K&C Phase 3 – Brief project essentials

Climate-Relevant Modernization of the National Forest Policy and Piloting of REDD+ Measures in the Philippines

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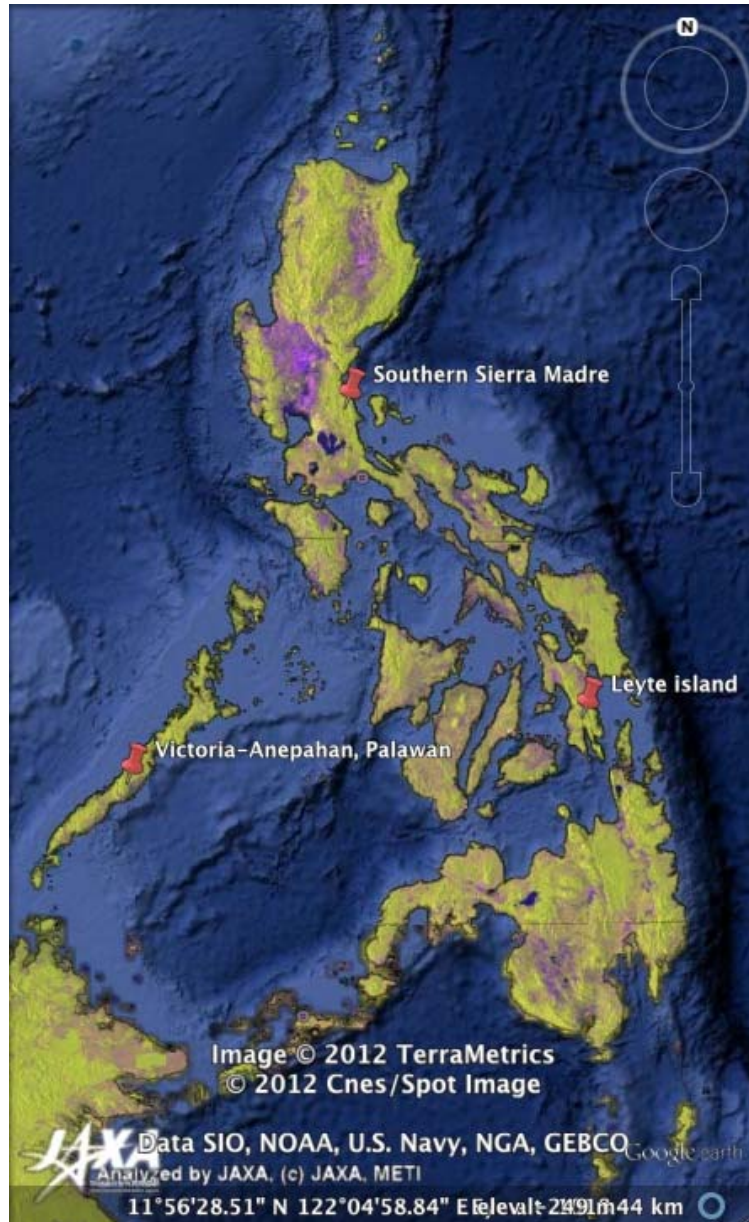
Project areas: Philippines

Sub-national REDD+ Pilot Sites

1. Southern Sierra Madre mountain range
2. Leyte island
3. Victoria-Anepahan mountain range, Palawan island

K&C Project Collaborators and Partners

Project Collaborators

1. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

2. Fauna & Flora International (FFI)

3. Department of Geodetic Engineering, University of the Philippines (UP-DGE)

Partners & Supporting Agencies

1. Department of Environment and Natural Resources: Forest Management Bureau & National Mapping and Resource Information Authority

2. Non-Timber Forest Products – Task Force / Exchange Programme

3. TEaM Energy Foundation in the Philippines

4. European Commission

5. Energy Development Corporation

Project objectives

For each of the three identified REDD+ pilot sites, the project aims to:

1. Establish baseline forest carbon stocks

2. Pilot forest carbon inventory and monitoring methods in support of validating ALOS PALSAR imageries

3. Determine reference deforestation rate

Support to JAXA's global forest mapping effort

1. Sharing of in-situ data from forest inventories and other field activities from REDD+ sites

2. Validation of JAXA forest/non-forest cover maps and land use/land cover change maps

3. Input to development of algorithms for forest classification, carbon stock assessment, and forest stratification

The in-situ data that will be shared with JAXA includes: broad habitat and land cover types; location/GPS coordinates; tree diameter, merchantable tree height, and tree species; tree canopy cover; leaf litter; and deadwood.

Deliverables

The project envisions the following results:

☐ Forest cover and change maps produced

☐ Deforestation rates determined

☐ Baseline forest carbon stocks established

☐ Image processing methodologies and accuracy
assessments documented

Updates

LEYTE ISLAND

Leyte: field sampling design
(Systematic Cluster Distribution)

Forest Points - Coverage above 2/3 in 124 m diameter circle

NonForest Points - Coverage between 1/3 and 2/3 in 124 m diameter circle

Cluster Center Point

Distance 50 m

Sampling Point center

6 m radius 113 m² – trees 06-20 cm DBH

12 m radius 452 m² – trees > 20 cm DBH
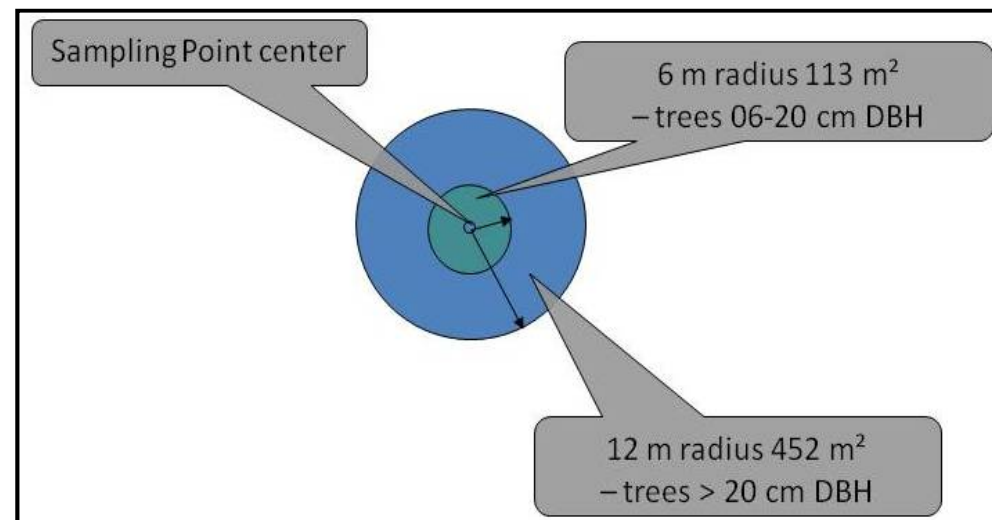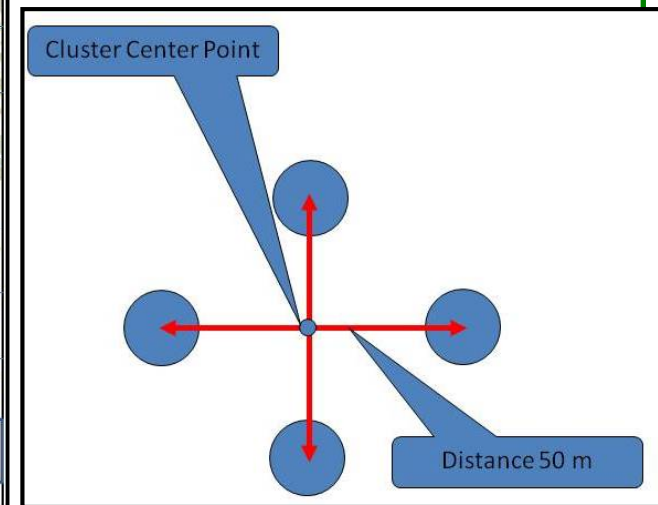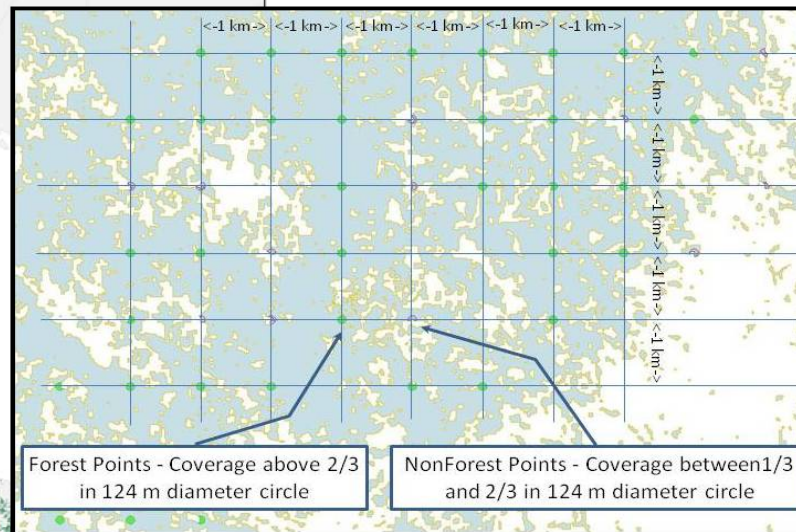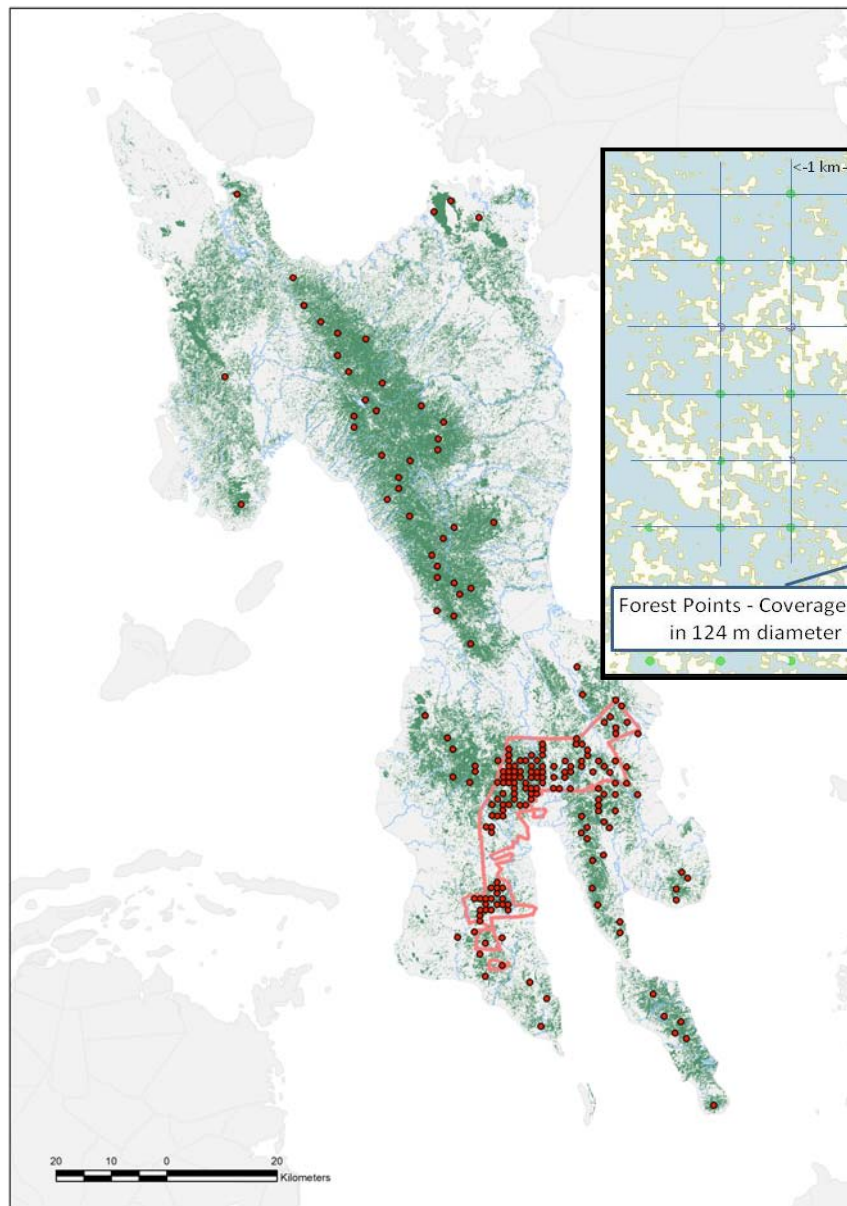
Ground Truth Data Acquired
(GPS with land cover assessment)

☐ **In summary (GPS points):**

⬇ **Total number of clusters: 150**

⬇ **Total number of assessed points (including the cluster center): 750**

1. **Forest = 589**
   - ☐ Abandoned kaingin
   - ☐ Closed Forest
   - ☐ Primary Forest
   - ☐ Secondary Forest
   - ☐ Secondary/Residual
   - ☐ Plantation/Reforestation

2. **Non-Forest = 125**
   - ☐ Abaca/Mixed = 10
   - ☐ Coconut = 23
   - ☐ Coconut/Mixed = 34
   - ☐ Cultivated = 28
   - ☐ Brushland = 12
   - ☐ Clear/Reforestation = 16
   - ☐ NOTE: 2 points were not included (new kaingin areas)

3. **Others = 36**
   - ☐ No description = 14
   - ☐ Have some notes = 22 (may be cultivation or plantation)

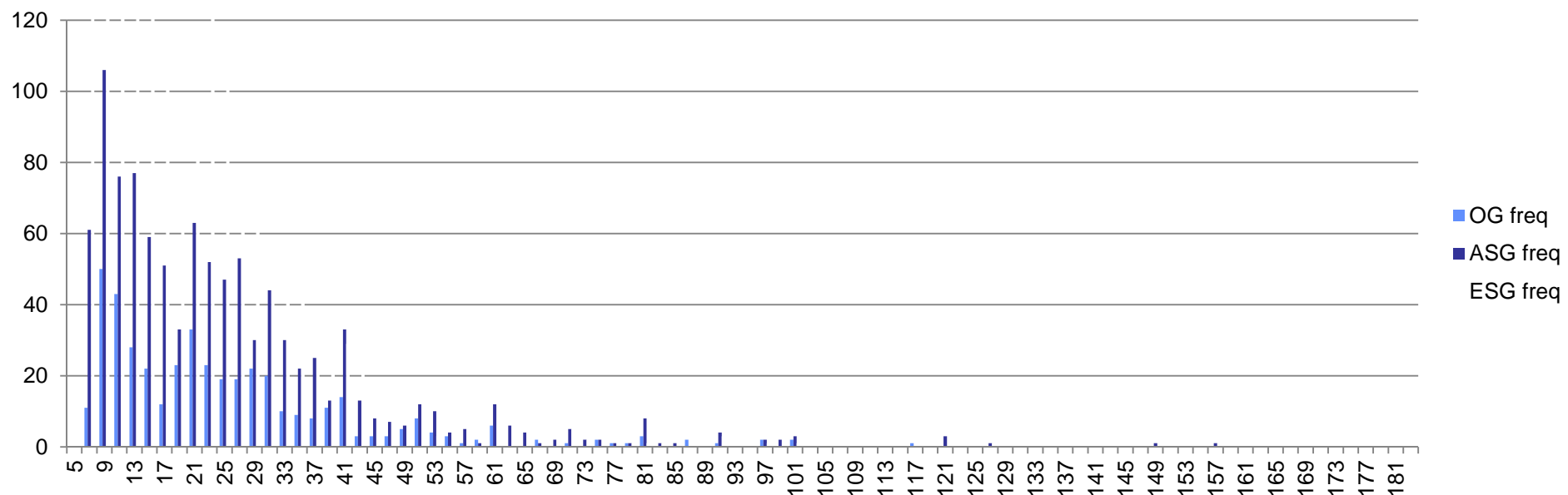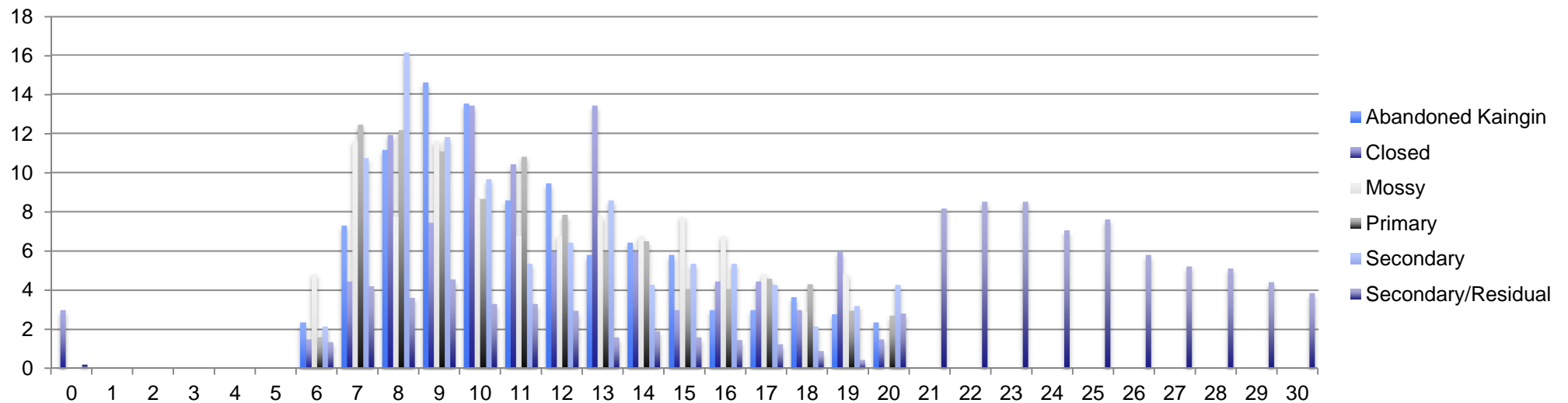☐ **In summary (Forest inventory database):**

⬇ Total number of clusters: 64
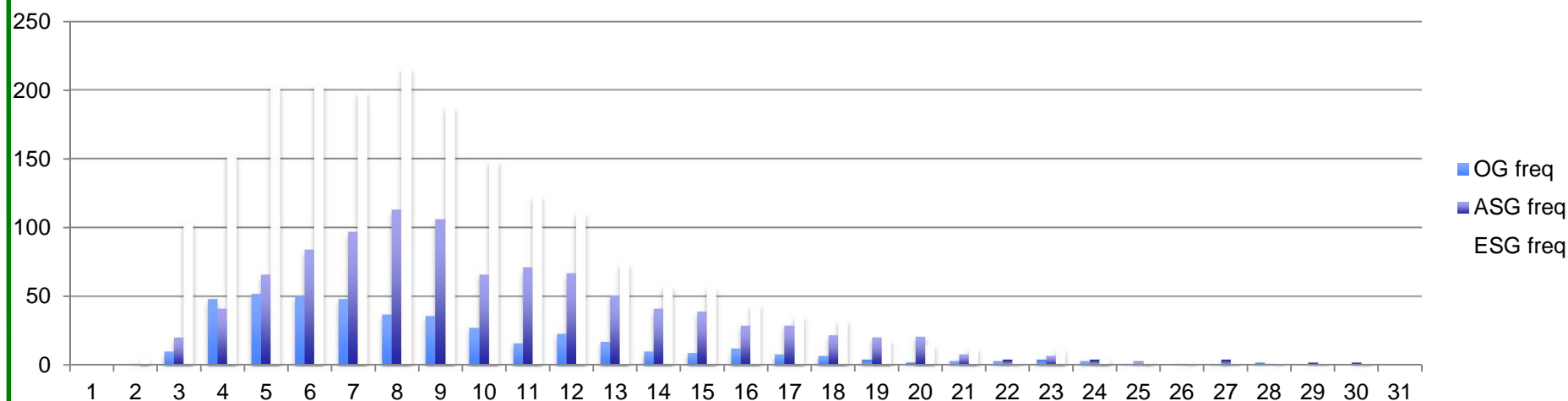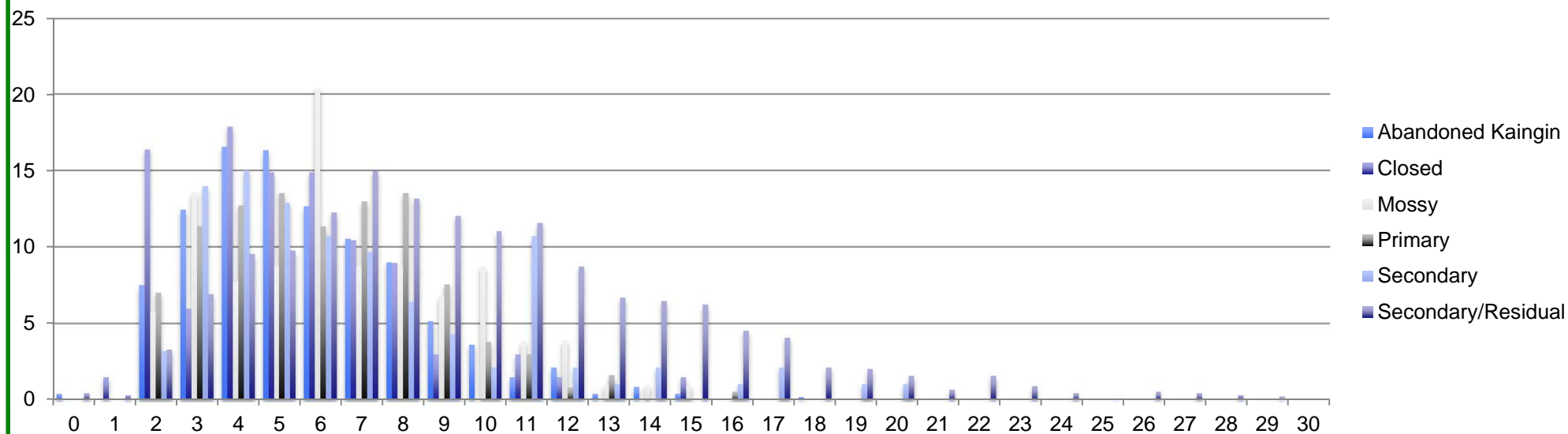   - i Note: there are 6 clusters that have missing/incomplete records.

⬇ Total number of plots: 209
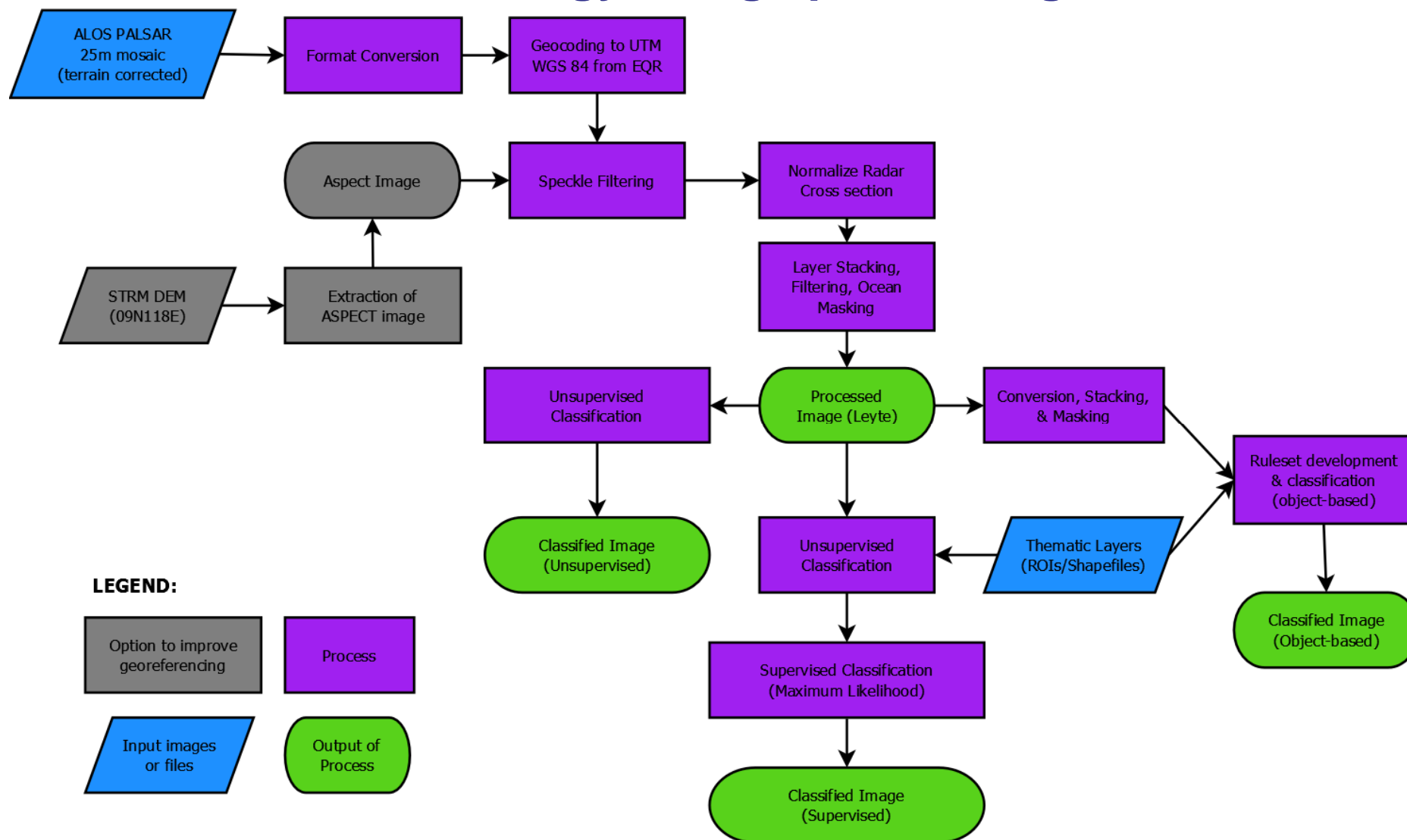   - i Still needs to be double checked

DBH histogram

Merchantable Tree Height histogram

Methodology: image processing

ALOS PALSAR 25m mosaic (terrain corrected) → Format Conversion → Geocoding to UTM WGS 84 from EQR

Aspect Image → Speckle Filtering → Normalize Radar Cross section

STRM DEM (09N118E) → Extraction of ASPECT image → Aspect Image

Normalize Radar Cross section → Layer Stacking, Filtering, Ocean Masking → Processed Image (Leyte)

Processed Image (Leyte) → Unsupervised Classification → Classified Image (Unsupervised)

Processed Image (Leyte) → Conversion, Stacking, & Masking → Ruleset development & classification (object-based) → Classified Image (Object-based)

Unsupervised Classification ← Thematic Layers (ROIs/Shapefiles)

Unsupervised Classification → Supervised Classification (Maximum Likelihood) → Classified Image (Supervised)

LEGEND:

- Option to improve georeferencing
- Process
- Input images or files
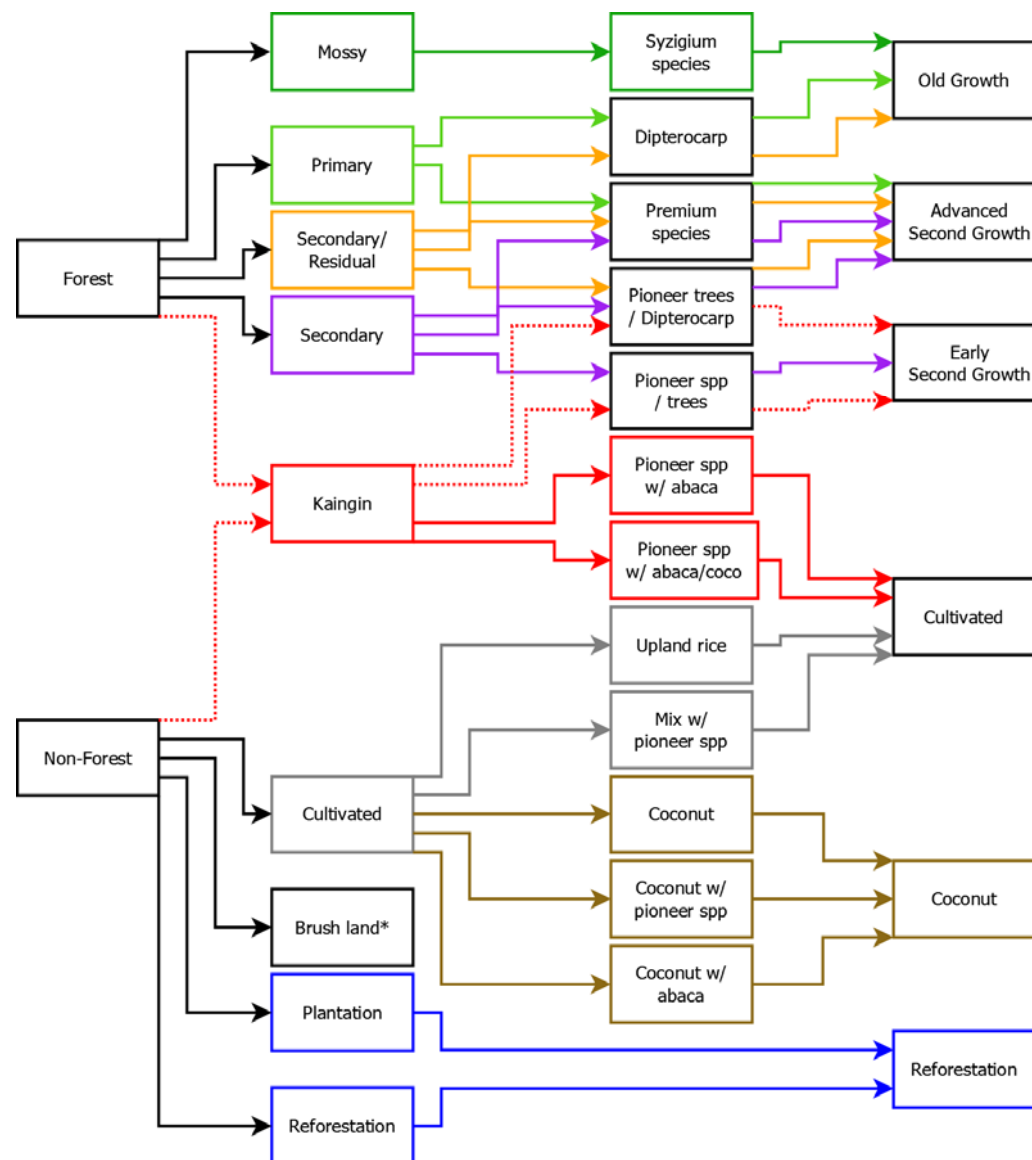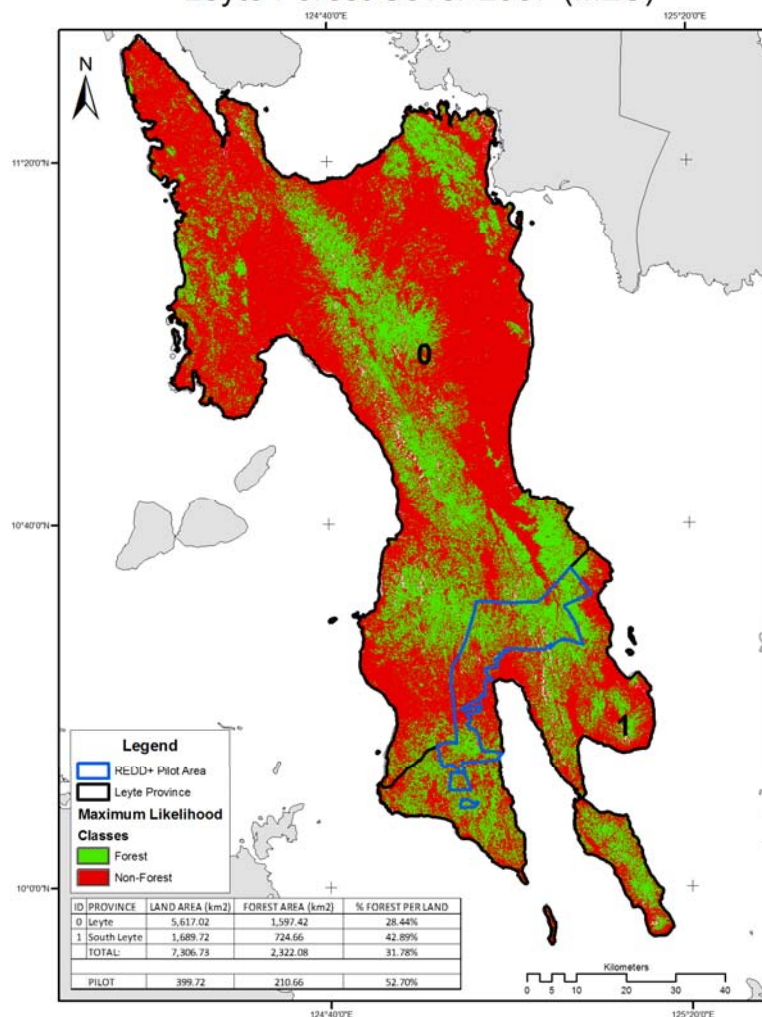- Output of Process

Forest Resource Assessment

Southern Leyte (GIZ):
Total of 150 of 200 (?) clusters have been assessed.

Northern Leyte (Energy Development Corporation):
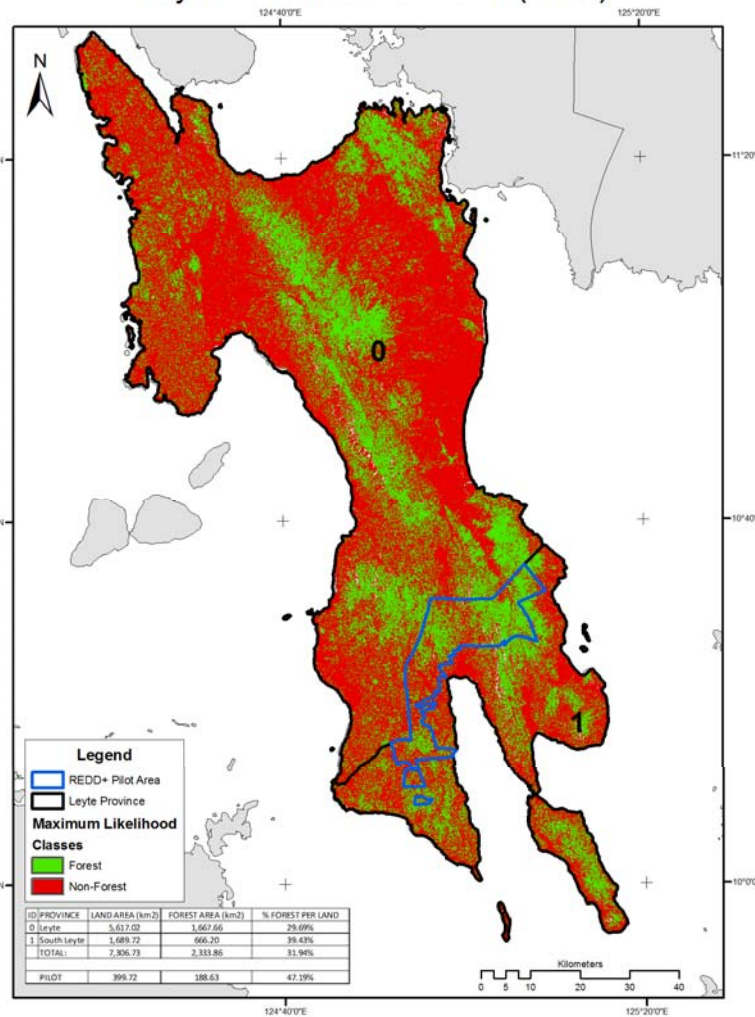In progress

Forest Cover Maps 2007 & 2010 (Change Detection)

Updates

SOUTHERN SIERRA MADRE & PALAWAN

Initial Processing of the
ALOS/PALSAR 25-meter Mosaic

ALOS 25M frames

⬇

Mosaic Tiles (Pixel Based)

⬇

Geocoding of Tiles

⬇

Speckle Filtering

⬇

Convert to Normalized Cross-section

⬇

Unsupervised Classification

⬇

Classified Image
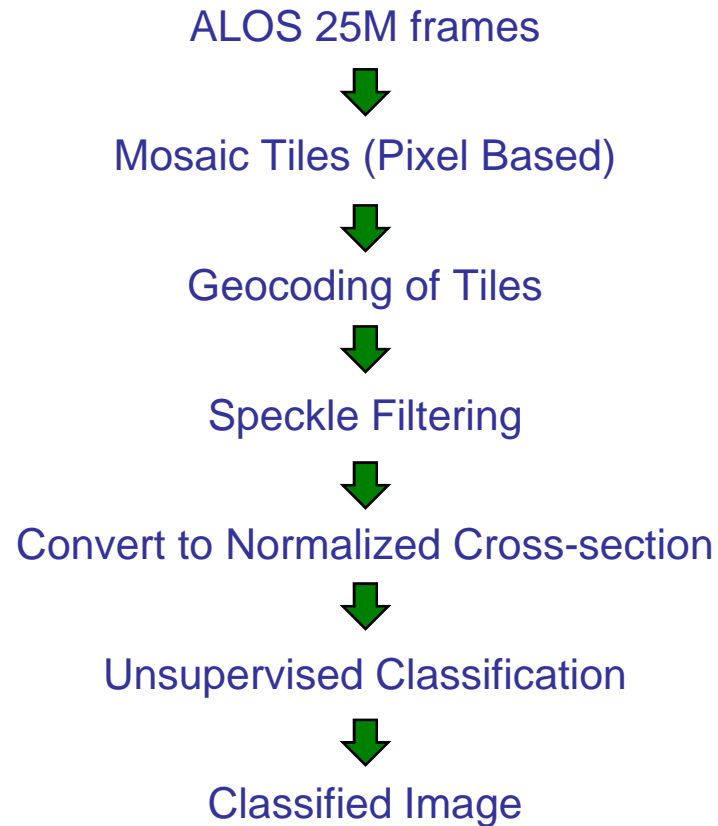
ALOS

K&C Initiative
An international science collaboration led by JAXA

UNSUPERVISED CLASSIFICATION IMAGE - ALOS PALSAR 25M ORTHO-SLOPE CORRECTED MOSAIC (PALAWAN 2010 HH-HV-HH/HV)

DRAFT COPY
NOT FOR
CIRCULATION

BASE DATA LEGEND
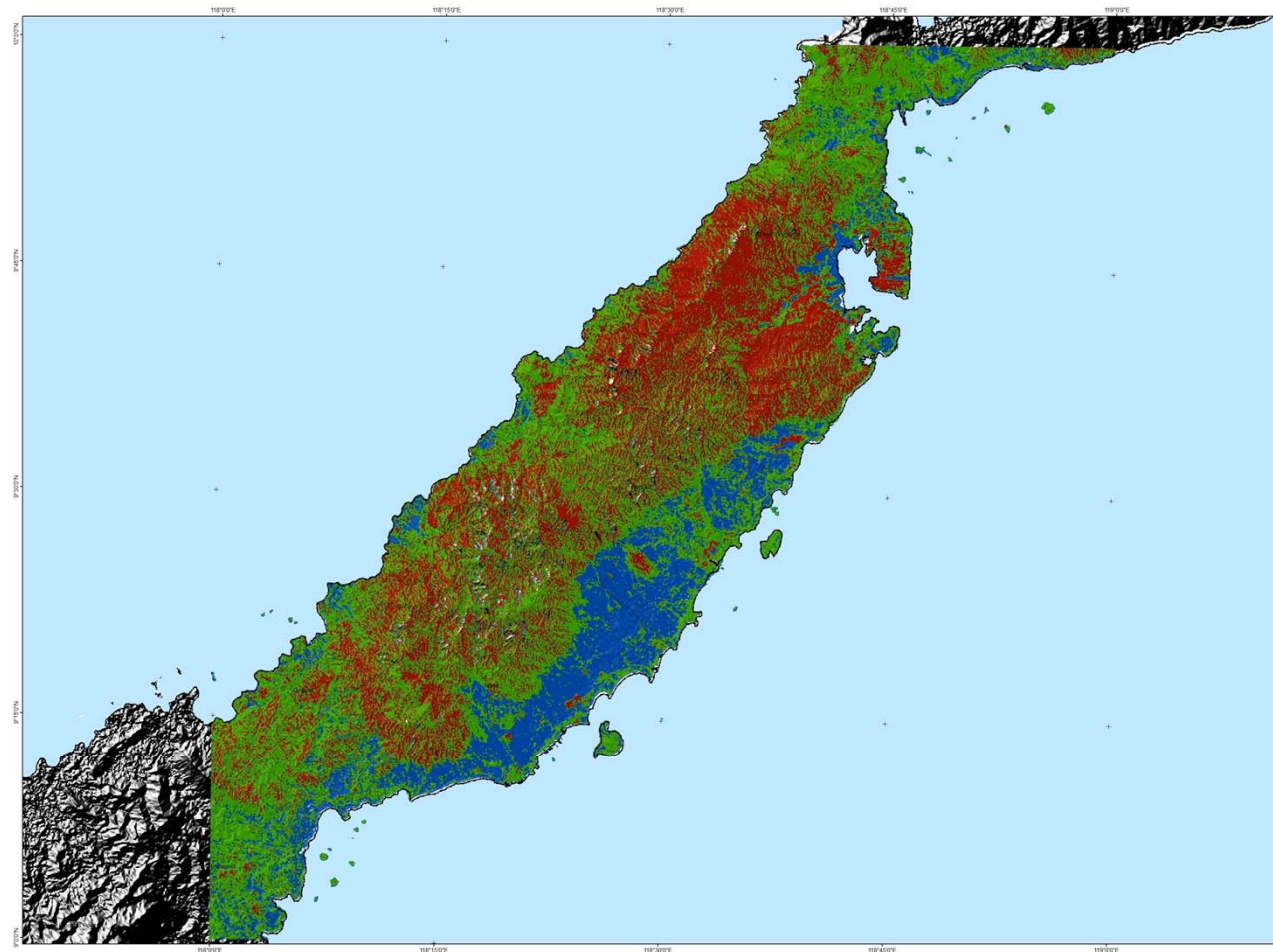
ALOS PALSAR 25M MOSAIC

Provincial Boundaries
Road Network
Spot Elevation
Rivers

Unsupervised Classification Image version1

Class 1: Non - Forest (blue)
Class 2: Forest type 1 (may include mangrove forest and other vegetation)
Class 3: Forest type 2 (may include dense forest and vegetation)

Victoria Anepahan Mountain Range, Palawan

Region 4B

1:169,479
Kilometers

10   5   0   10   20

SPHEROID...CLARKE 1866
PROJECTION.............UNIVERSAL TRANSVERSE MERCATOR
VERTICAL DATUM.........................MEAN SEA LEVEL
HORIZONTAL DATUM...............................WGS84

FAUNA & FLORA
INTERNATIONAL
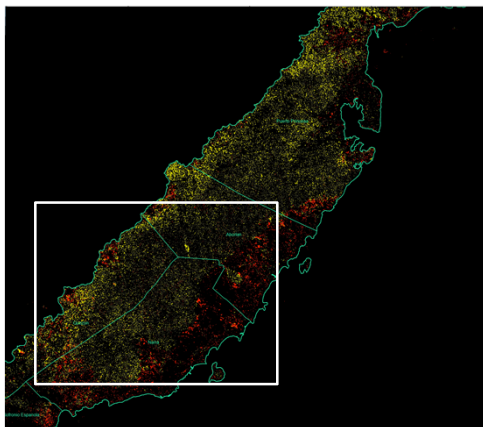
Change Detection Preliminary Results
Victoria Anepahan Mountain Range,
Palawan
2007 – 2010

RED >> vegetated to non-vegetated
YELLOW >> forest type1 to forest type2
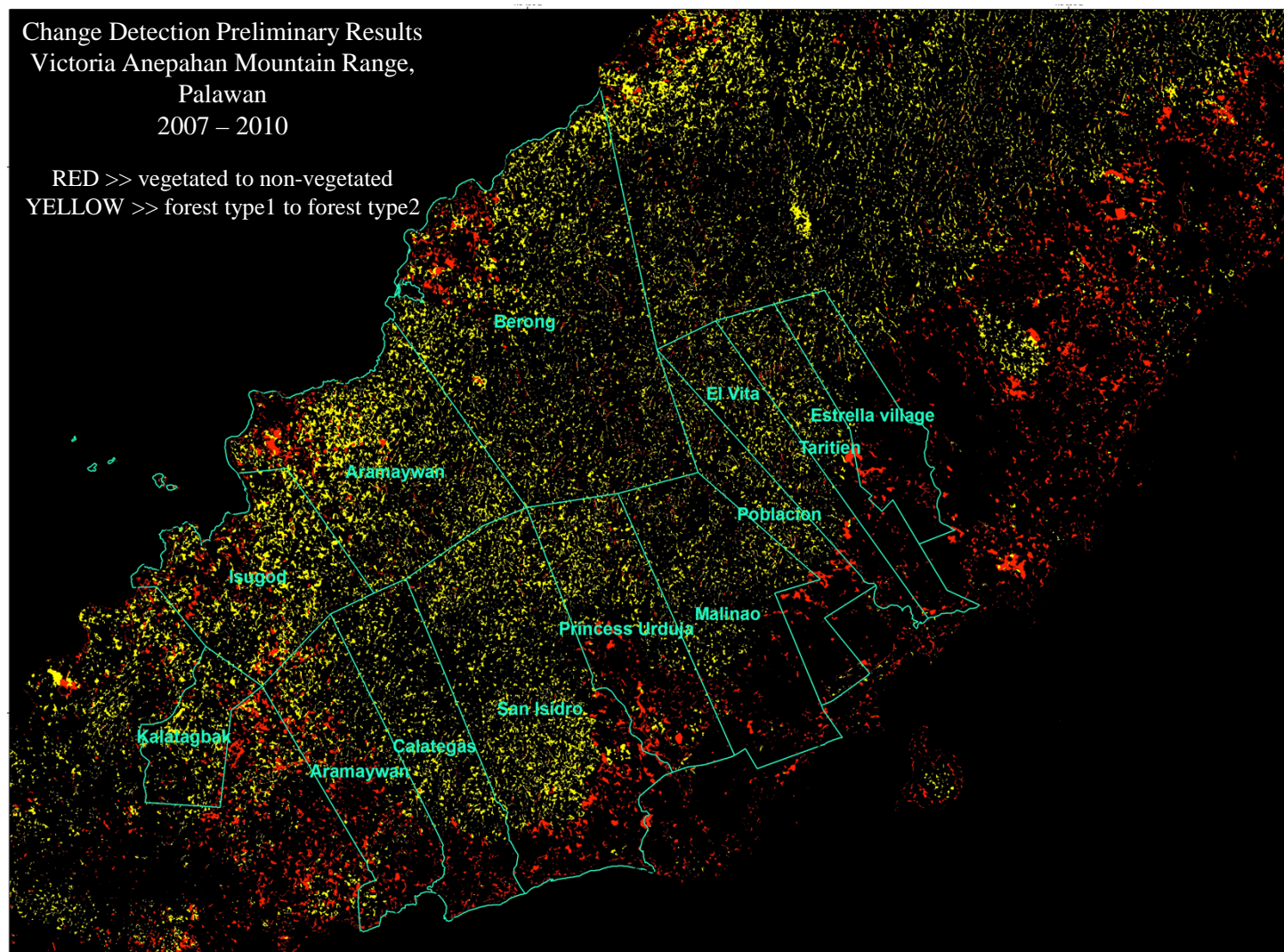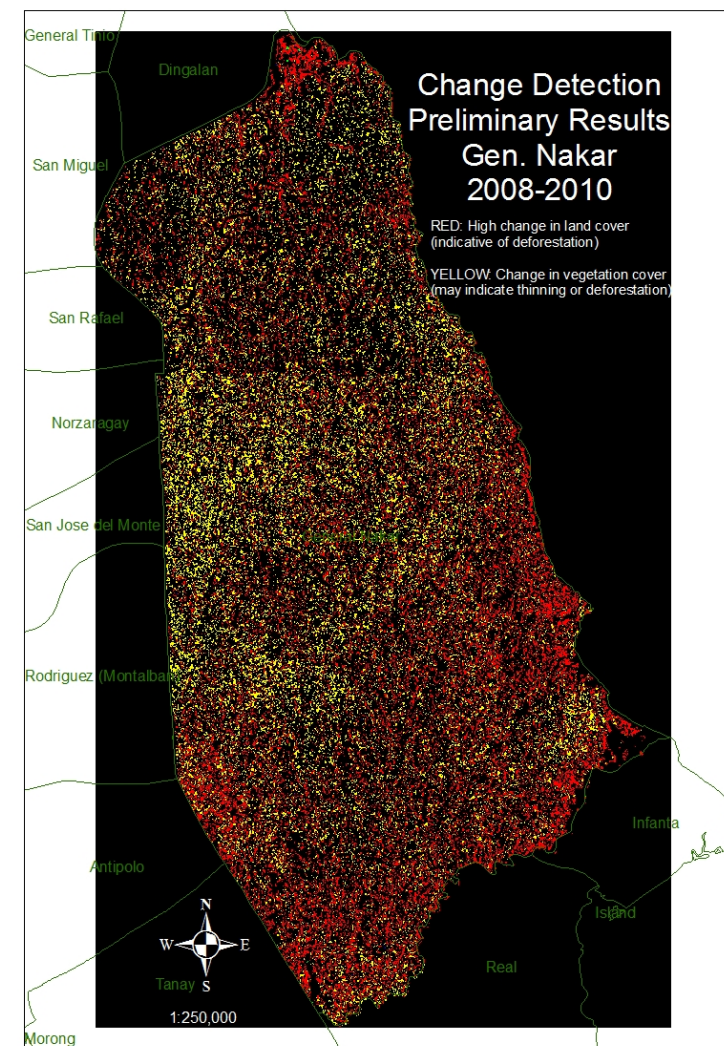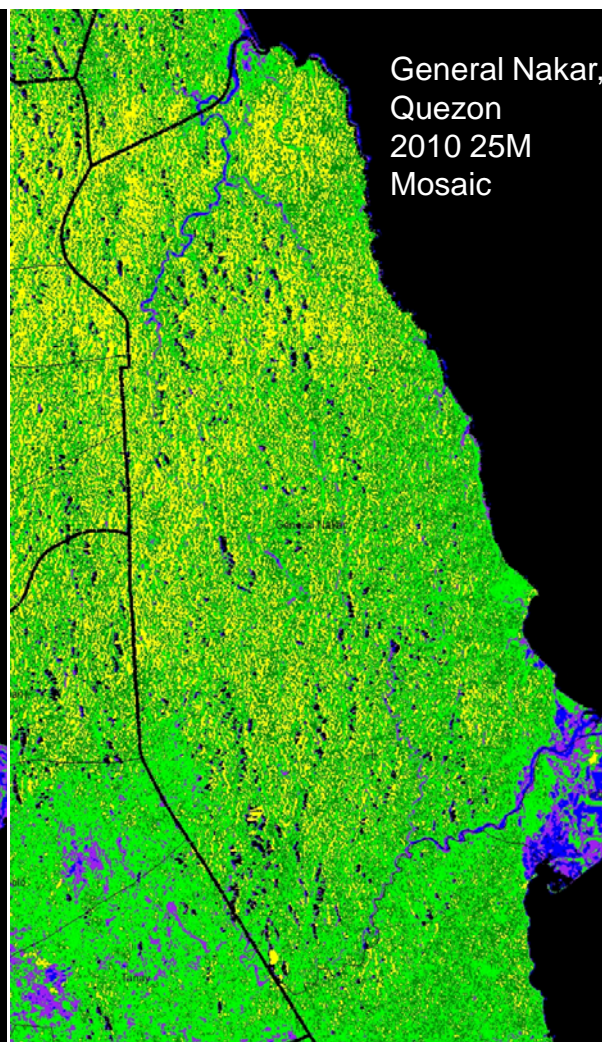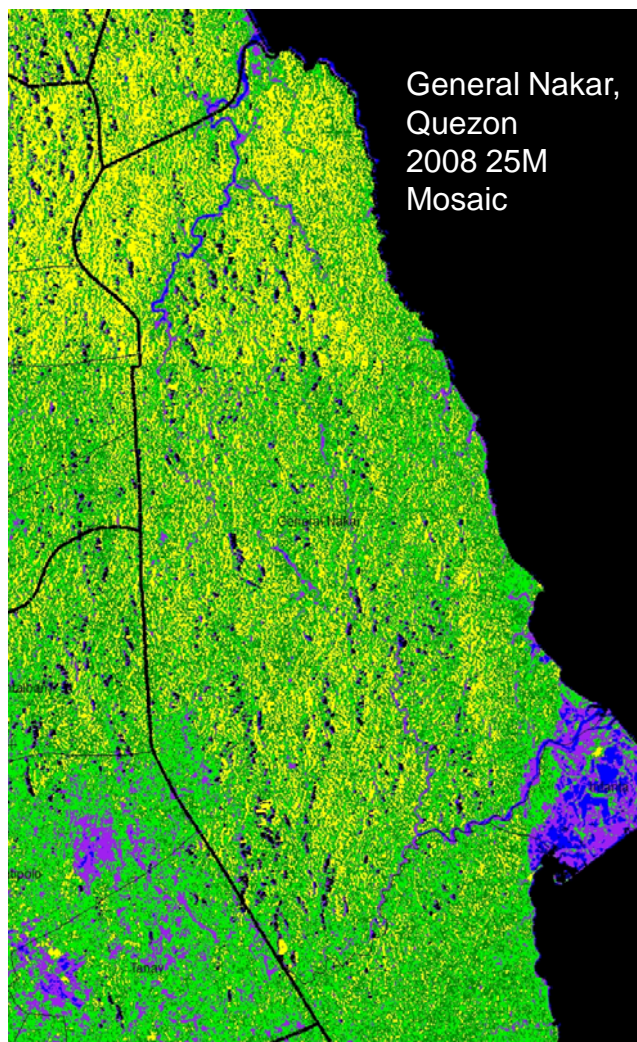
Change Detection Statistics

INITIAL STAGE (2007)

FINAL STAGE (2010)		Class 1	Class 2	Class 3	Row Total	Class Total
	Unclassified	616.938	457.250	531.000	1605.188	881790.875
	Class 1	52871.313	10397.375	222.813	63491.500	64349.000
	Class 2	14668.375	129706.938	28530.063	172905.375	173357.563
	Class 3	100.688	23690.188	81302.688	105093.563	105382.125
	Class Total	68257.313	164251.750	110586.563	0.000	0.000
	Class Changes	15386.000	34544.813	29283.875	0.000	0.000
	Image Difference	-3908.313	9105.813	-5204.438	0.000	0.000

Legend:

Class 1 >> non-forest (includes built-up areas, agriculture, fishpond, etc.)

Class 2 >> vegetation/forest (may include mangrove forest, lowland forests, etc)

Class 3 >> forest (includes dense vegetation/forest area on higher elevations, etc)

ALOS

K&C Initiative
An international science collaboration led by JAXA

General Nakar,
Quezon
2008 25M
Mosaic

General Nakar,
Quezon
2010 25M
Mosaic

Change Detection
Preliminary Results
Gen. Nakar
2008-2010

RED: High change in land cover
(indicative of deforestation)

YELLOW: Change in vegetation cover
(may indicate thinning or deforestation)

General Tinio
Dingalan
San Miguel
San Rafael
Norzaragay
San Jose del Monte
Rodriguez (Montalban)
Antipolo
Infanta
Island
Tanay
Real
Morong

1:250,000

Updates

VANUATU ISLANDS

Climate protection through Forest Conservation in Pacific Island Countries (Vanuatu)

- SPC/GIZ Project and Vanuatu Department of Forestry
- Status for provision of forest inventory raw data from Vanuatu for ground truthing:
- The forest inventory will be conducted on the islands of Santo, Malekula, Efate, and Erromango, a 5th island is possible. This covers most of Vanuatu's land mass;
- For more coverage, additional funding is necessary;
- The inventory pre-test is currently being conducted on Santo, until end of October 2012;
- The roll-out on Santo will be tendered and is expected to be completed next year;
- The other islands will be covered in parallel. The inventory is expected to be completed latest by end of 2014.

Next steps

Leyte

- Classification using object-based approach (on-going)
- Accuracy assessment of classification results
- Derive biomass maps

Southern Sierra Madre & Palawan

- Conduct forest inventories, gathering of ground truth points (1st half 2013)
- Image classification, change detection, and accuracy assessment

Vanuatu

- Conduct forest inventories (2013)
- Image processing

Thank you!