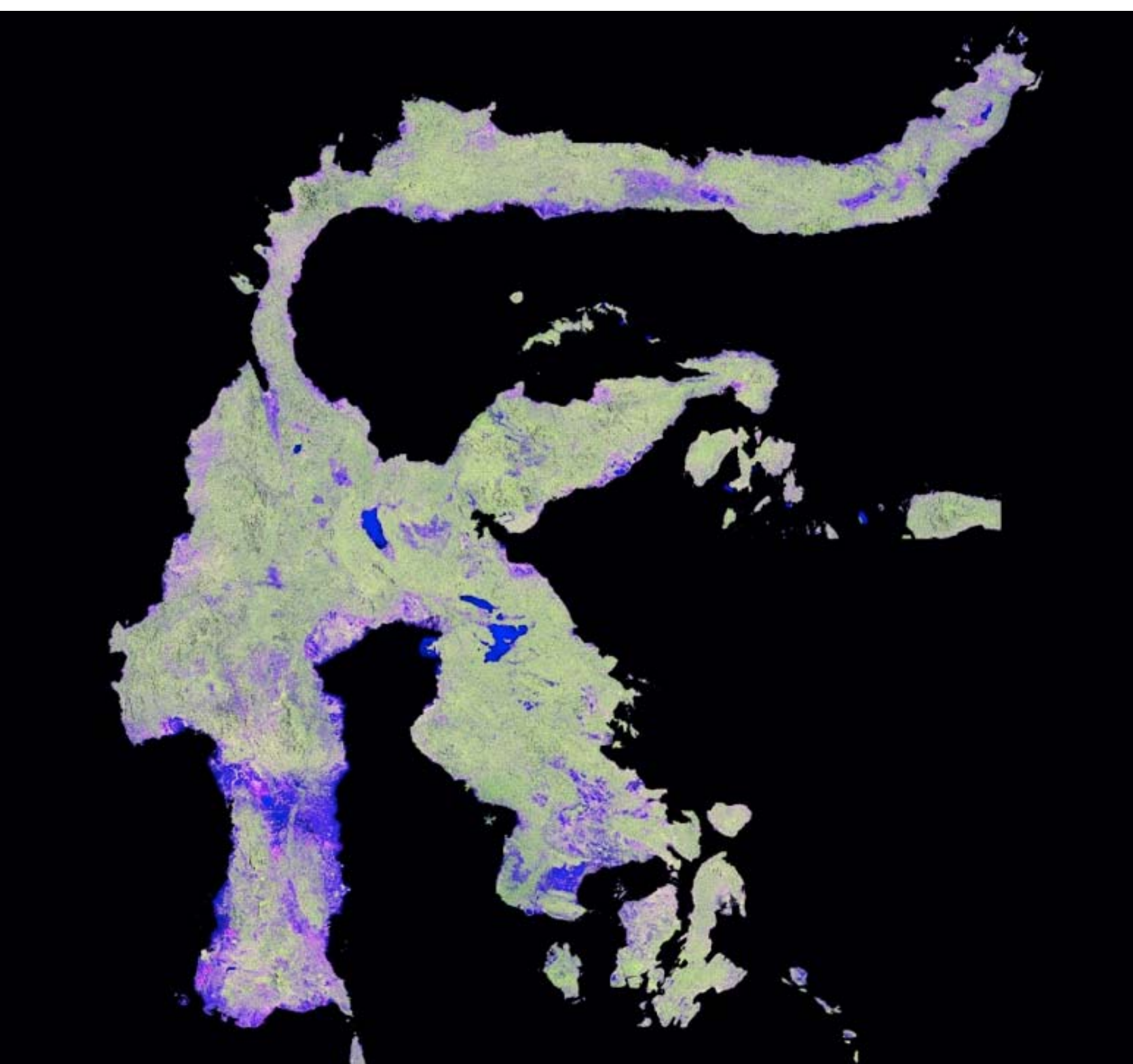
ALOS

Land Cover Classification

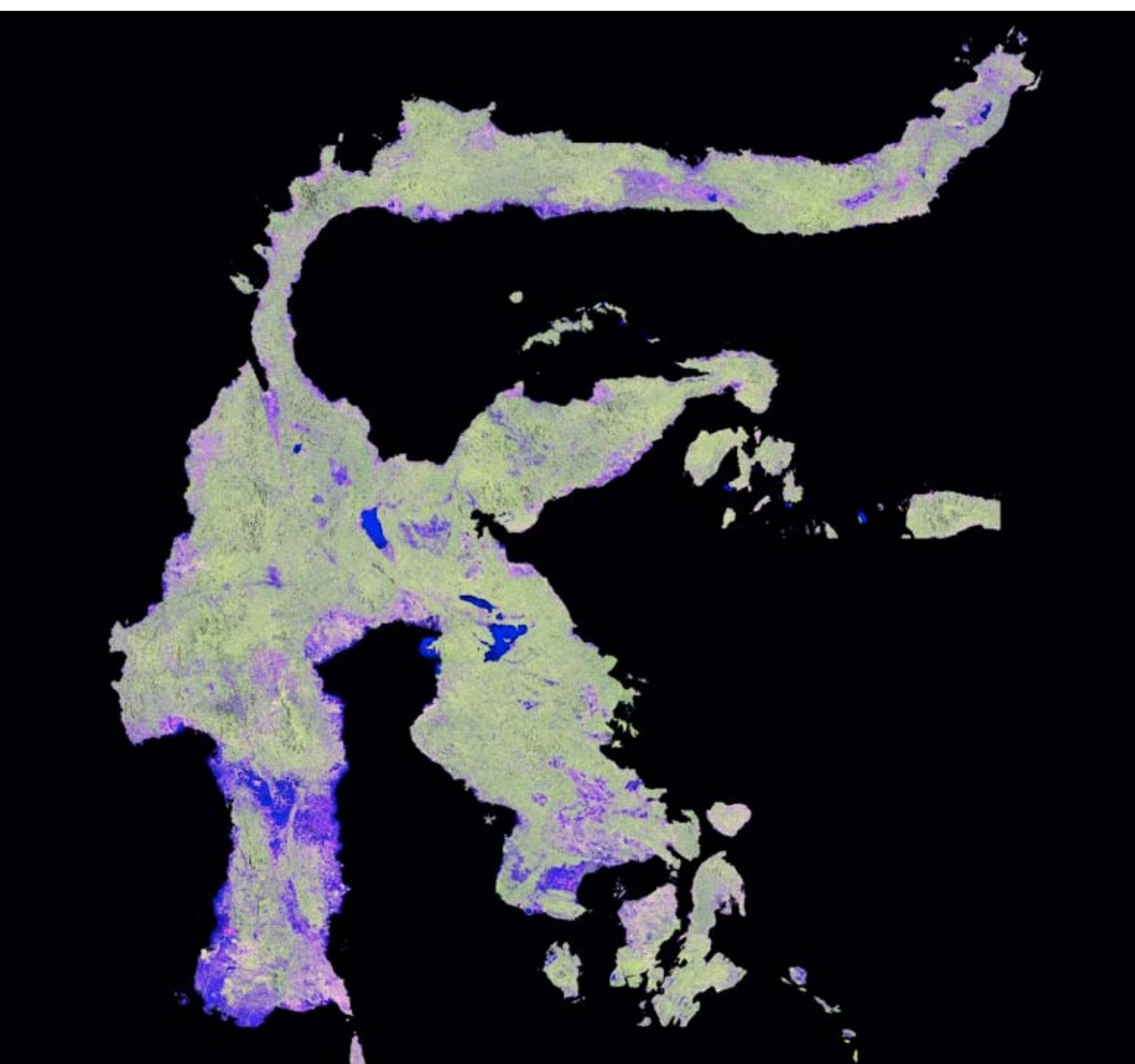
ISRIC Initiative
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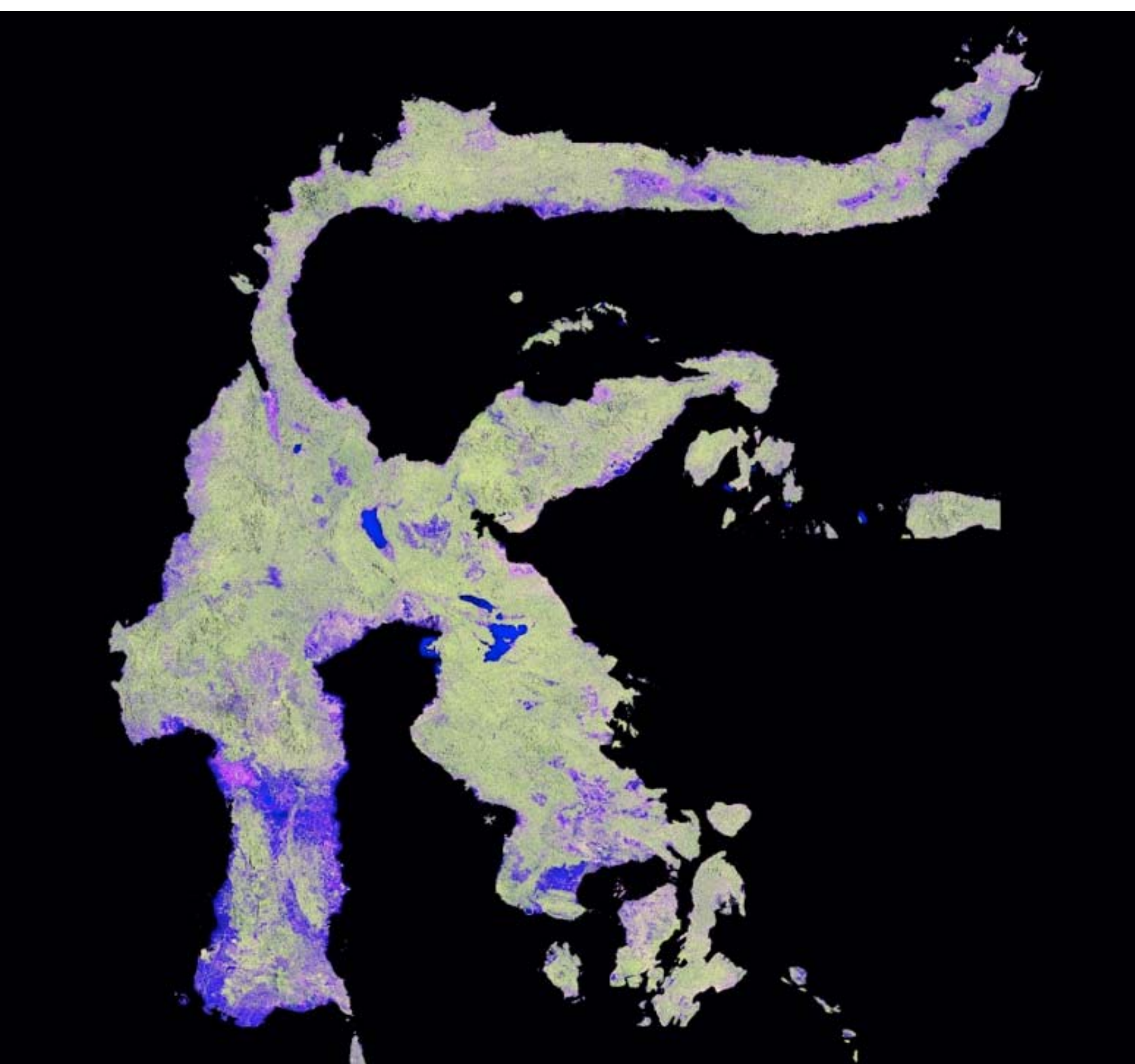




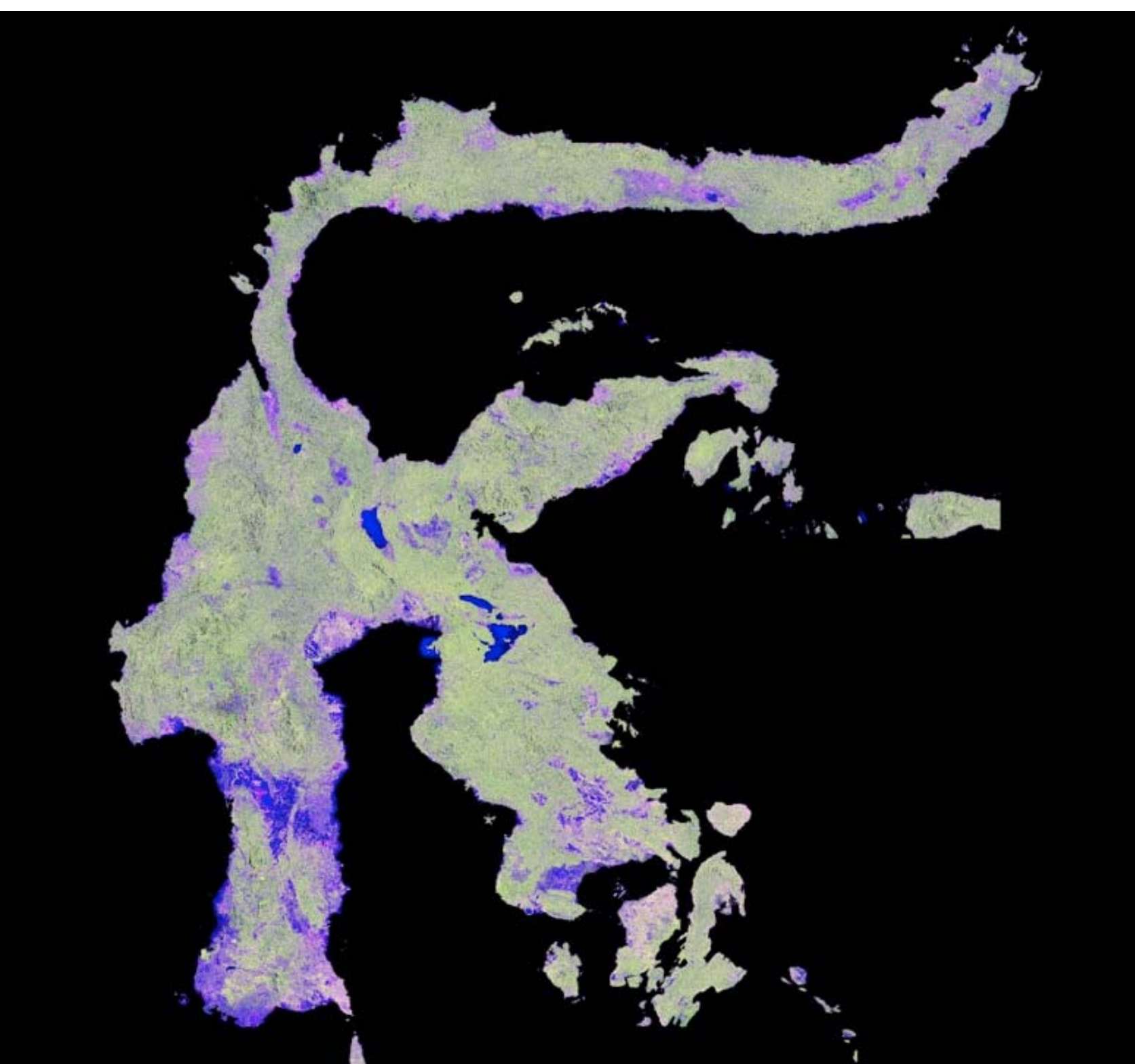
Initiative
2007
ce collaboration led by JAXA



Initiative
2008
ce collaboration led by JAXA

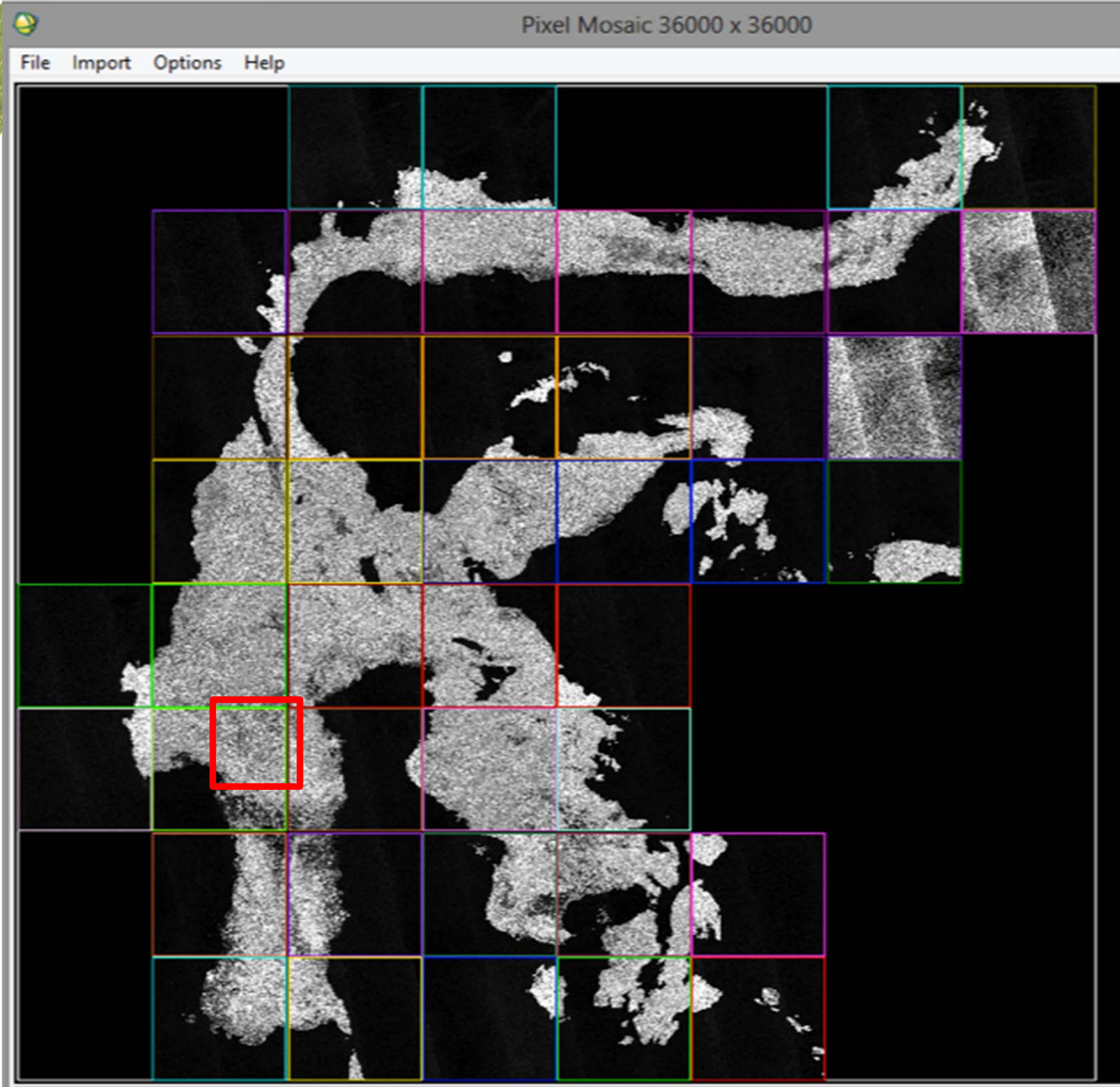


Initiative
2009
ce collaboration led by JAXA



Initiative
2010
ce collaboration led by JAXA

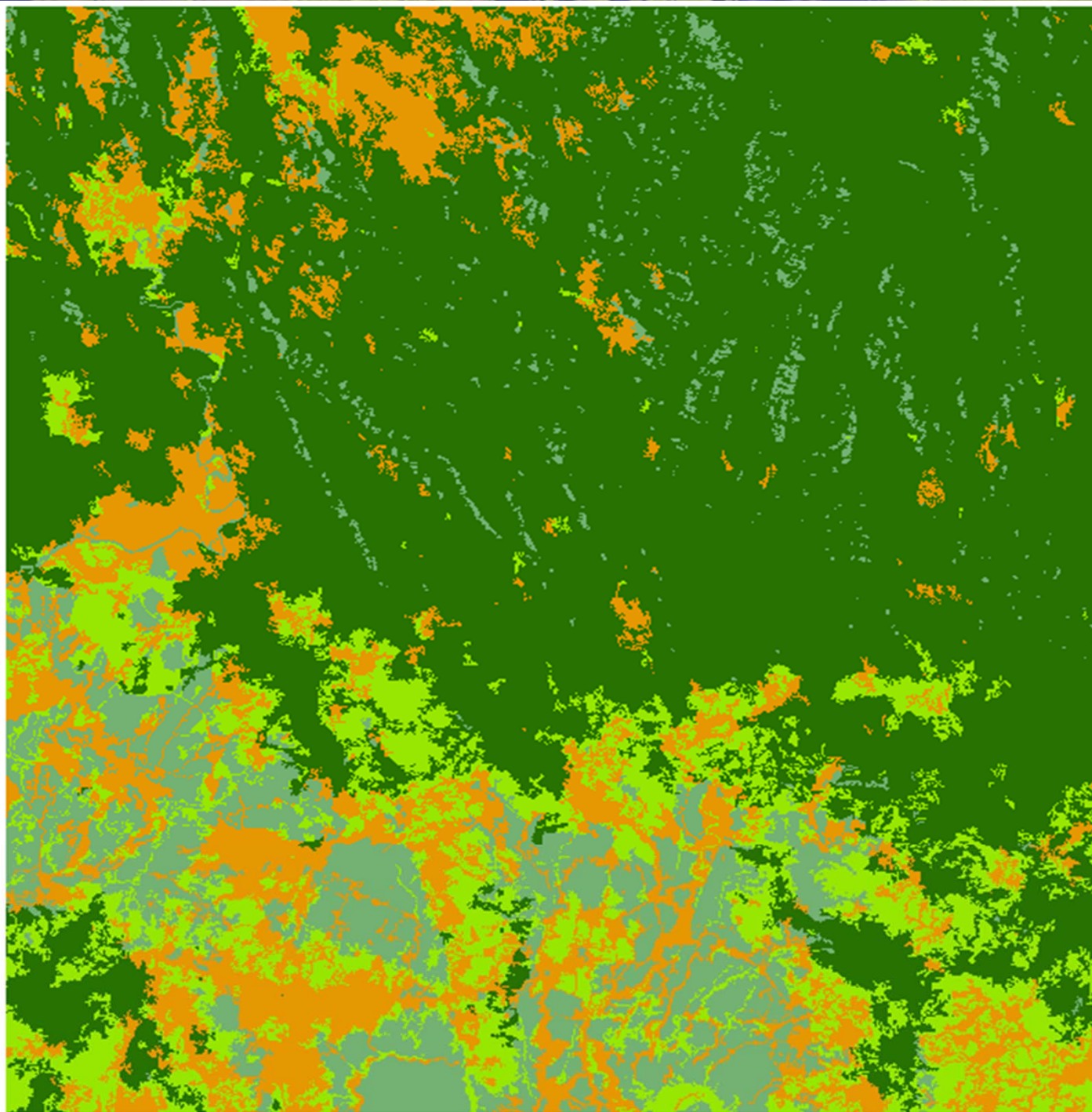


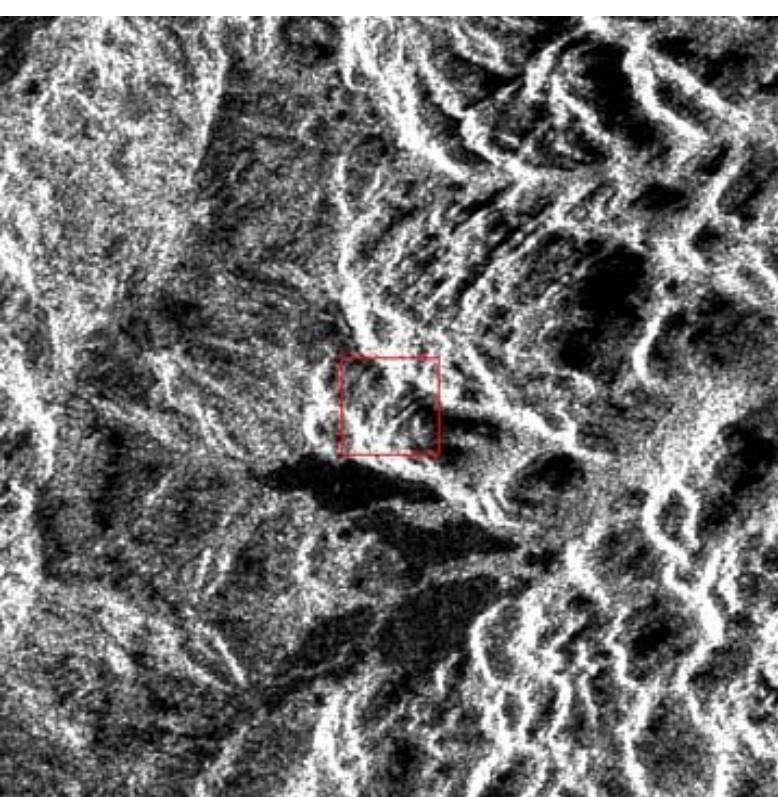


K&C Initiative

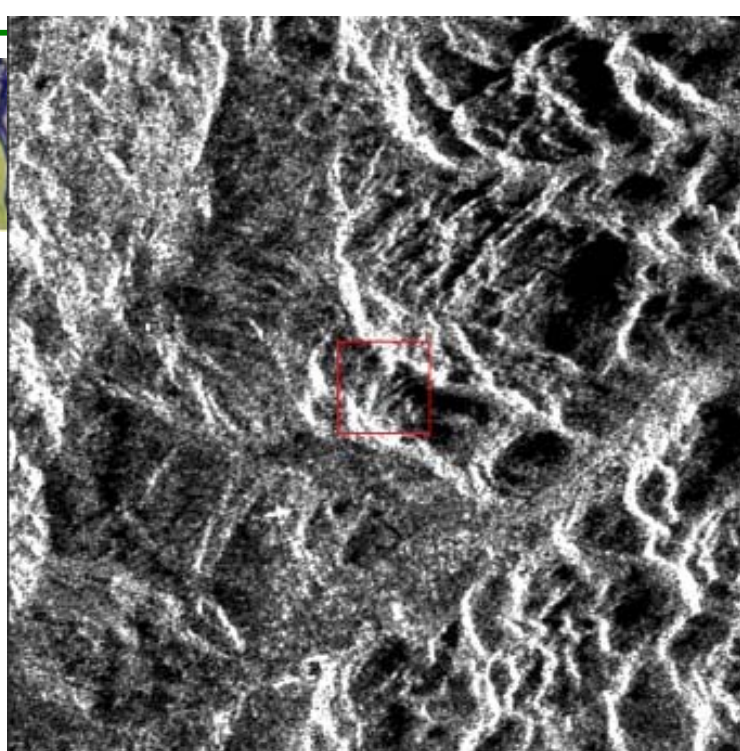
Class_name

- Crop
- Open / shrub
- Forest
- Mix Plantation

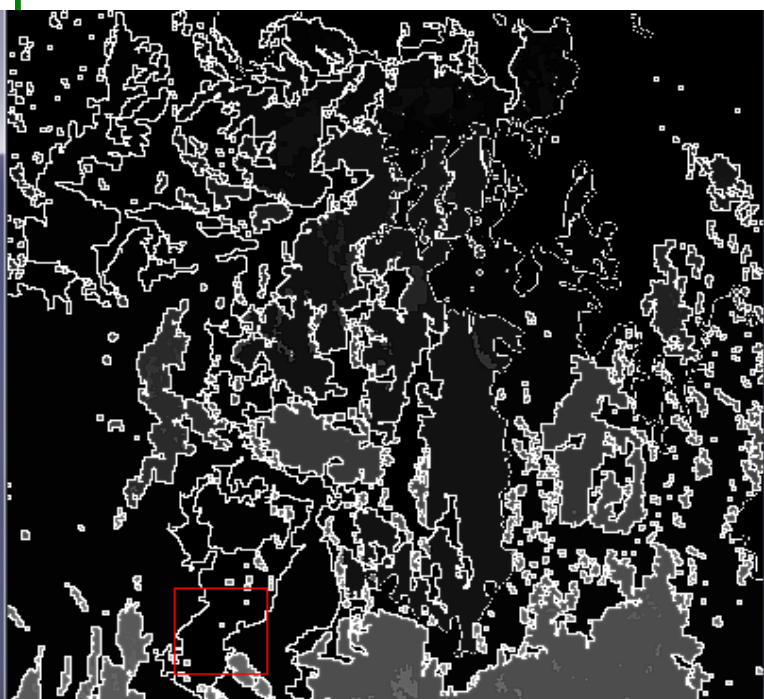




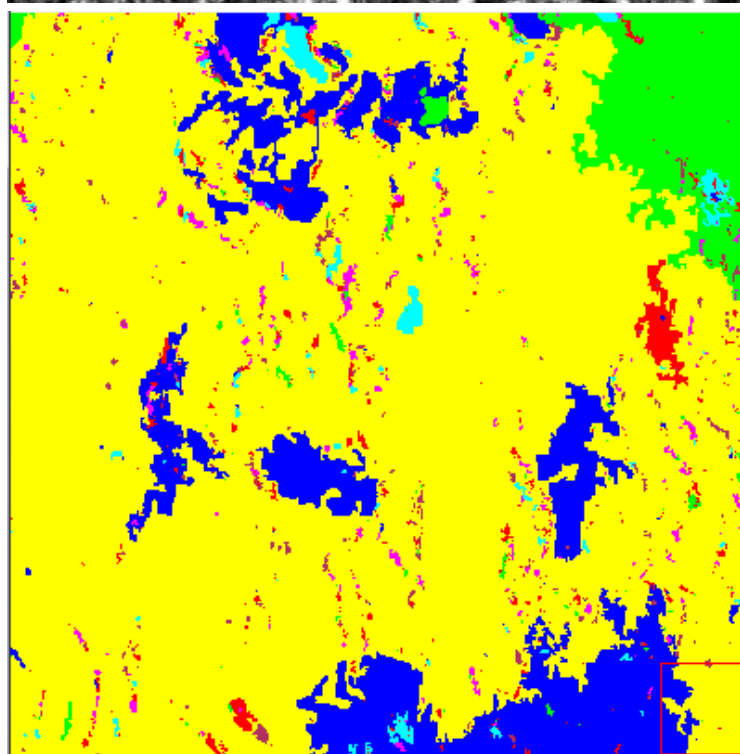
Palsar
HV



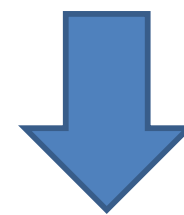
Palsar
HH



Segme
ntation



Classification
result



Need
ground
truth data

| | Forest | Non Forest | Producer Accuracy |
|---------------------|------------|------------|-------------------|
| Forest Coverage | 129,179.36 | 16,245.10 | 88.8% |
| Non Forest Coverage | 19,341.44 | 19,031.60 | 49.6% |
| User Accuracy | 87.0% | 53.9% | |

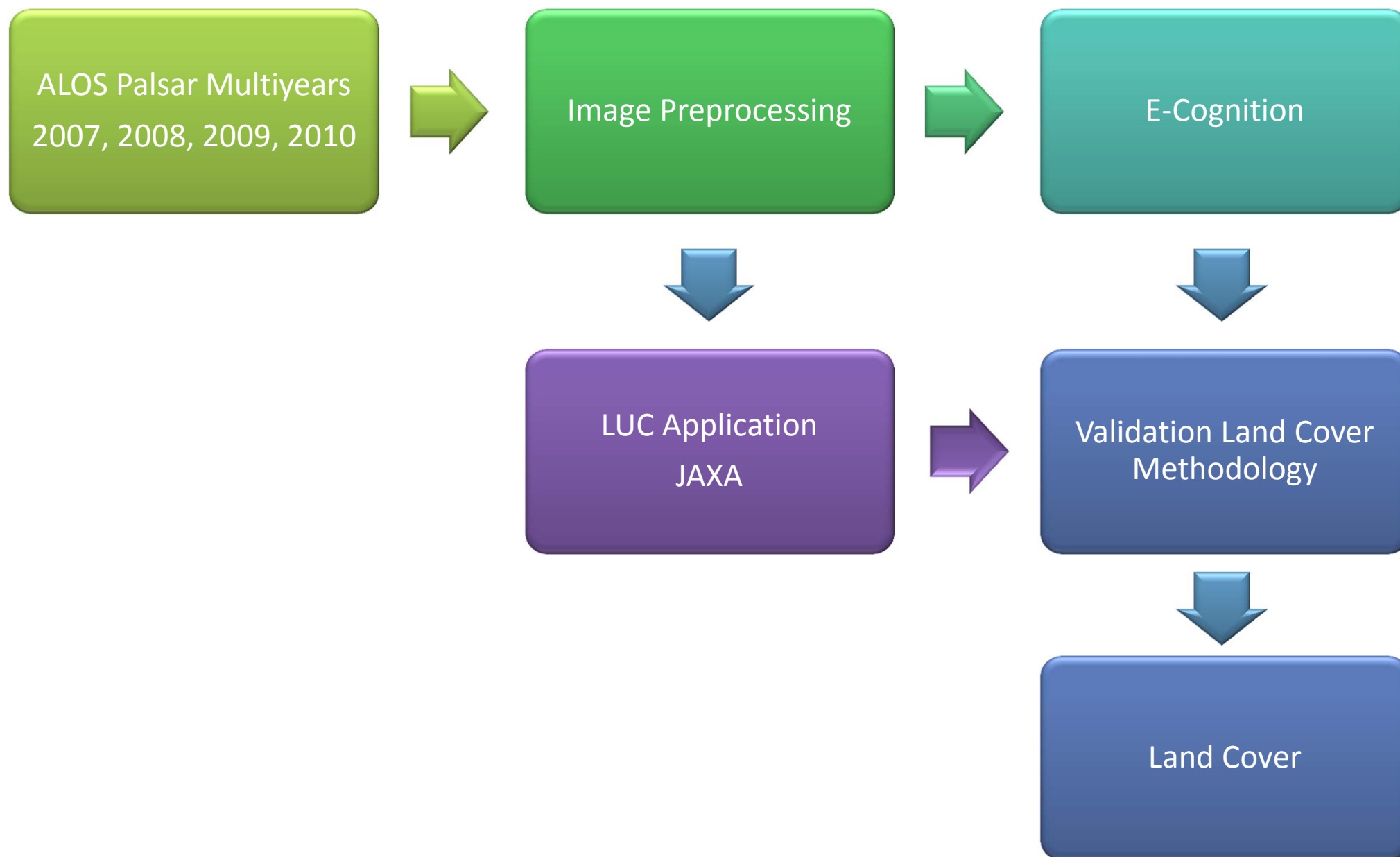
Notes:

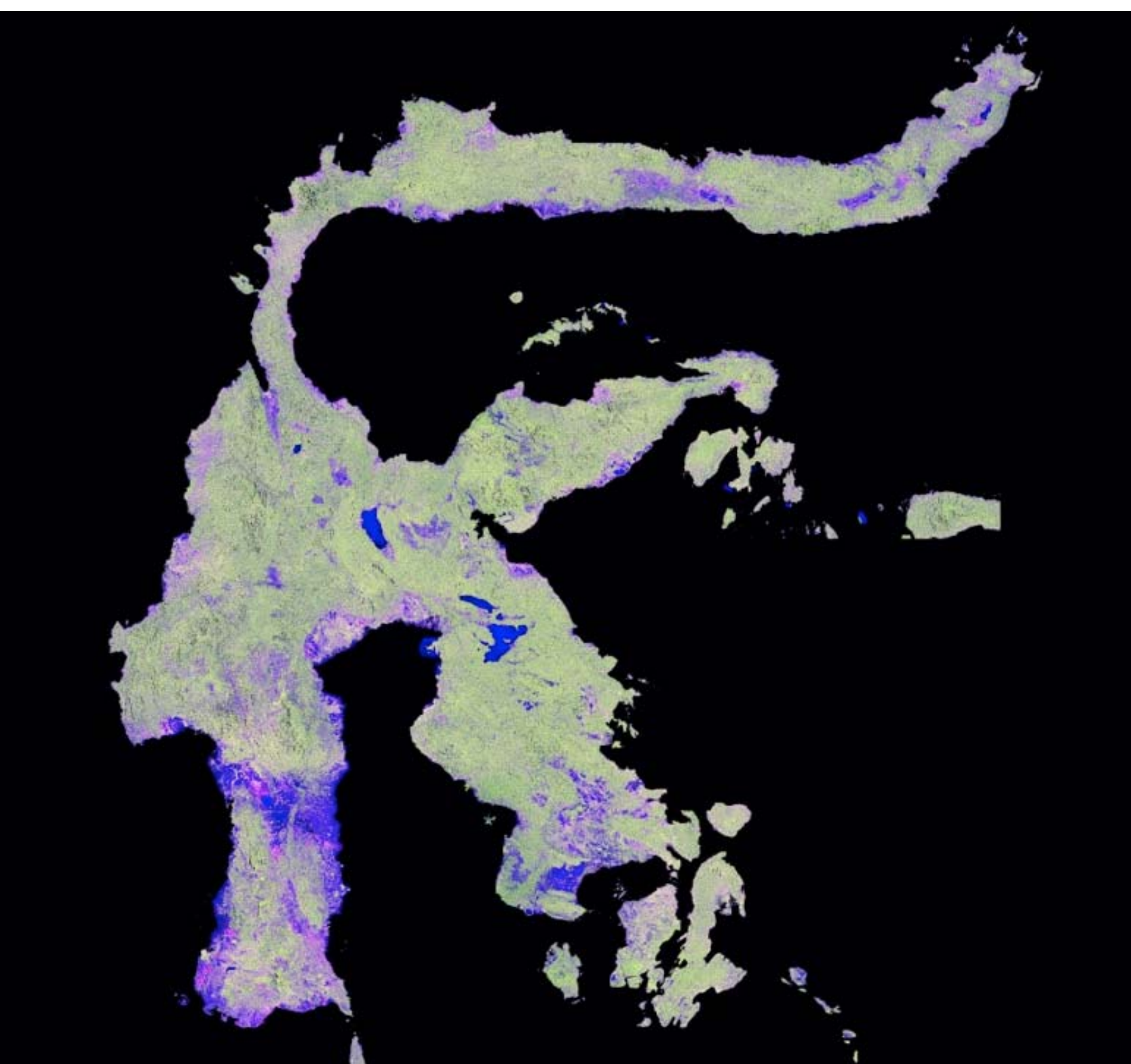
- Forest Coverage Classification Accuracy relatively good
- Non Forest Classification still needs improvement to separate vegetated area and non vegetated area
- Land Cover Classification using LUC Application needs work on ground truth data.

ALOS

Land Cover Classification

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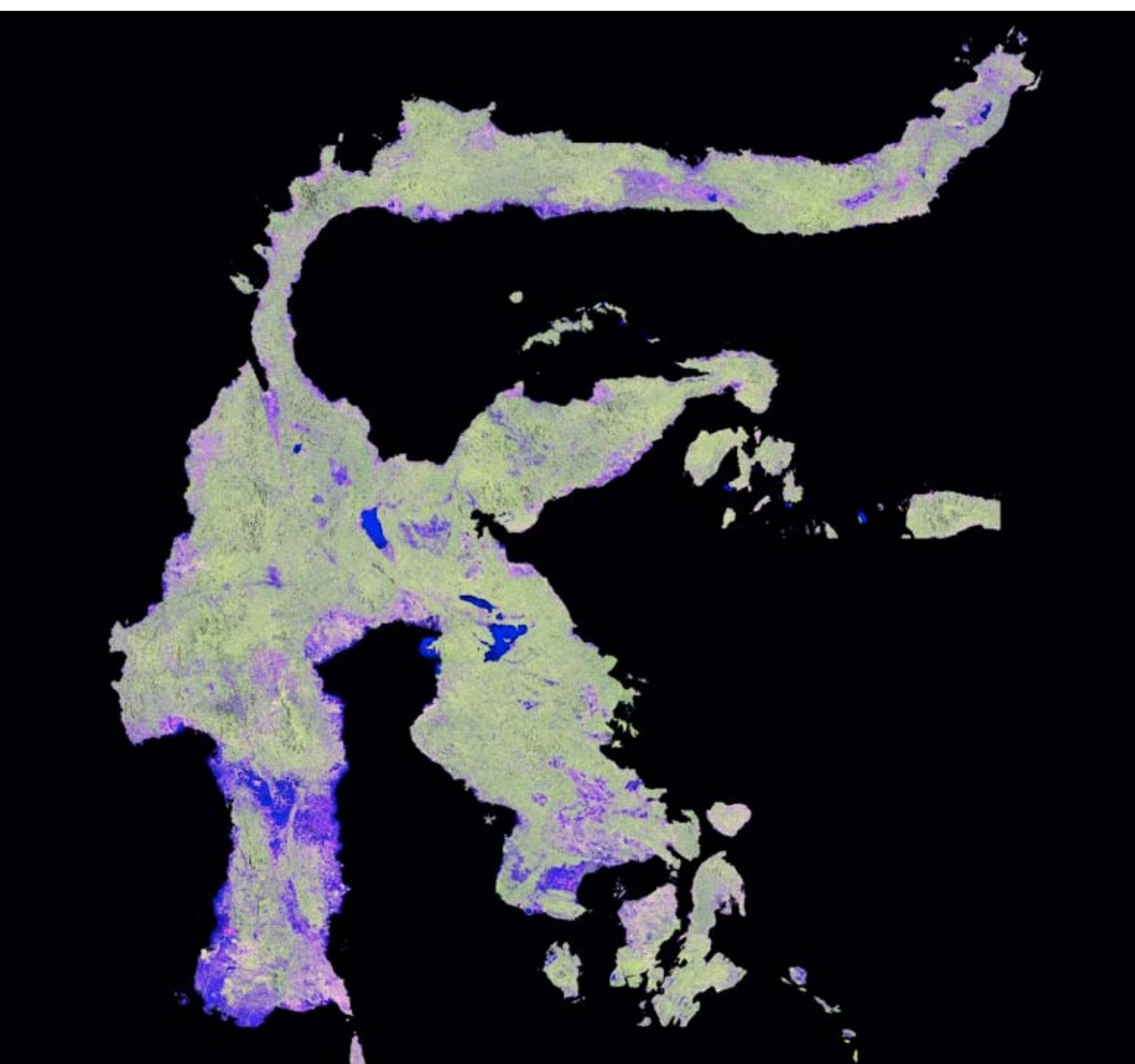




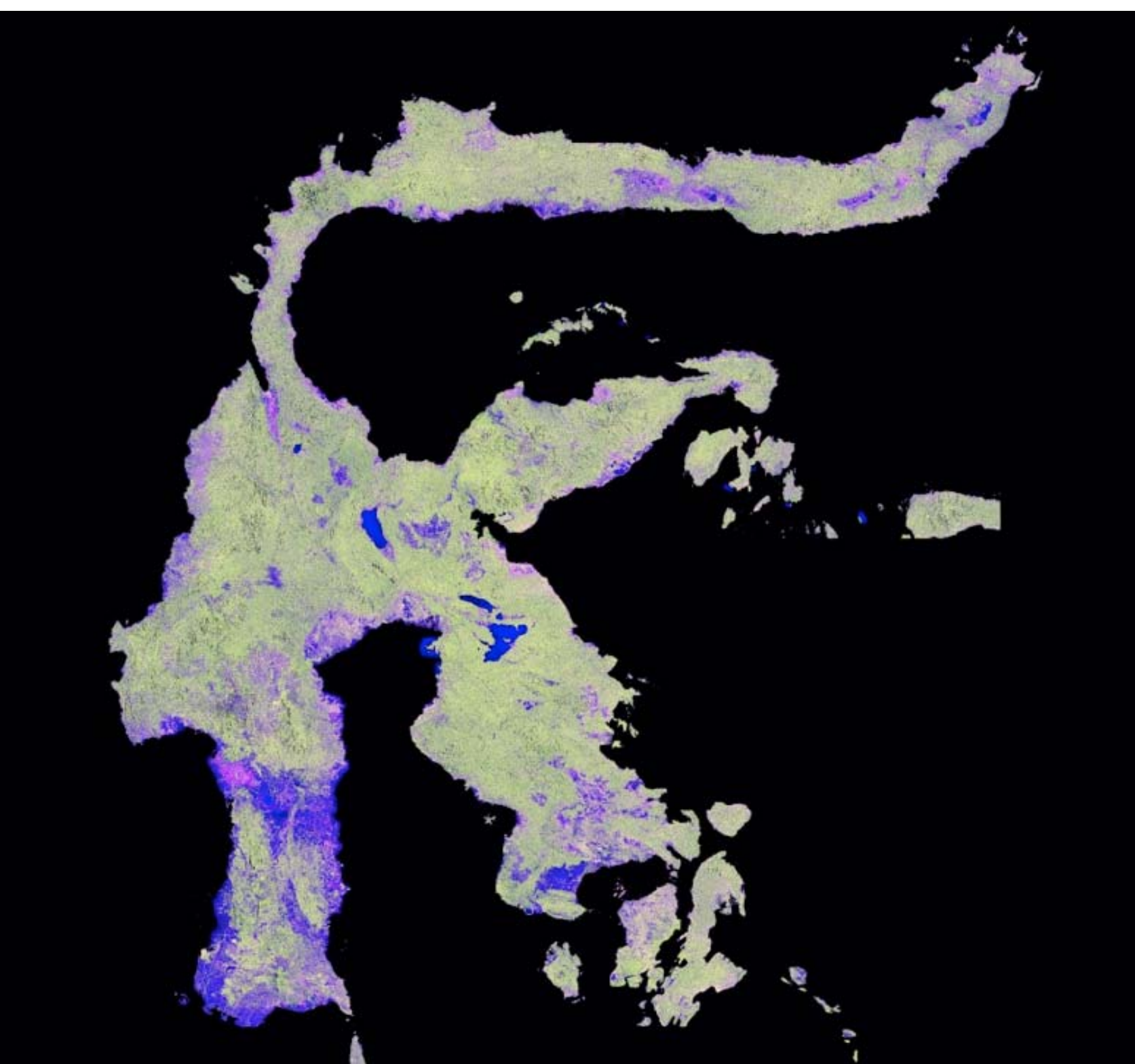
Initiative
2007
ce collaboration led by JAXA

Mosaic Data of
Alos.

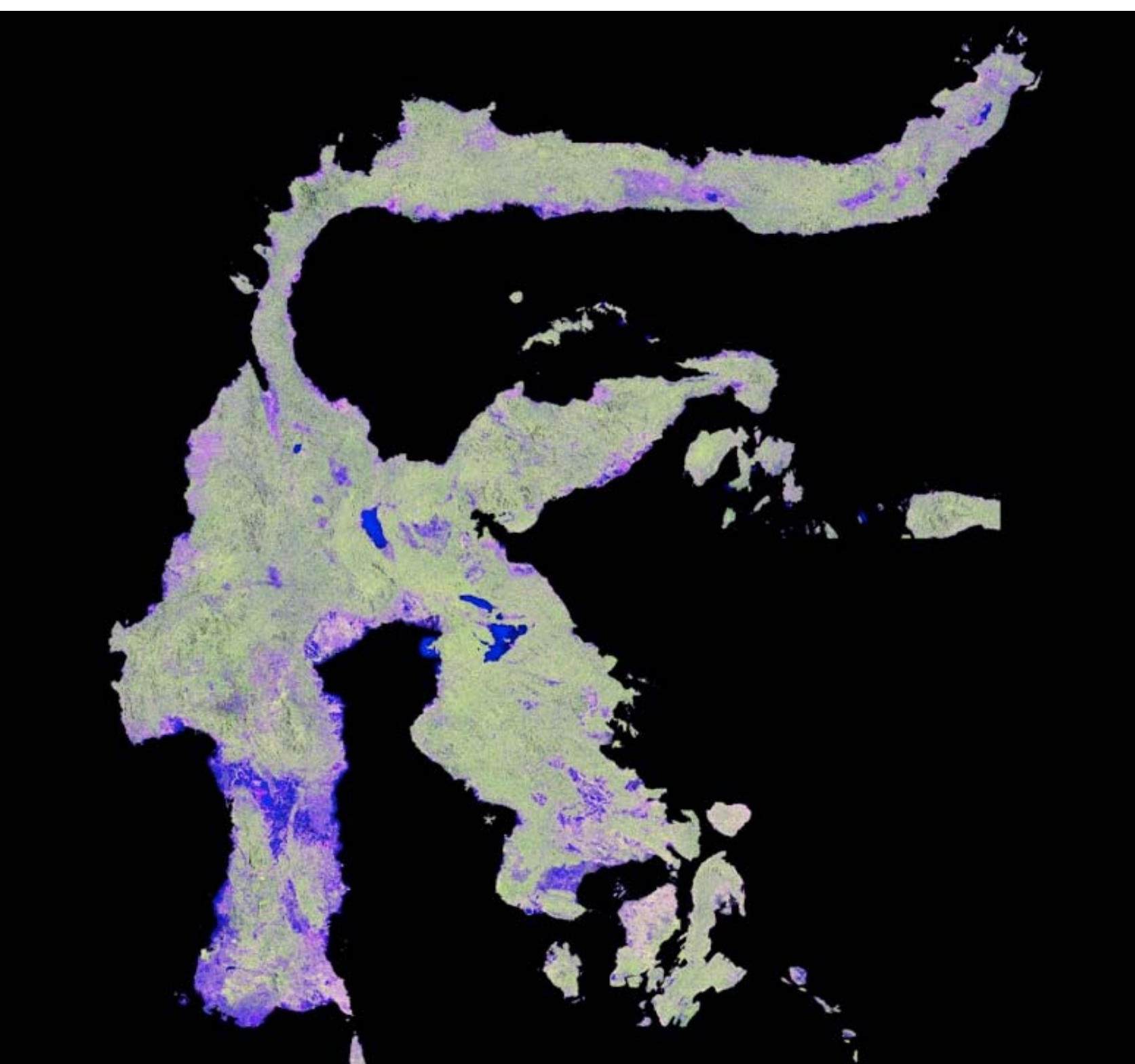
Most probably
ligh green area
are trees stand



Initiative
2008
ce collaboration led by JAXA



Initiative
2009
ce collaboration led by JAXA



Initiative
2010
ce collaboration led by JAXA



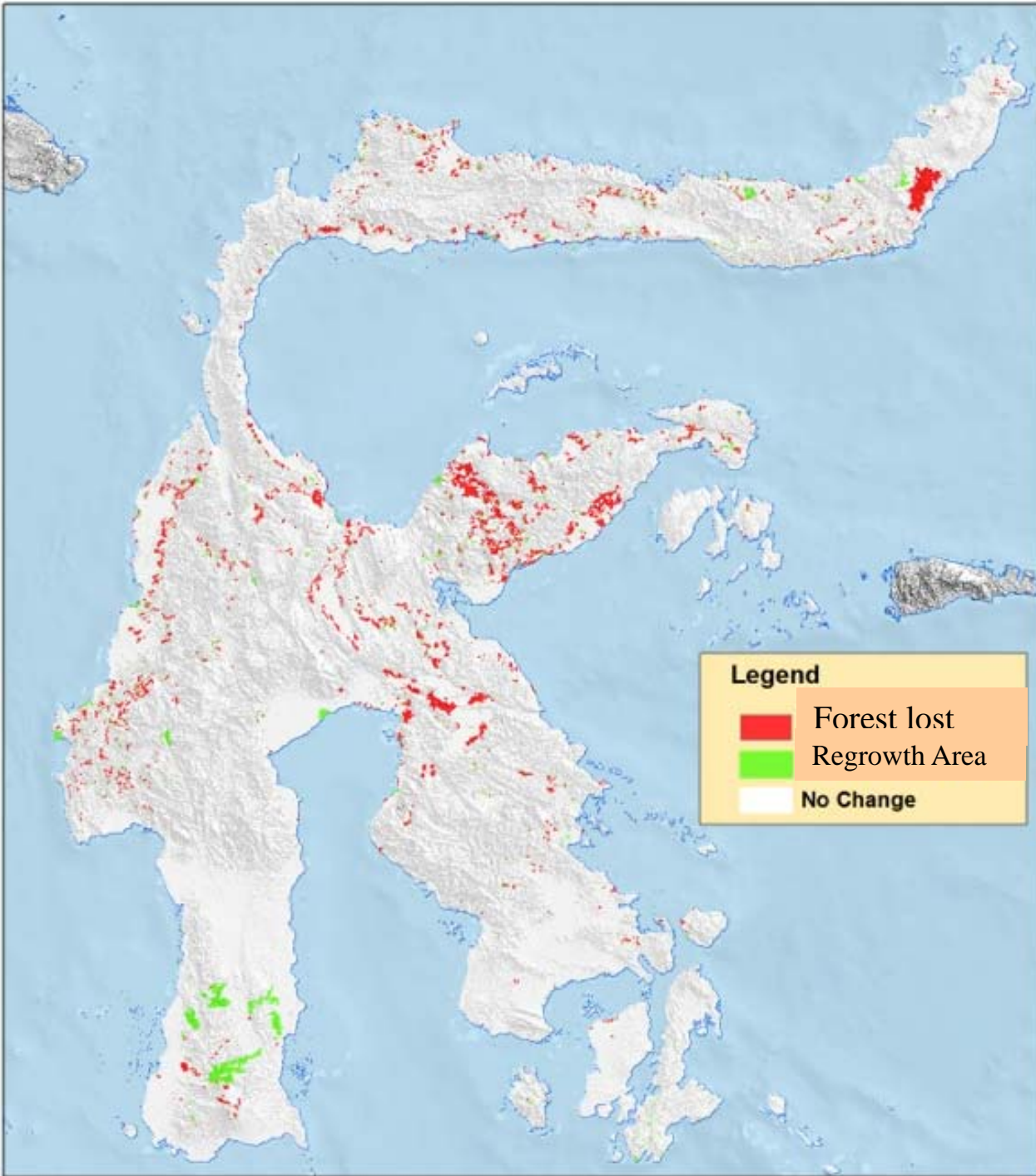
2010 ALOS
Multispectral
Red : H, Green V,
Blue :
Normalized
synthetic band

| | Forest | Non Forest | Producer Accuracy |
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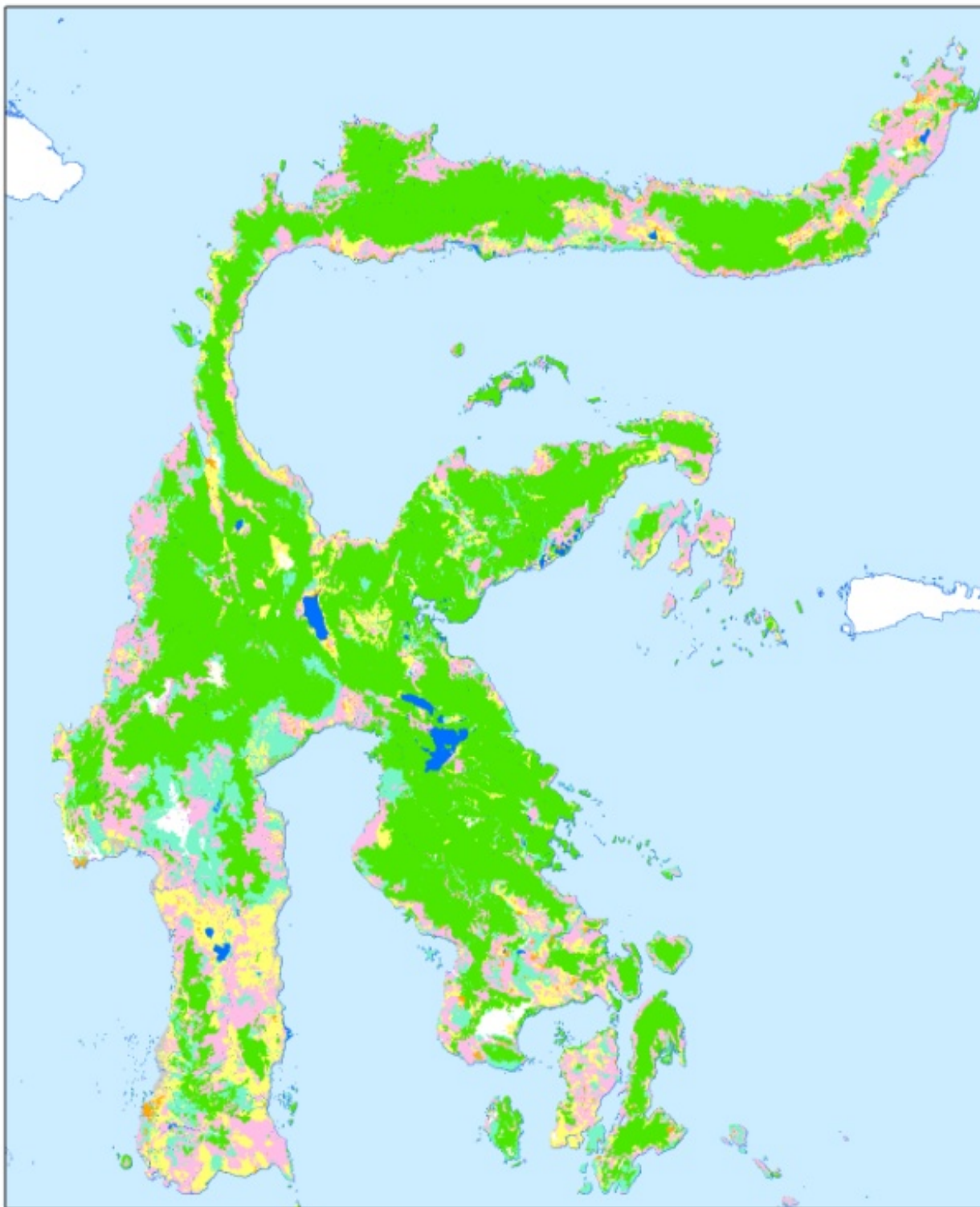
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Land and Forest Change



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Legend

- Building Area
- Forest
- Agriculture
- Open Area
- Plantation
- others
- Water Body
- Non Forest Vegetation

2008

2011

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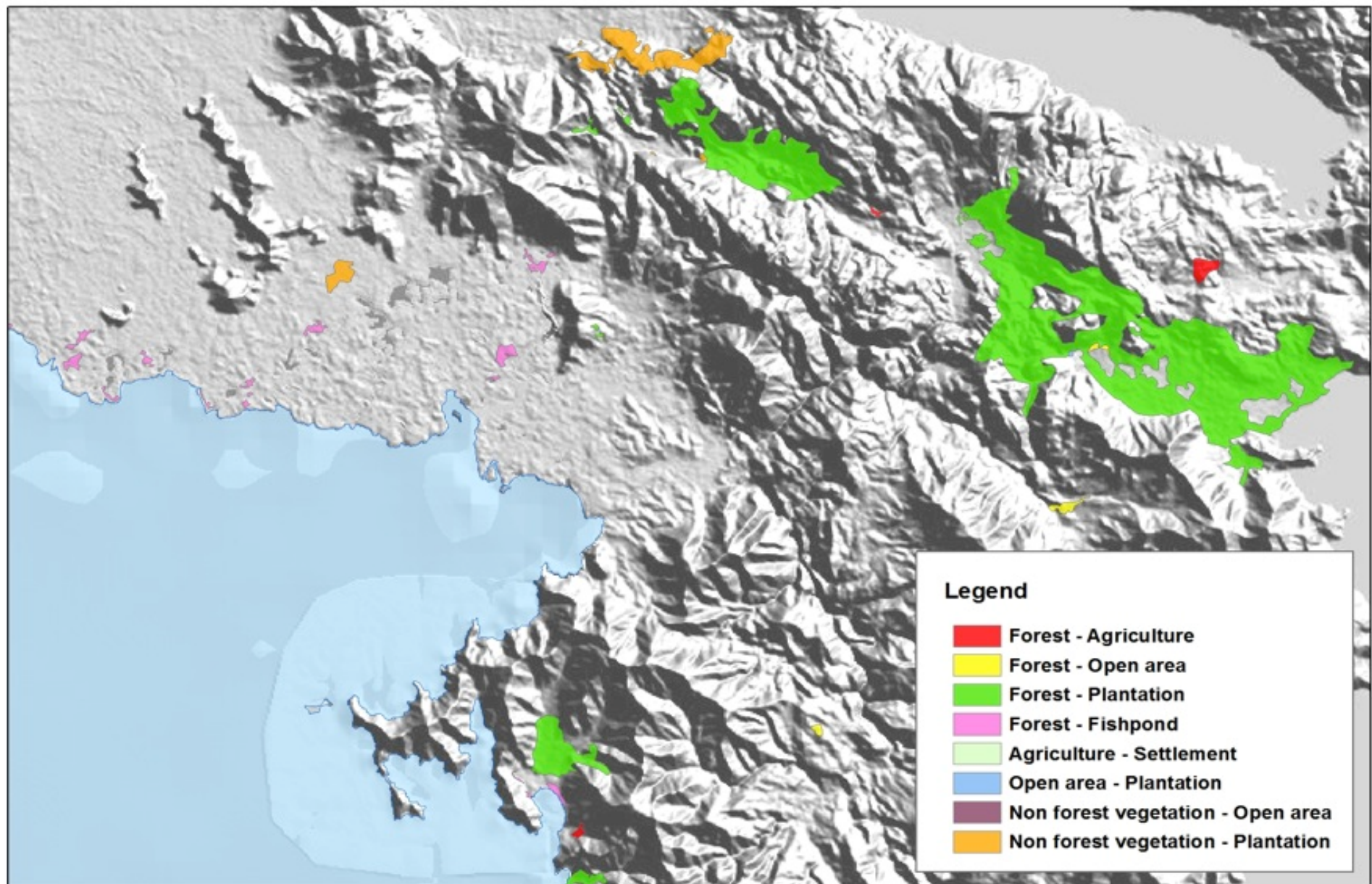
Legend

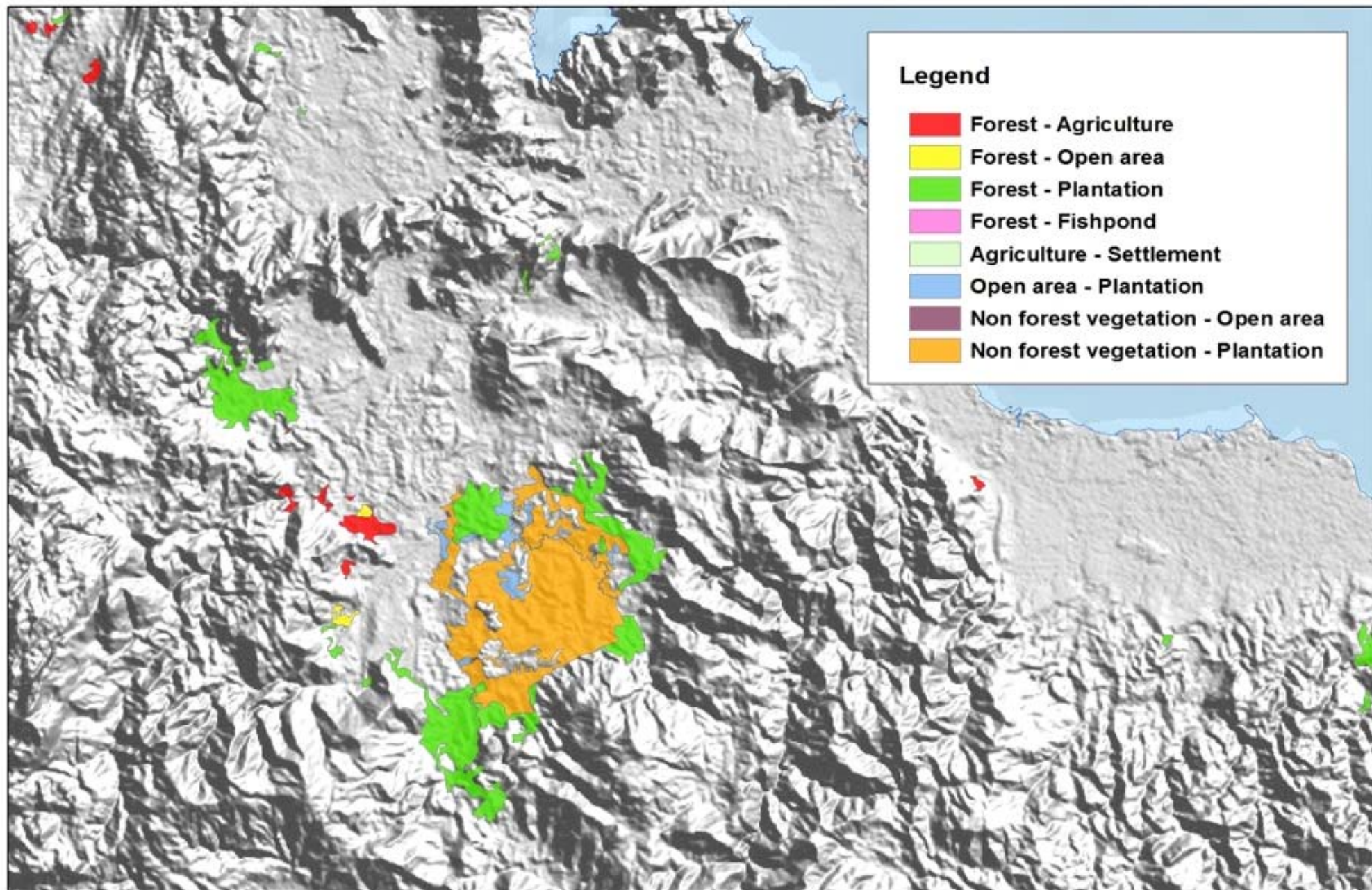
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- Forest
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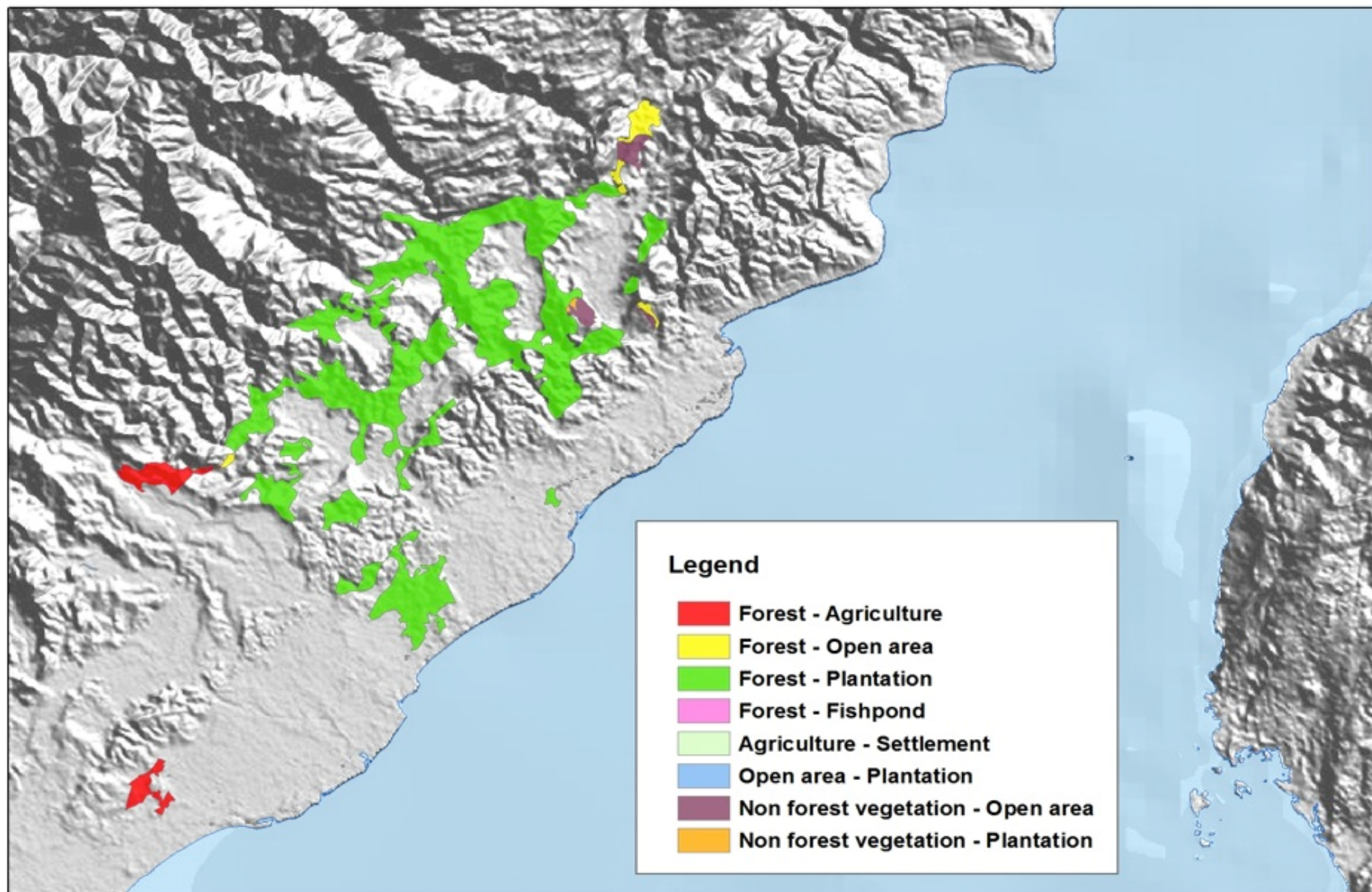
Legend

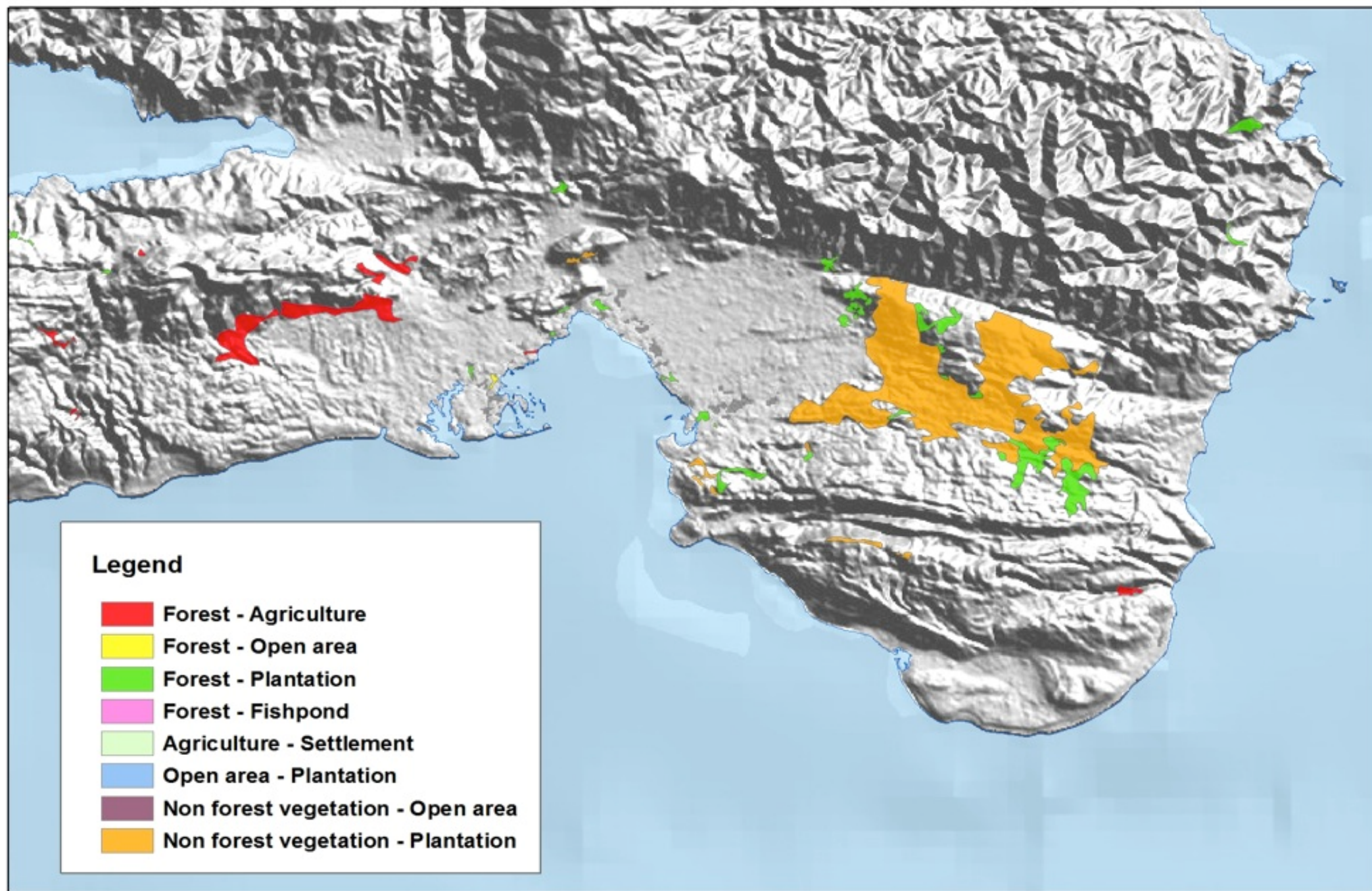
- Forest
- Non Forest





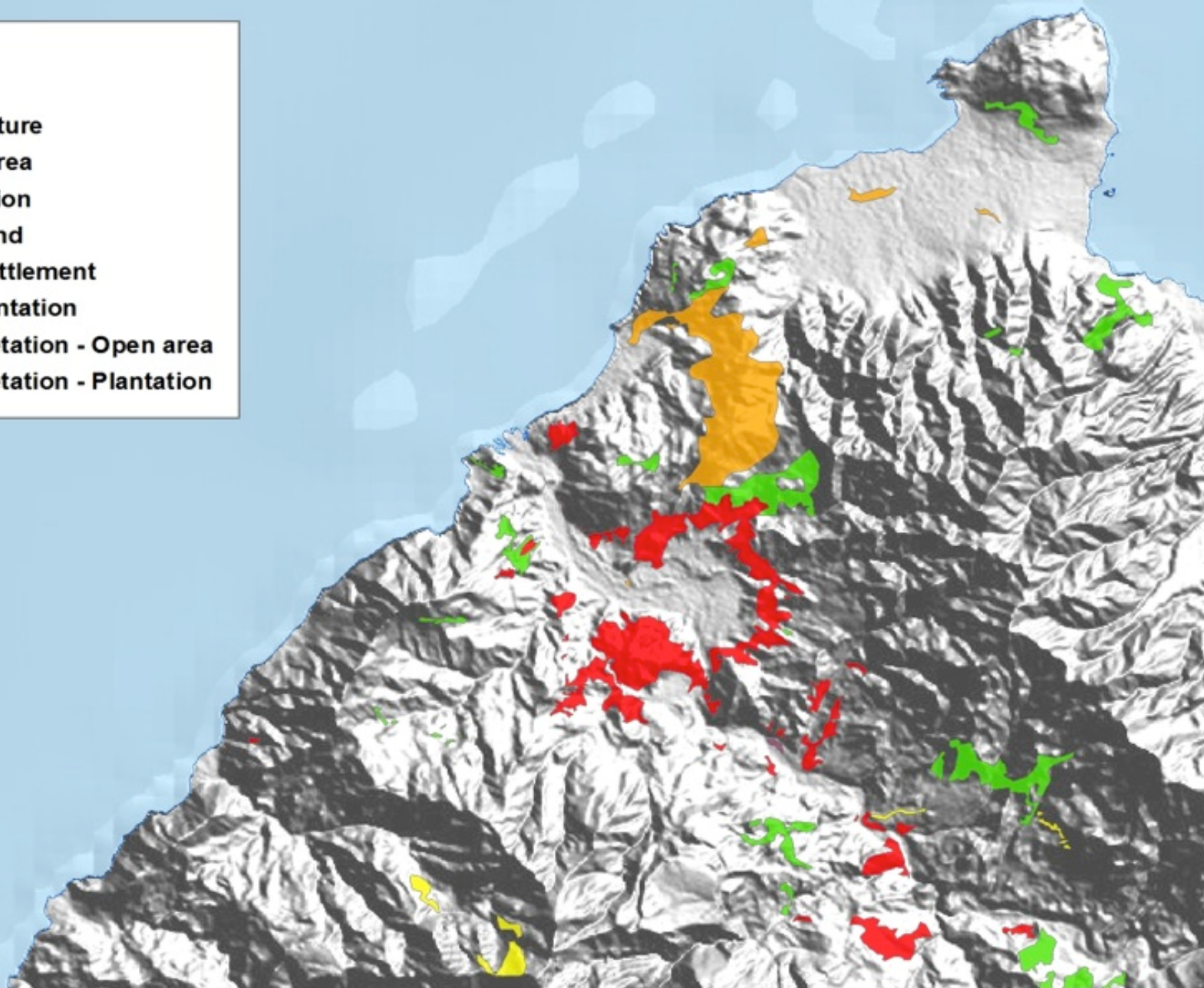






Legend

- Forest - Agriculture
- Forest - Open area
- Forest - Plantation
- Forest - Fishpond
- Agriculture - Settlement
- Open area - Plantation
- Non forest vegetation - Open area
- Non forest vegetation - Plantation





ALOS

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Arigato Gozaimasu