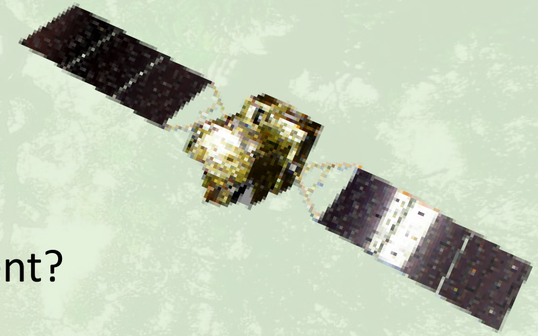
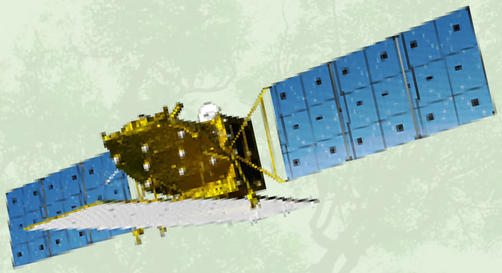
UNFCCC COP 27 Japan Pavilion Seminar
How can satellites improve Forest Monitoring and Management?



Panel Discussion

Dr. Belinda Arunarwati Margono
Director of Forest Resources Inventory and Monitoring,
Ministry of Environment and Forestry,
Government of Indonesia



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National Forest Monitoring System of Indonesia (SIMONTANA)

Belinda A. Margono, PhD
Ministry of Environment and Forestry
DG of Forestry Planning and Environmental Governance

COP 27 UNFCCC | Sharm El-Sheikh, EGYPT
10 November 2022

STRONGER CLIMATE ACTION TOGETHER

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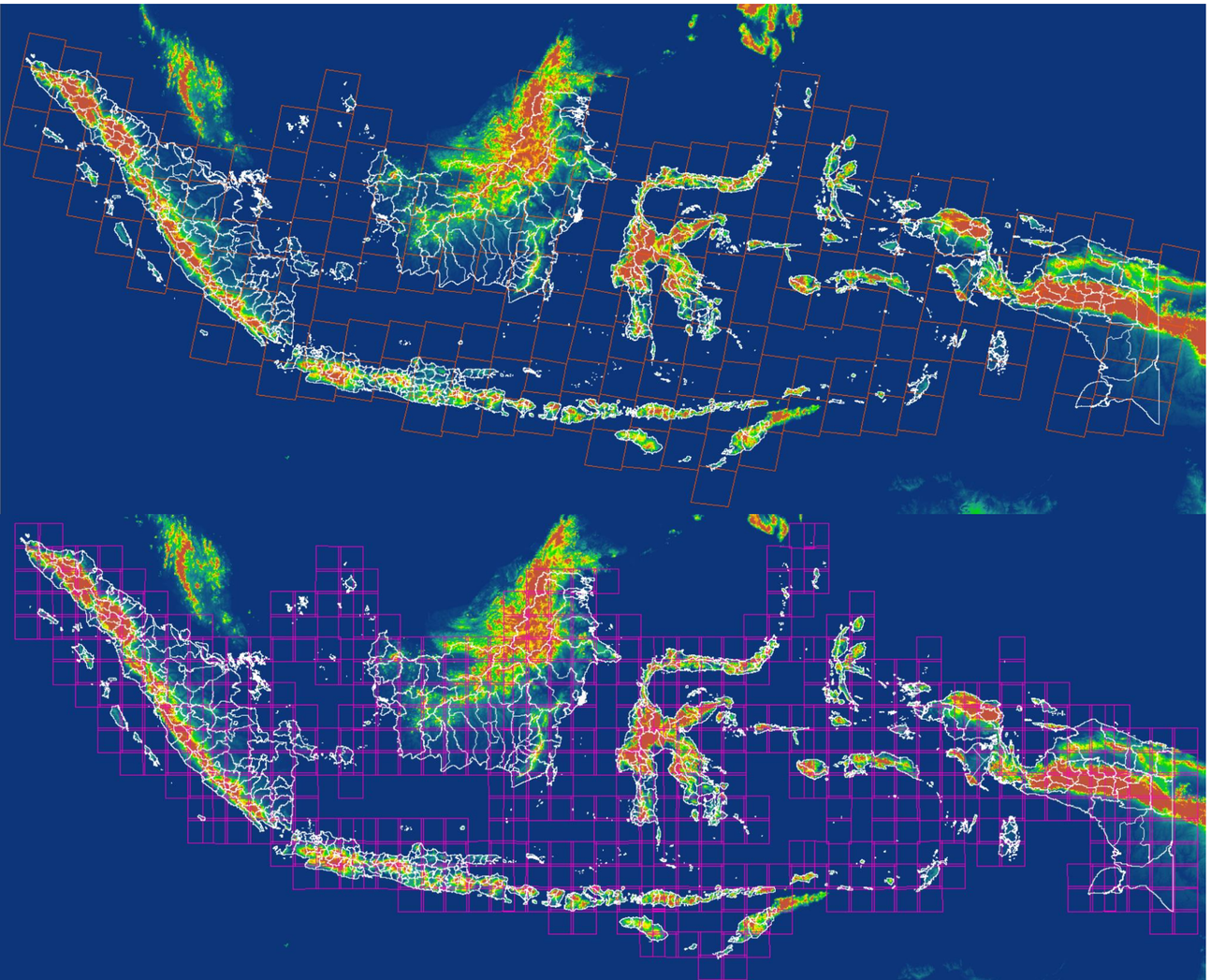
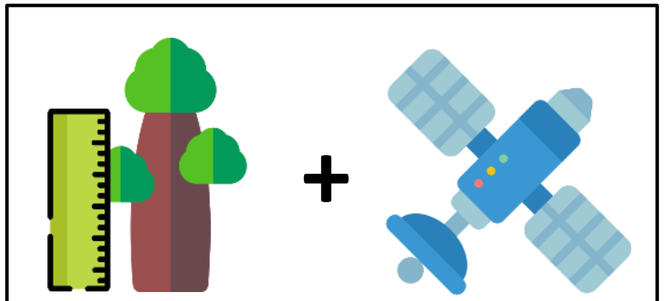
How Big Indonesia Is & How to monitor it?



208 Scenes of Landsat Images

1.919.000 km^2



Terrestrial + Remote Sensing

556 Scenes of Sentinel 2A Images

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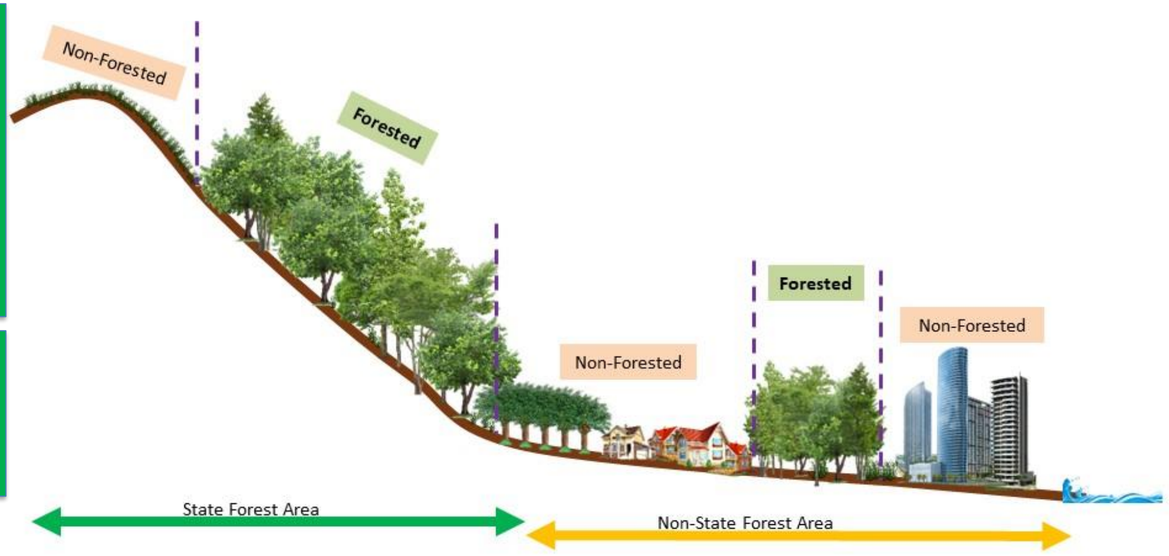
THE INDONESIAN FOREST
(Indonesian Perspective as stipulated hereto the Law Nr 41 of 1999 on Forestry)

FOREST
(Physical Definition)

A landscape-based ecosystem unit occupied by tree dominated bio-natural resources enclosed in environmental unity, in which one to another is inextricable

Land Cover
- Forested (Dryland, Swamp, Mangrove)
- Non forested



STATE FOREST AREA
(Legal Definition)

A specific area appointed and/or enacted by the government to maintain the existence of permanent forest.

State Forest Area
- Conservation Forest
- Protection Forest
- Production Forest (Standard, Limited, Convertible)
- Non-State Forest Area

THE INDONESIAN FOREST(2021)

	State Forest Area	Non-State Forest Area	∑
Forested	46.8%	4.0%	50.8%
Non Forested	16.3%	32.9%	49.2%
∑	63.1%	36.9%	100%

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FOREST RESOURCE MONTORING INSTRUMENT

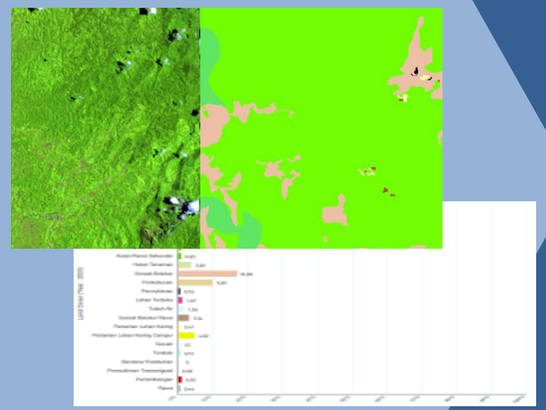
SIMONTANA

what to be monitored?

01

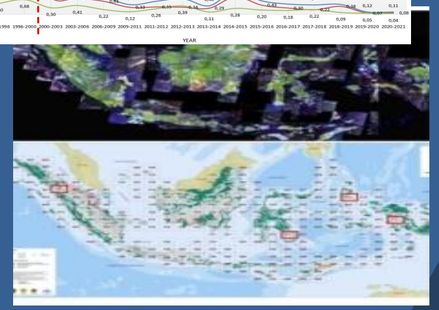
- Standing stock (timber & NFTP)
- Forest accounting
- Biomass

02



- Land Cover
- Forest cover

03



- LC change
- Deforestation

04

- De-vegetation
- *Deforestation Alert Syste*

Existing (Continuous) System and Data Establishment

- The system is operational & inherent with the MoEF of Indonesia- organizational structure
- Not project based
- Guarantee the continuity of system operation
- Modalities for various needs, including implementation of REDD+

https://nfms.menlhk.go.id/
https://sigap.menlhk.go.id/

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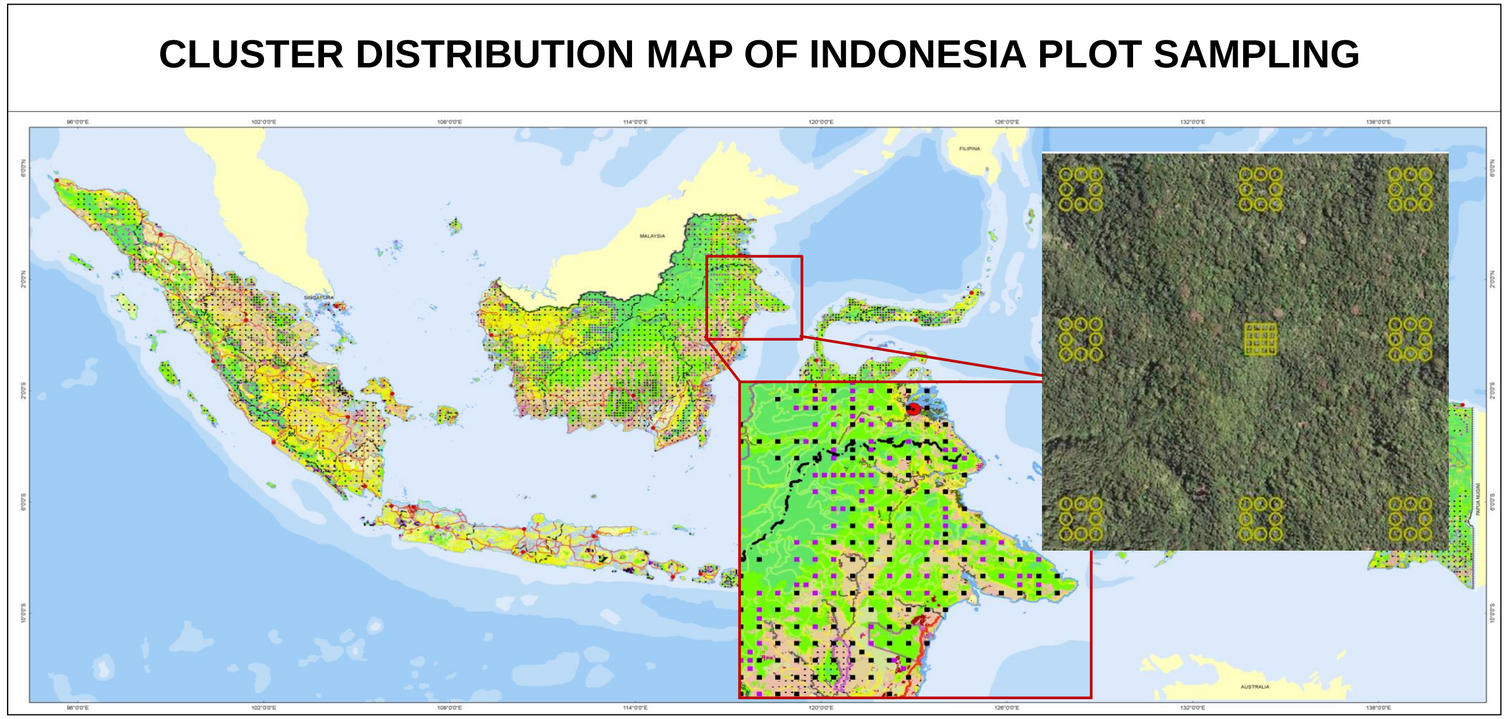
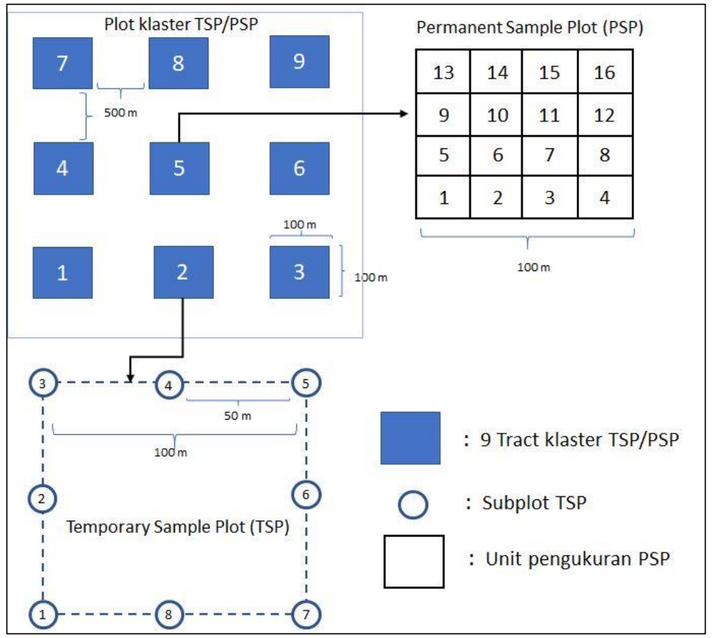
Terrestrial Measurement





- **Focus**: Forested land on The State Forest Area
- **Cluster** for Temporary Sample Plot and Permanent Sample Plot
- **Design** : Systematic sampling; grid 20kmx20km, on some point detailed 10kmx10km and 5kmx5km

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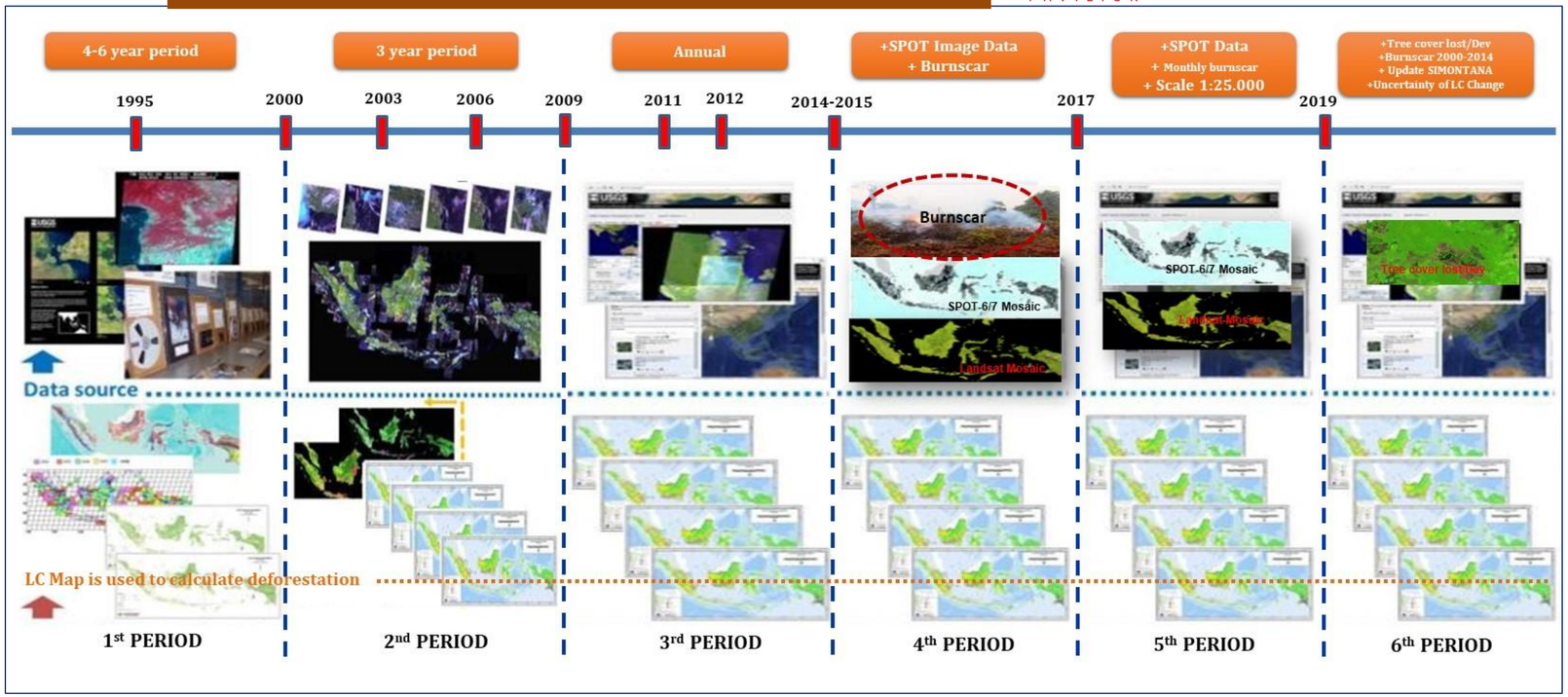
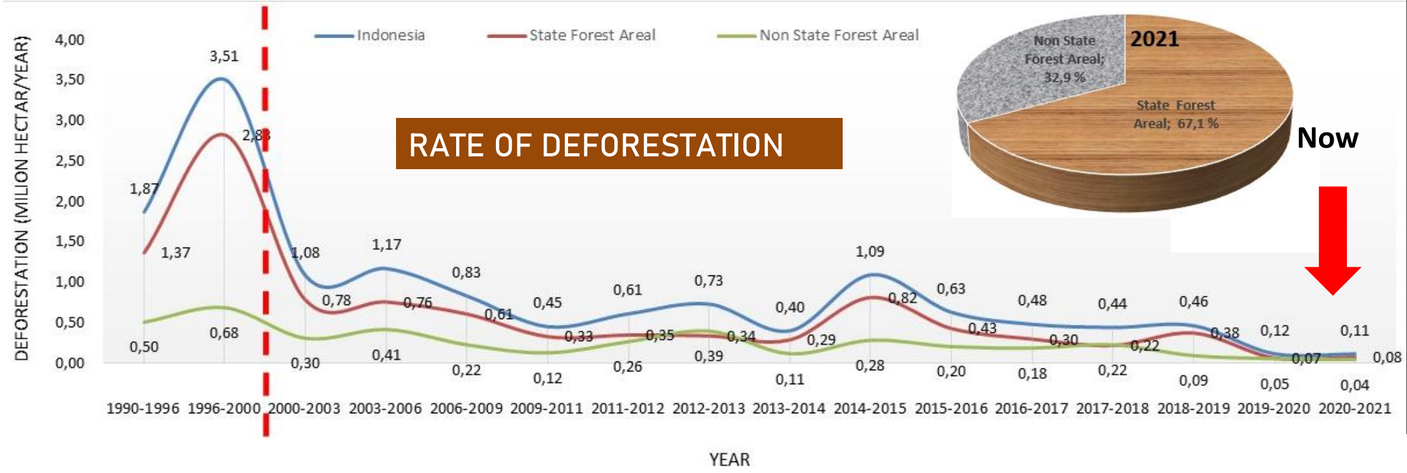
LONG HISTORY OF LAND COVER DATA AND ITS IMPROVEMENT

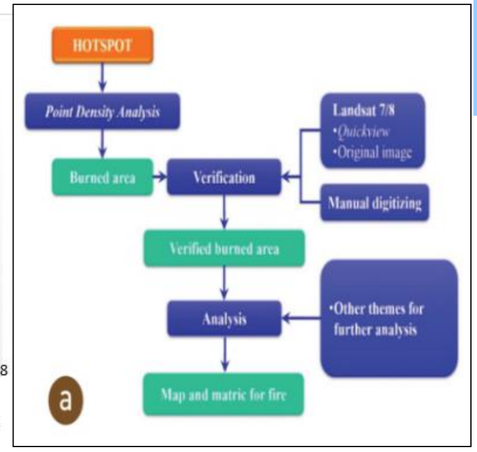


- The **accuracy of land cover map** has also been calculated using *simple random sampling* method (5.000-point samples were distributed across Indonesia; time period: 1990-2000);
- Samples were interpreted using high resolution imagery such as SPOT 6/7 and Google Earth

- ***overall accuracy*** **(2020) 23 classes: 78,9%**
- ***overall accuracy (*****2020) forest-non forest: 94,7%**

Uncertainty of national land cover changes is still processing





- Increase the number of mangrove sample plots;
- Improve accuracy of Above Ground Biomass using allometric of Manuri (2017) and Chave (2014);
- Re-design of the sample plot (on-going).

NATIONAL FOREST INVENTORY

BURNSCAR AREA MAP

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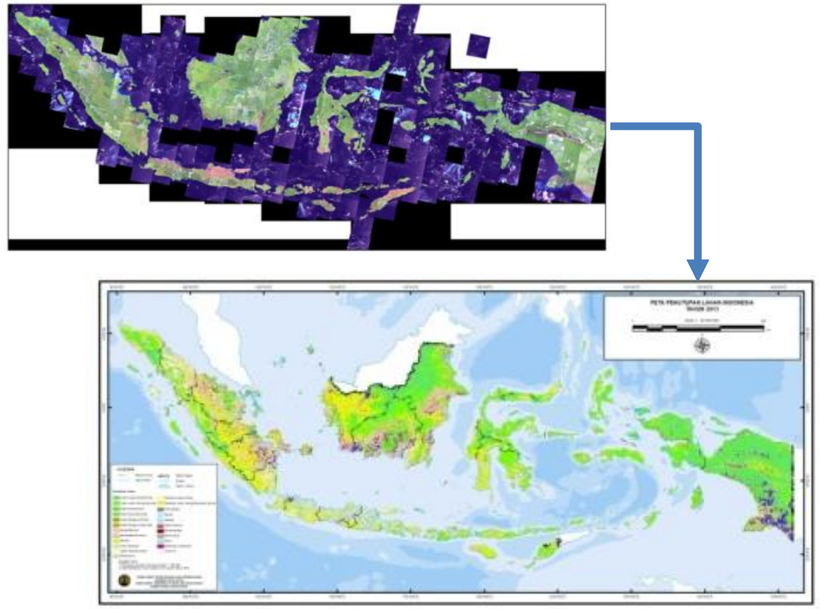
Understanding Indonesian Landcover Classes

No	MoEF Land Cover Classes	IPCC Classes
1	Primary Dryland Forest	Forestland
2	Secondary Dryland Forest	
3	Primary Mangrove Forest	
4	Primary Swamp Forest	
5	Secondary Mangrove Forest	
6	Secondary Swamp Forest	
7	Plantation Forest	
8	Dryland Agriculture	Cropland
9	Mixed Dryland Agriculture	
10	Transmigration	
11	Ricefield	
12	Estate Plantation	
13	Savanna/ Grassland	Grashland
14	Bush/Shrub	
15	Swamp Shrub	Wetland
16	Swamp	
17	Settlement	Settlement
18	Barren Land	Otherland
19	Fish Pond	
20	Airport/ Port	
21	Mining Area	
22	Water Body	
23	Cloud	



Gross Deforestation
= Forestland → Non-forest

Reforestation
= Non-forest → Forestland

Nett Deforestation
= Gross Deforestation – Reforestation

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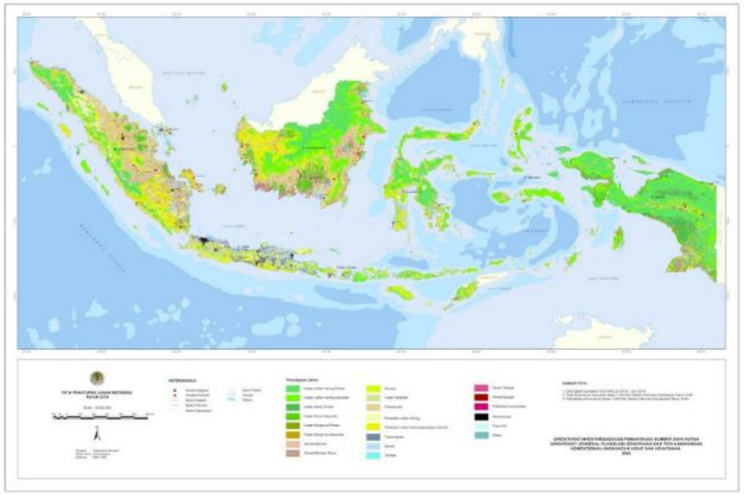
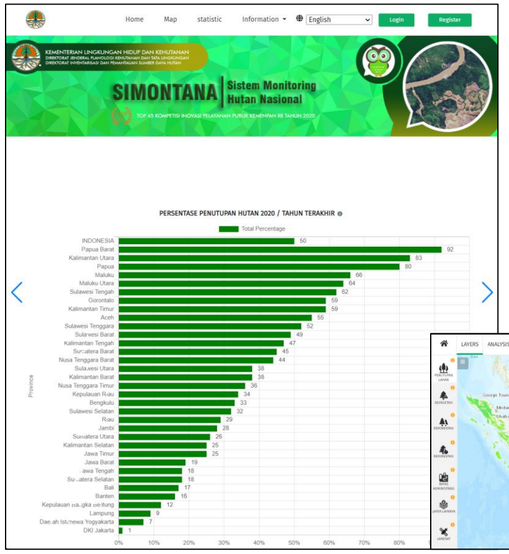
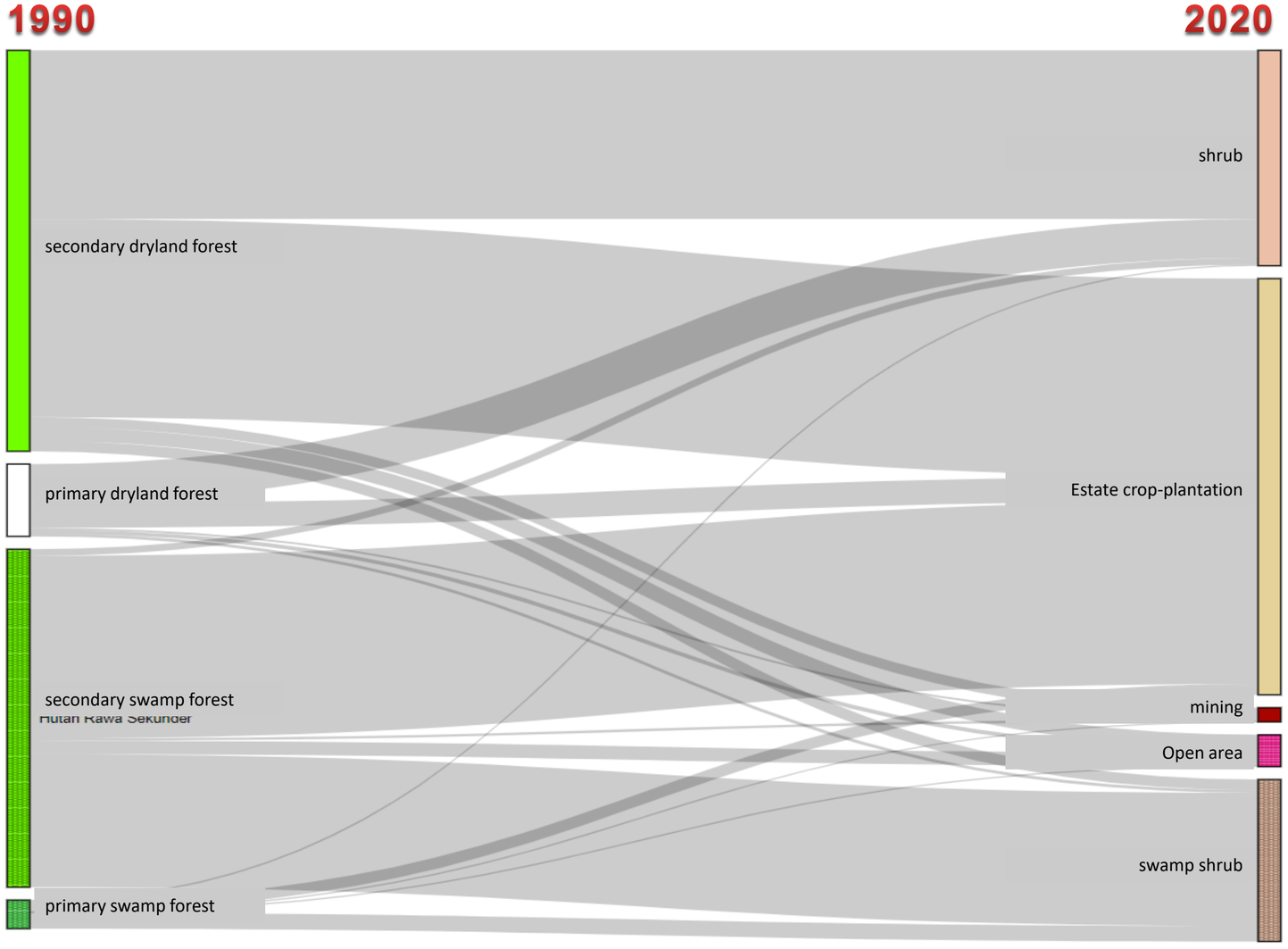
LAND COVER CHANGE TRAJECTORY (example: 1990 – 2020)







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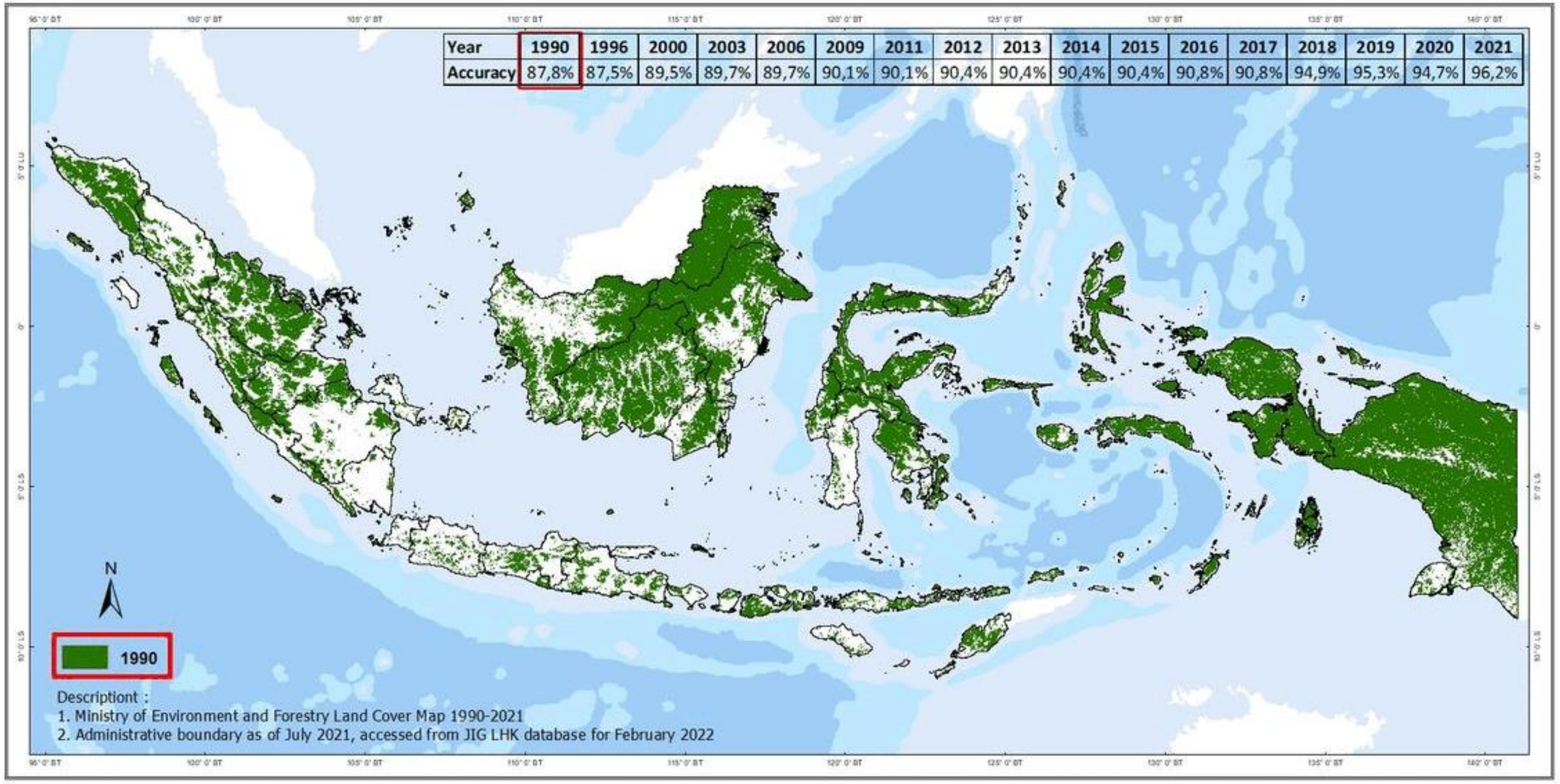
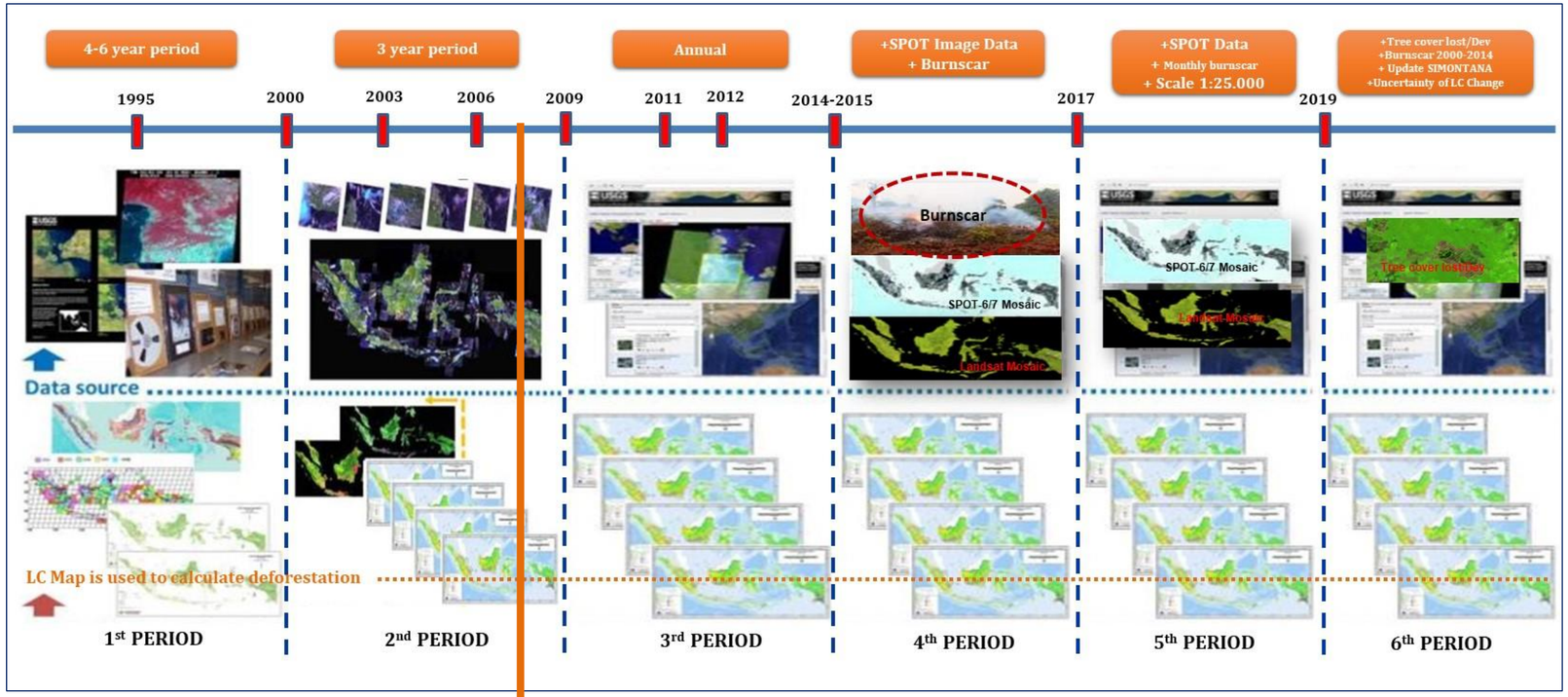
LAND COVER CHANGES OF INDONESIA PERIOD 1990–2021



Notes on Japan Satellite Images

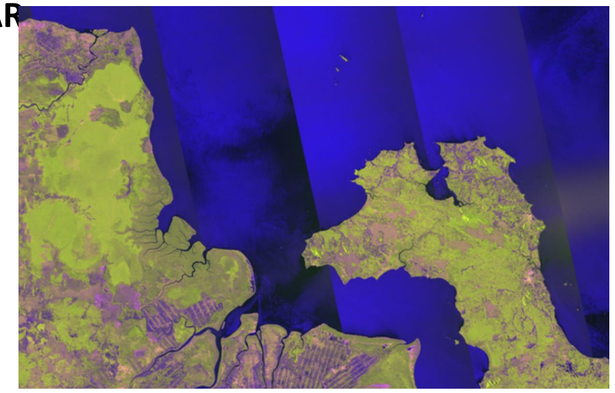


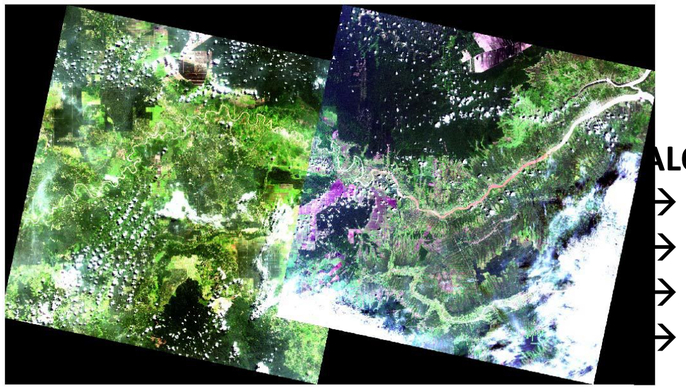
2008-2011

- High resolution image needs
- Landsat 7 ETM SLC Off
- Excessive cloud cover

ALOS PALSAR

→ Radar HH/HV polarization; 50m
→ Assessment for landcover map
→ Visual (RGB)





ALOS AVNIR-2 & PRISM

→ AVNIR-2 (Multispectral) 10m
→ PRISM (Panchromatic) 2,5m
→ Assessment for Forest Resource Potential
→ Estimating timber stock

- Data continuity
- Limited Access
- Competitive price
- Software specific
- Qualified training facilities for new product

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Update:

Participate Online Workshop “Tropical Forest Management Using The JJ-Fast an Alos-2” on 4 - 19 October 2021

Preliminary result : Overestimate for calculating Indonesia Deforestation

THANK YOU

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