GEO FCT activities in INDONESIA
Progress and Plans

KUSTIYO

Indonesian National Institute of Aeronautics and Space (LAPAN)

MRV Joint Workshop
22-24 June 2010, Guadalajara, Jalisco Mexico

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INCAS

- **Indonesia's National Carbon Accounting System (INCAS)** is the IAFCP program to support Indonesia to provide **significant and cost effective reduction in greenhouse gas emission** in Indonesia by reducing deforestation, encouraging reforestation and promoting sustainable forest management.

- INCAS will be **modeled off Australia's NCAS but tailored to Indonesia's unique circumstances**.

- INCAS will be **a highly integrated system** that will compile information from Indonesia's forestry and agricultural to provide a robust emissions profile from:
  - Remotely sensed land cover change (Activity factors)
  - Climate and soil data
  - Growth and biomass data (Emission factors)

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Collaborative efforts involved in INCAS:

- National Institute of Aeronautics and Space (LAPAN)

- Min. of Forestry (MENHUT)

- National Coordinating Agency for Survey and Mapping (BAKOSURTANAL)

- Indonesia Australia Forest Carbon Partnership (IAFCP)

- Australian Department of Climate Change (DCC)

- Geosciences Australia (GA)

- Australian Commonwealth Scientific and Research Organization (CSIRO)

- South Dakota State University (SDSU) - USA

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INCAS Land Cover Change Monitoring

- **Objectives:**
  - To provide long-term monitoring of land cover change commencing from 1990s.
  - To provide a multi-temporal, fine-resolution data series identifying through time, for any land unit, land cover change (removal of forest cover and forest regrowth) that is attributable to direct human actions.

- **Period:**
  - Feb 2009: Kick-off meeting in Bali
  - Mar – Jun 2009: LCC Preparation phase
  - Jul 2009 – Dec 2010: LCC Processing phase

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LCC Monitoring - Preparation Phase

- **Schedule:**
  - Mar 2009: Scene selection training (at LAPAN)
  - Jun 2009: Software and documentation preparation
- **Infrastructure, Hardware, and Software:**
  - Dedicated processing room
  - Servers and 10TB NAS
  - Networking
  - Software licenses
  - CSIRO soft. for INCAS processing
  - 10 workstations networked to Server

- **Data:**
  Primary data: Landsat (1998-2008) obtained from GA, GITSDA, USGS, and LAPAN's archive

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LCC Monitoring – Processing Phase

- **Objective:**

  To process a time series of Landsat data (1998-2008) to produce accurate change products at 25m for Indonesia (national scale)

- **Expected Outputs:**
  - Processed data:
    - Standards
    - Archiving
  - Capacity Building:
    - Image Processing skills
   - Quality Assurance (QA) skills
  - Documentation

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LCC Monitoring – Processing Phase

- **Training :**
  - Jun -Jul 2009: Image rectification and correction training and processing (by CSIRO, at LAPAN)
  - Aug 2009: Multitemporal Landsat data processing for forest cover change analysis in Indonesia training (by SDSU, at LAPAN)
  - Sept 2009: QA training (at CSIRO)
  - Dec 2009 – Jan 2010: Tests with INCAS images in SDSU (CSIRO-SDSU)
  - Dec 2009: Cloud masking training (by SDSU, at LAPAN)
  - Feb 2010: Orthorectification refresher and illumination terrain correction training (by CSIRO, at LAPAN)
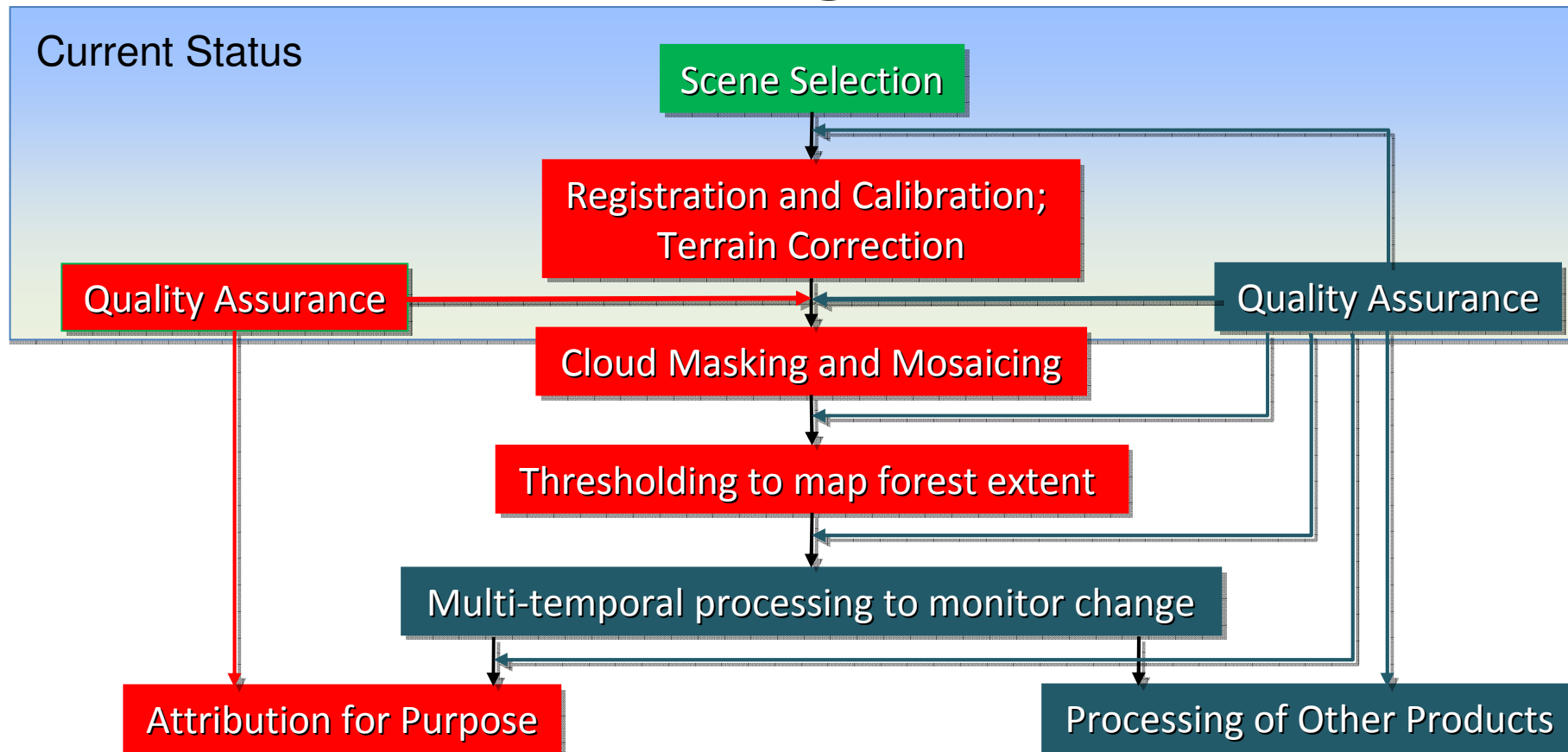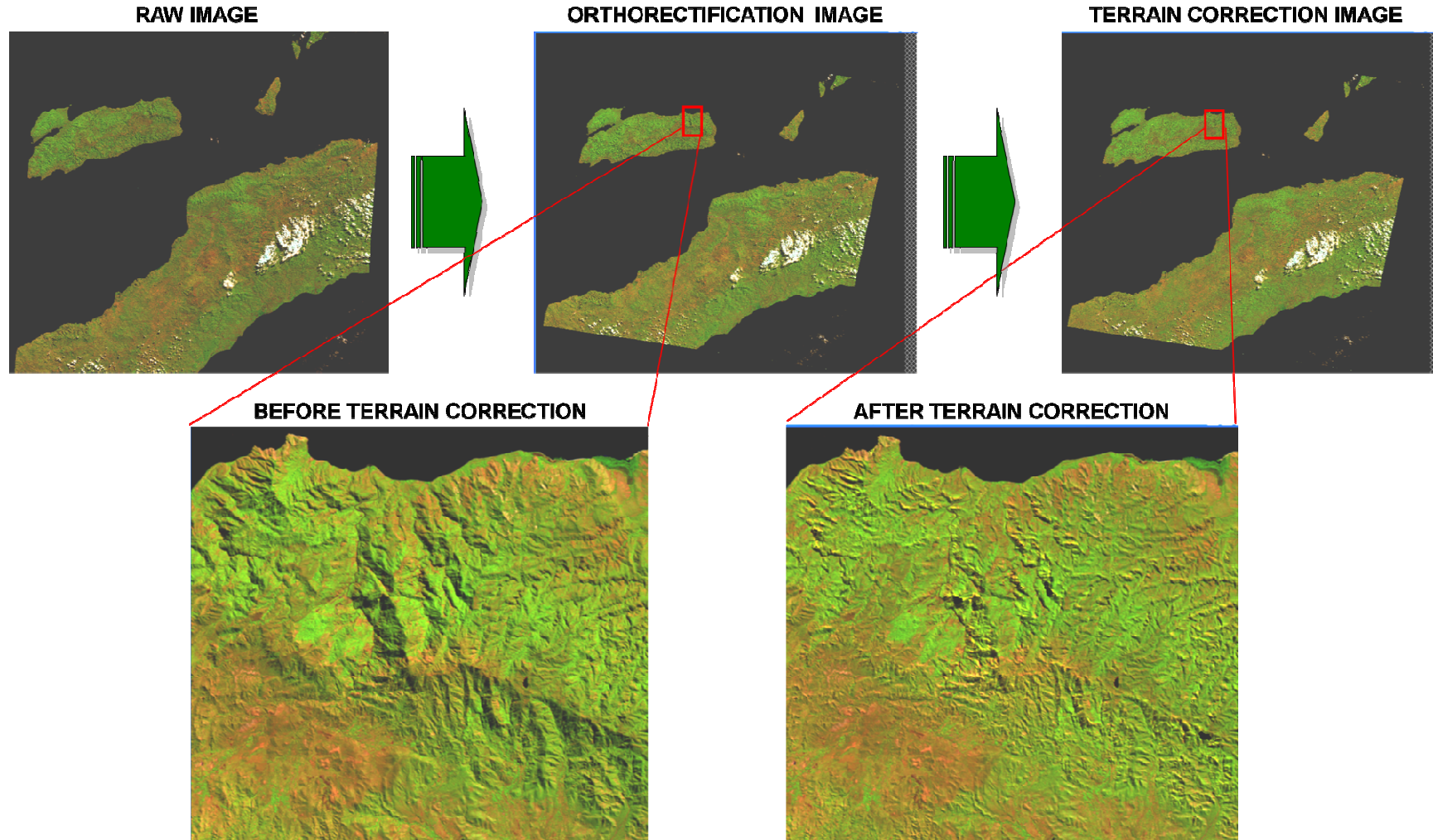
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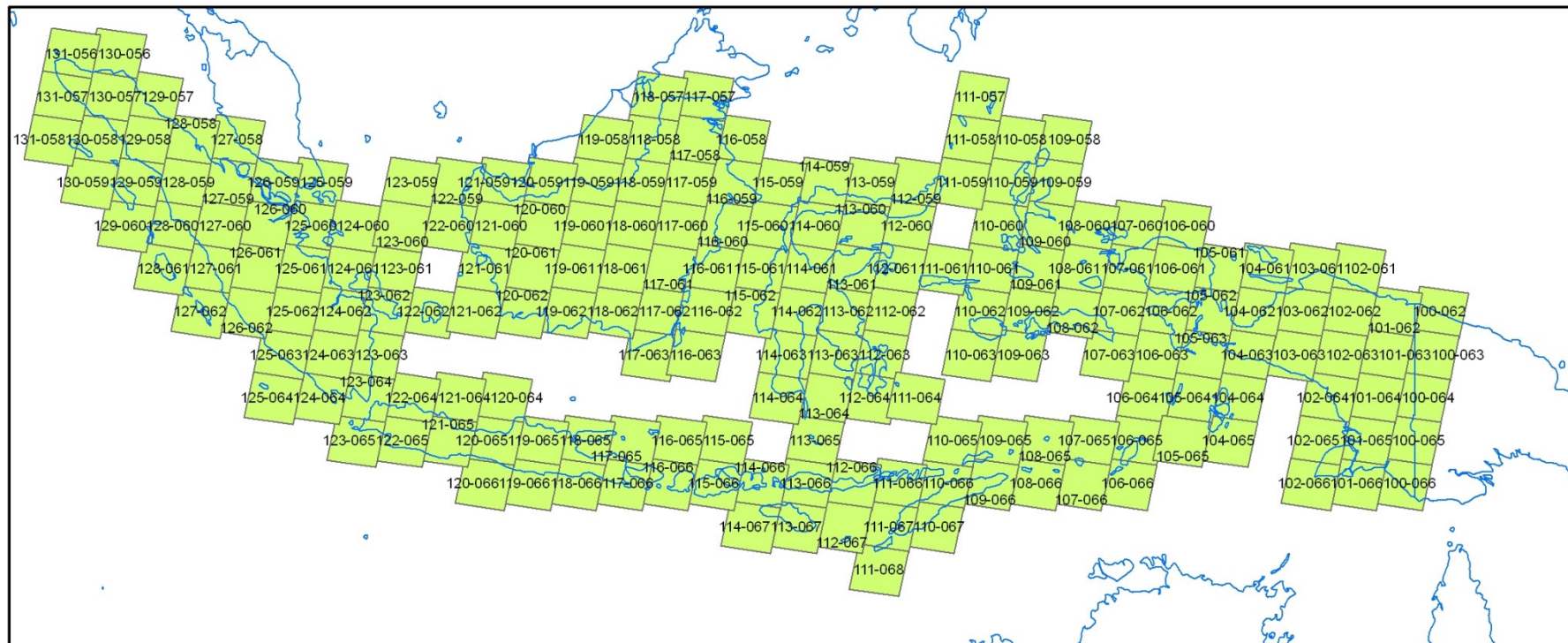
LCC Processing Stream

Examples of Processed Data

Landsat Coverage and Sources

Landsat path-row coverage over Indonesia

Landsat data sources:
- Geosciences Australia (GA)
- GISTDA (Thailand)
- USGS
- LAPAN

Stage 1:
- Year 1998-2008
- 400 scenes/year

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No. of Landsat Scenes
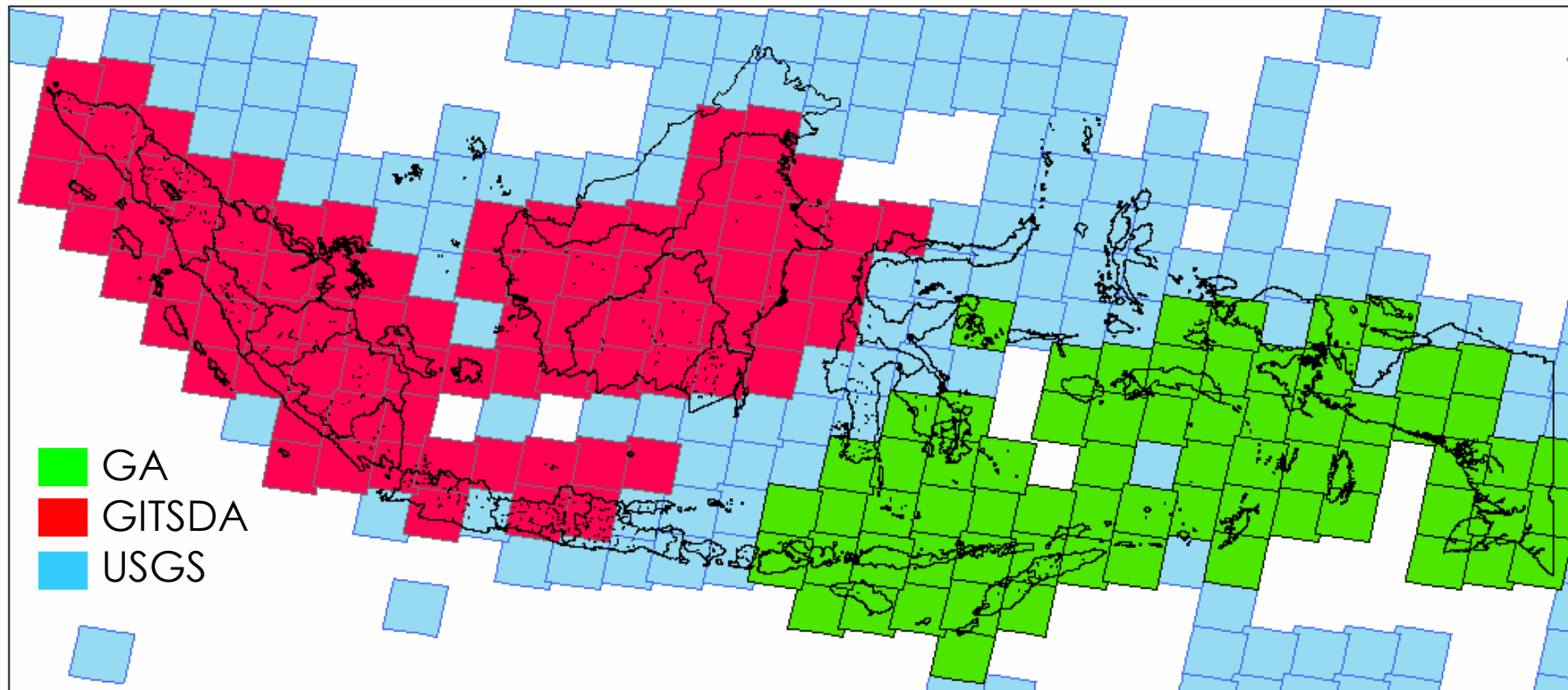
No. of Landsat scenes delivered to INCAS from:

- **Level 1G (Path oriented):**
  - USGS   : 447 scenes
  - GISTDA (Thailand)   : 489 scenes
  - Geosciences Australia : 358 scenes

- **Ortho-rectified (Level 1T):**
  - USGS   : 1367 scenes

Year	Lapan	Non-Lapan	Total
1994	727		727
1995	609		609
1996	735		735
1997	1097	5	1097
1998	614		614
1999	218	63	281
2000	285	209	494
2001	446	231	677
2002	1129	217	1346
2003	649	82	731
2004	1466	207	1673
2005	1334	180	1514
2006	434	552	986
2007	84	63	147
2008		457	457
2008		400	400
	9827	2661	12488

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Landsat Coverage (from GA, GITSDA, USGS)

GA
GITSDA
USGS

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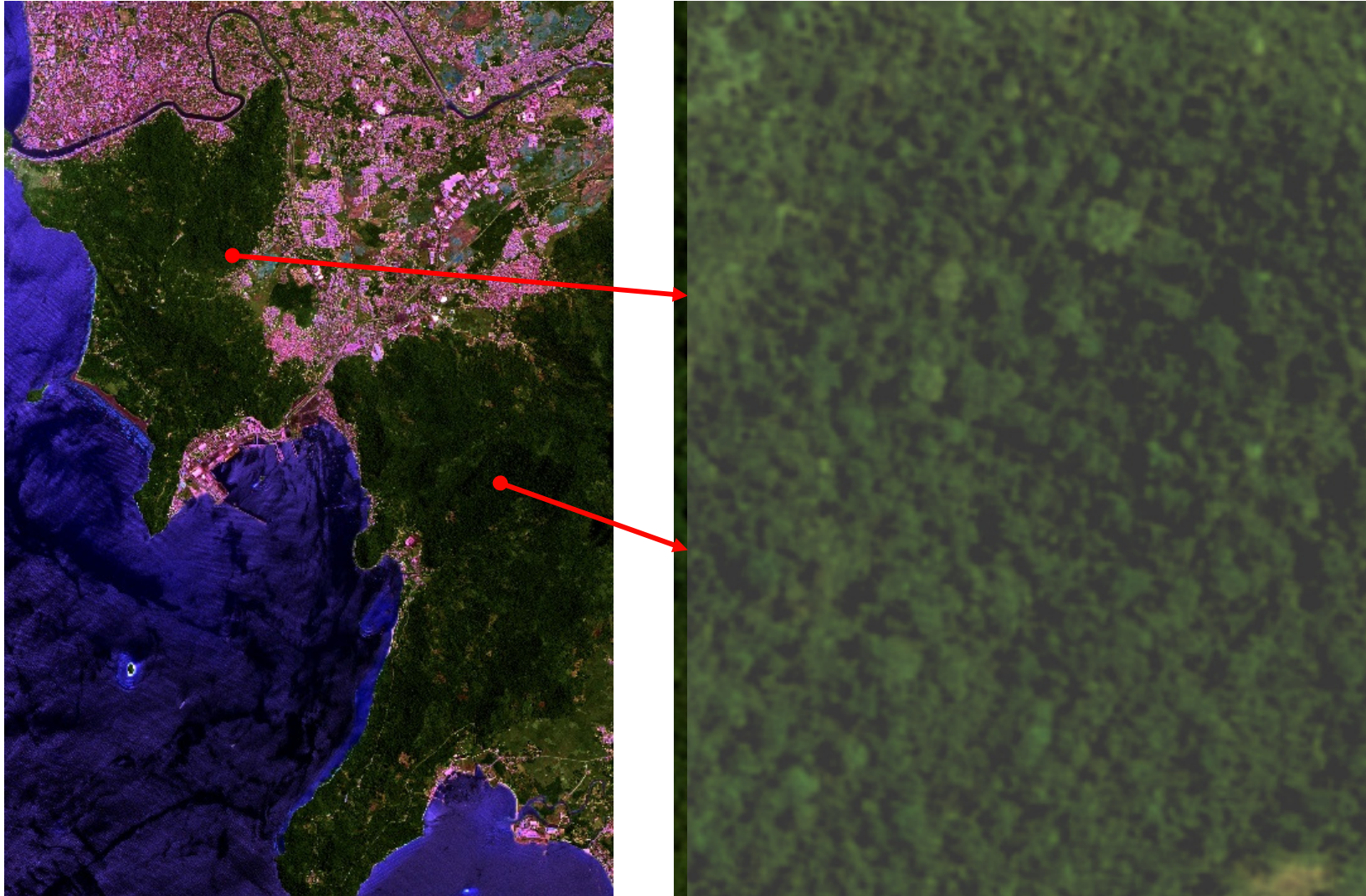Forest Carbon Tracking

The Verification Sites (VS)
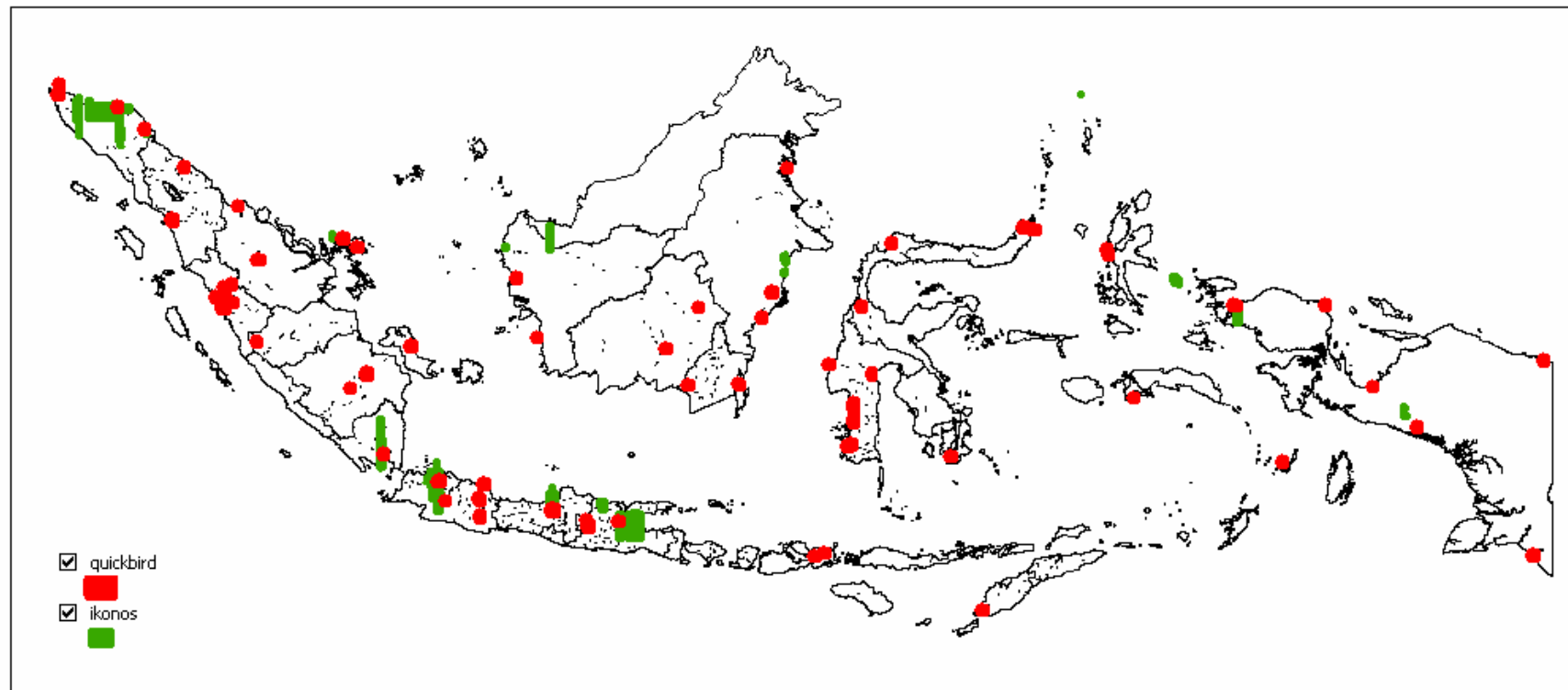# Example Quickbird Data in West Sumatera
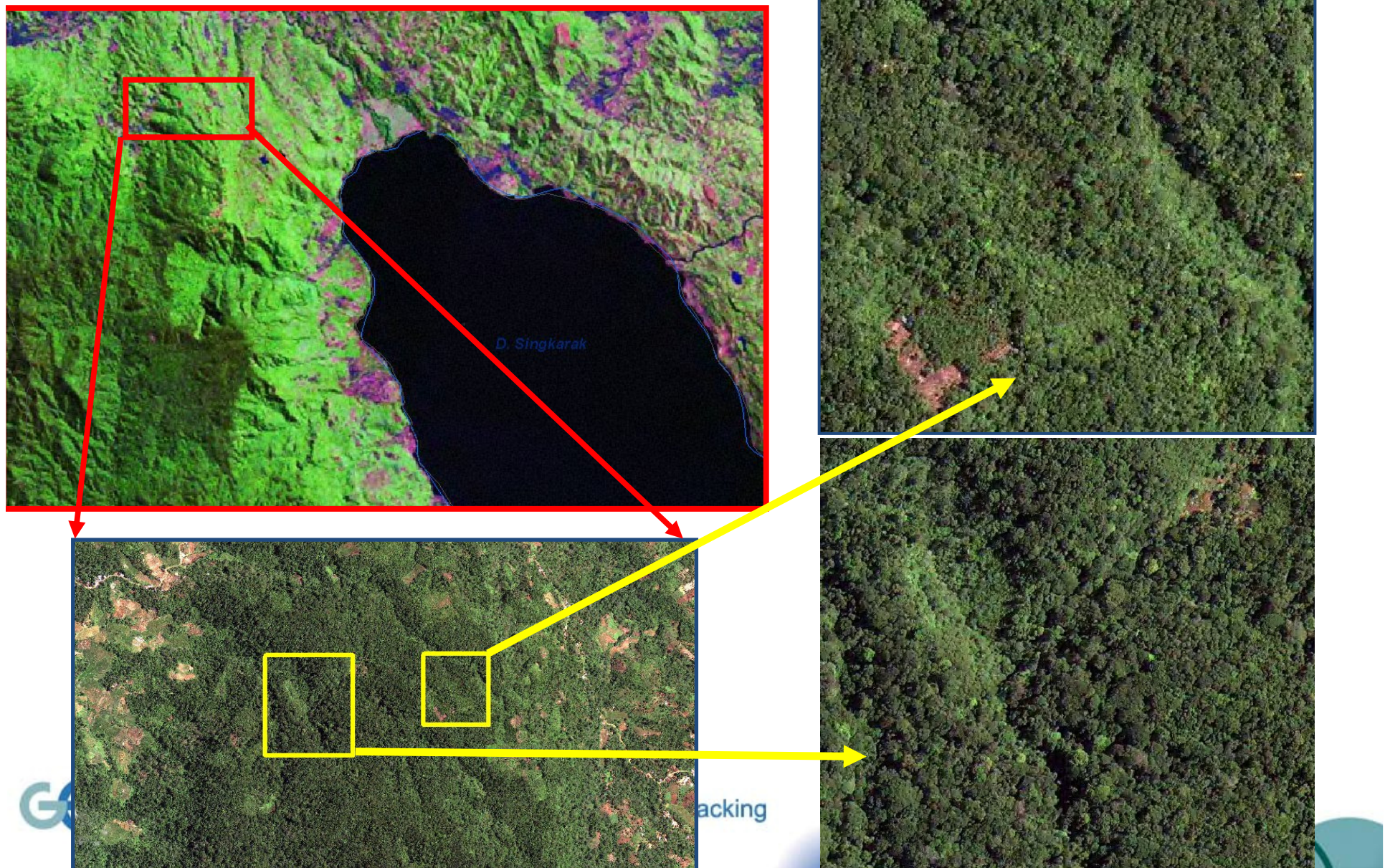
The Verification Sites (VS)
Example of SPOT-5 Data (2.5 m)

IKONOS/QUICKBIRD Data in LAPAN

Future Activities

- **12-23 Juli 2010:** Training on Cloud masking and Mosaiking (Jkt)
  - Priority for Kalimantan and Sumatera
  - New Algorithm for Cloud masking

- **27 Juli – 2 Augt 2010:** Training on Forest Classification (Perth)
  - Multi-temporal classification
  - Production system and capacity
  - Forest change maps
  - Ground data: MoF experts and participation

- Producing the Forest Classification map and verification (priority for Kalimantan)

- We hope, we can get more data likes RADAR Data

Thank You
for Your Attention

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