

WORLD
RESOURCES
INSTITUTE

*Transparent mapping for low carbon development
strategies & Ecosystem service review*

Low Emission Development Strategies = **REDD+** =
Integrated approach Agriculture-Forestry-Energy

Fred Stolle

World Resources Institute

Overview

1. What is The problem
2. RED → REDD → REDD+ → LEDS
3. Indonesia
4. Huila Prepare for 2050
5. Man Messages



Main Messages

- Deliver REDD via LEDS (DEVELOPMENT)
- Understand, Measure, Monitor, and Manage
 - Current land use
 - Drivers (demand and supply)
 - Stakeholders (use of land and yield)
 - Efficiency
 - Governance
- Key is analyze, measure, plan and enforce
- To be successful NEED to go technical hand-in-hand with Governance reform.



Overview

1. What is The problem
 1. GHG emissions
 2. Deforestation
 3. Theoretical Drivers
 4. Drivers in Huila
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GHG emissions Colombia



United Nations
Climate Change Secretariat

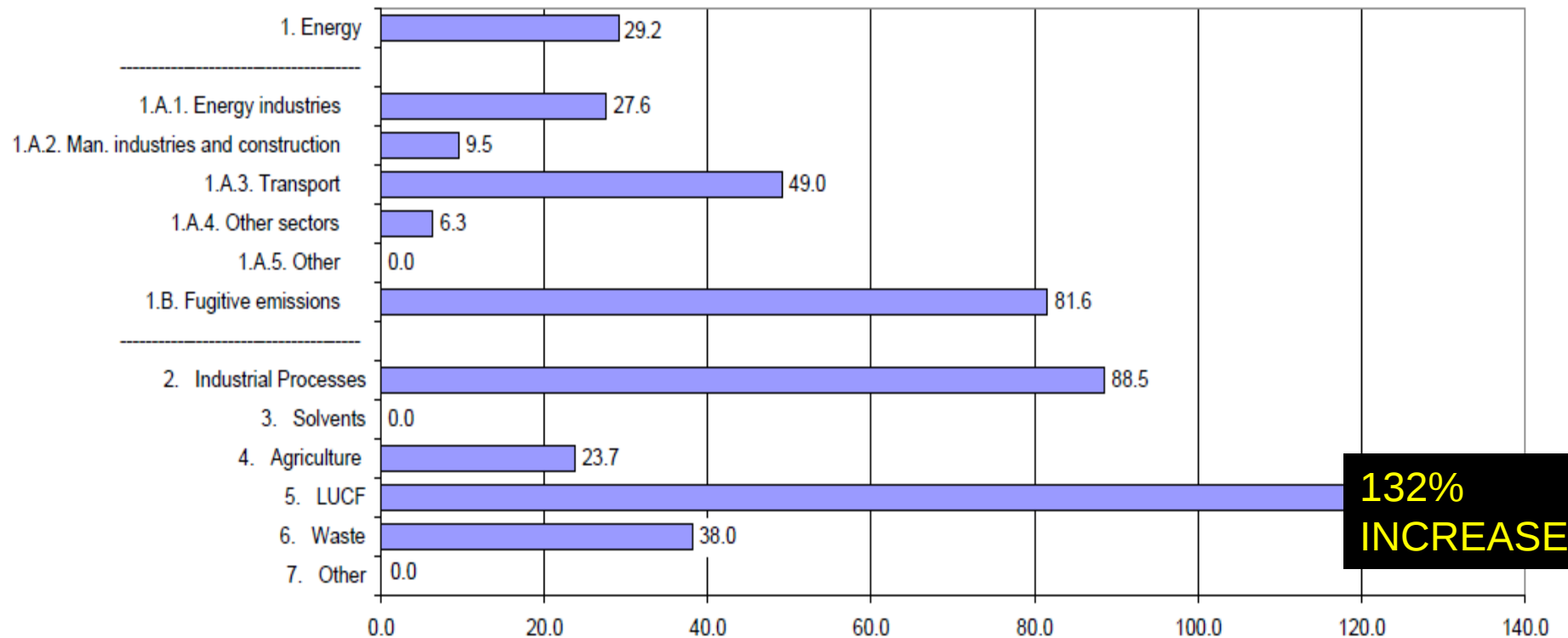
Emissions Summary for Colombia

	Emissions, in Gg CO ₂ equivalent		
	1990	2000	Latest available year (2004)
CO ₂ emissions without LUCF	49,706.5	63,813.8	63,907.3
CO ₂ net emissions/removals by LUCF	10,869.1	29,944.9	25,720.6
	Average annual growth rates, in per cent per year		
	From 1990 to 2000	From 2000 to latest available year (2004)	From 1990 to latest available year (2004)
CO ₂ emissions without LUCF	2.5	0.0	1.8
CO ₂ net emissions/removals by LUCF	10.7	-3.7	6.3



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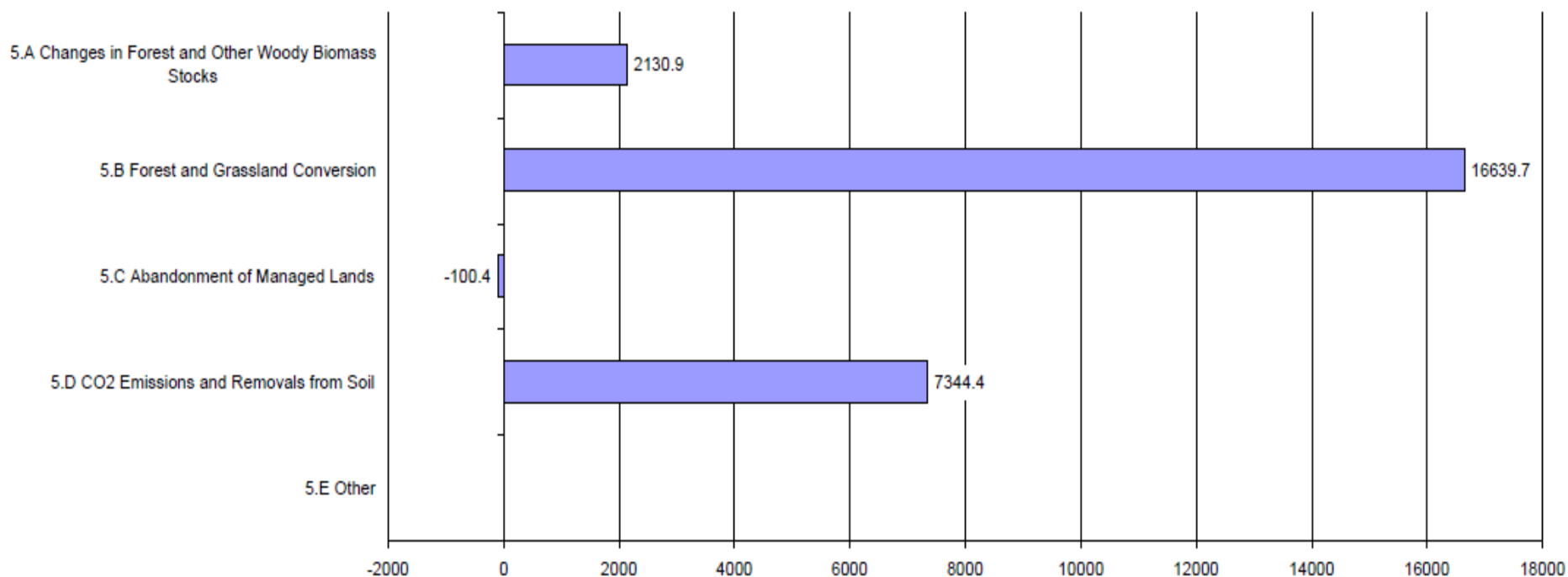
Change in GHG emissions/removals from 1990 to 2004, %



GHG emissions Colombia, forestry and Agricultural sectors

Breakdown of GHG emissions/removals within the LUCF sector, (Gg CO₂ equivalent)

2004





Colombia eyes greenhouse gas cuts through forest protection



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By Marcelo Teixeira

SAO PAULO, June 28 | Thu Jun 28, 2012 2:55pm EDT

(Reuters Point Carbon) - Colombia plans to have in place 10 months from now a new system to measure deforestation, which it hopes will drastically improve its ability to establish a national policy to reduce emissions from deforestation (REDD), the country's environmental minister said.



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Email



Print



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Deforestation

- Manuel Rodriguez Becerra, a professor at Universidad de los Andes and a former Colombian environment minister, said deforestation averaged **350,000 ha/yr** in the last decade.
- Huila: From 2001 to 2007, the deforestation rate was **6,100 ha/yr** of continuous forest per year.



Overview

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 4. Underlying Drivers
 5. Recommendation
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Drivers Huila

- Expansion of the agricultural frontier for crops such as beans, coffee, lulo, mora, granadilla, and pitahaya
- Cattle ranching have been increasing at a pace of 7,000 hectares each year
- Timber extraction. deforestation rate of 10,000 hectares per year
- Mining

**Many impacts on ecosystem services:
rivers, hydropower, erosion, productivity:**

The Ecosystem Service Review

(late more about Eco Sys Rev)



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Underlying Drivers

- Agricultural policies such as credits, incentives, and subsidies, which have promoted production increases in hillside areas adjacent to protected areas and important water resource conservation areas
- Law Enforcement
- lack of governance, and lack of development of productive activities



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RED → REDD → REDD+ → LEDS

- First idea only Deforestation (Montreal)
- Bali added Degradation
- Cancun added + now
- Reduced emission from deforestation and forest degradation and enhance carbon stocks and sustainable management and of forest and forest conservation.



- Many developing countries cannot afford to concentrate on carbon only.
- Do need buy in from local population
- Low Emission **Development** Systems
- Use land to generate income but use it smarter with lower emissions



Overview

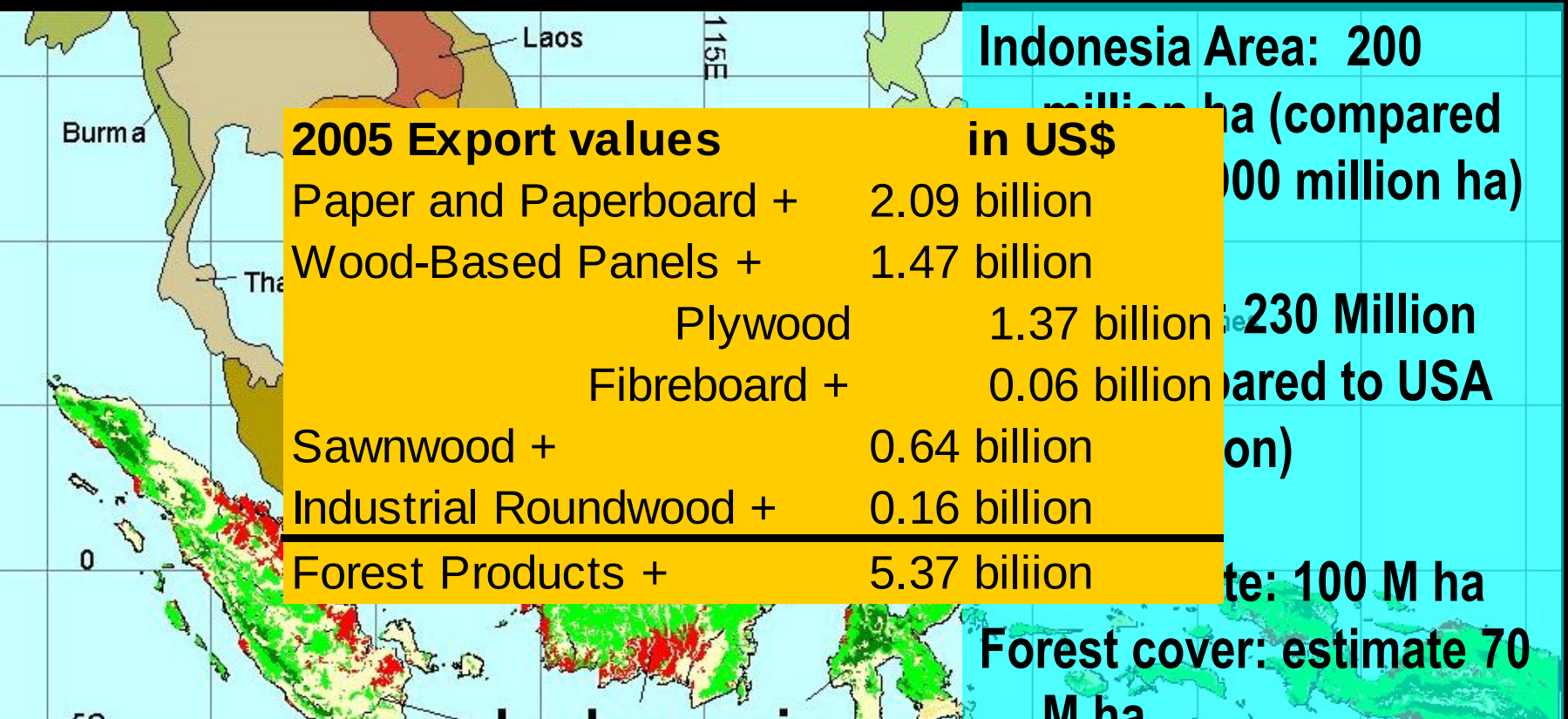
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Measuring drivers of Deforestation and strategies to mitigate drivers in Indonesia





Oil palm export : 20.9 million ton , 7 million ha, approx 10 billion USD (2009)



Forestry and Oil Palm Contribution to GDP

- Contribute around 1 %
- Many people working in the industry







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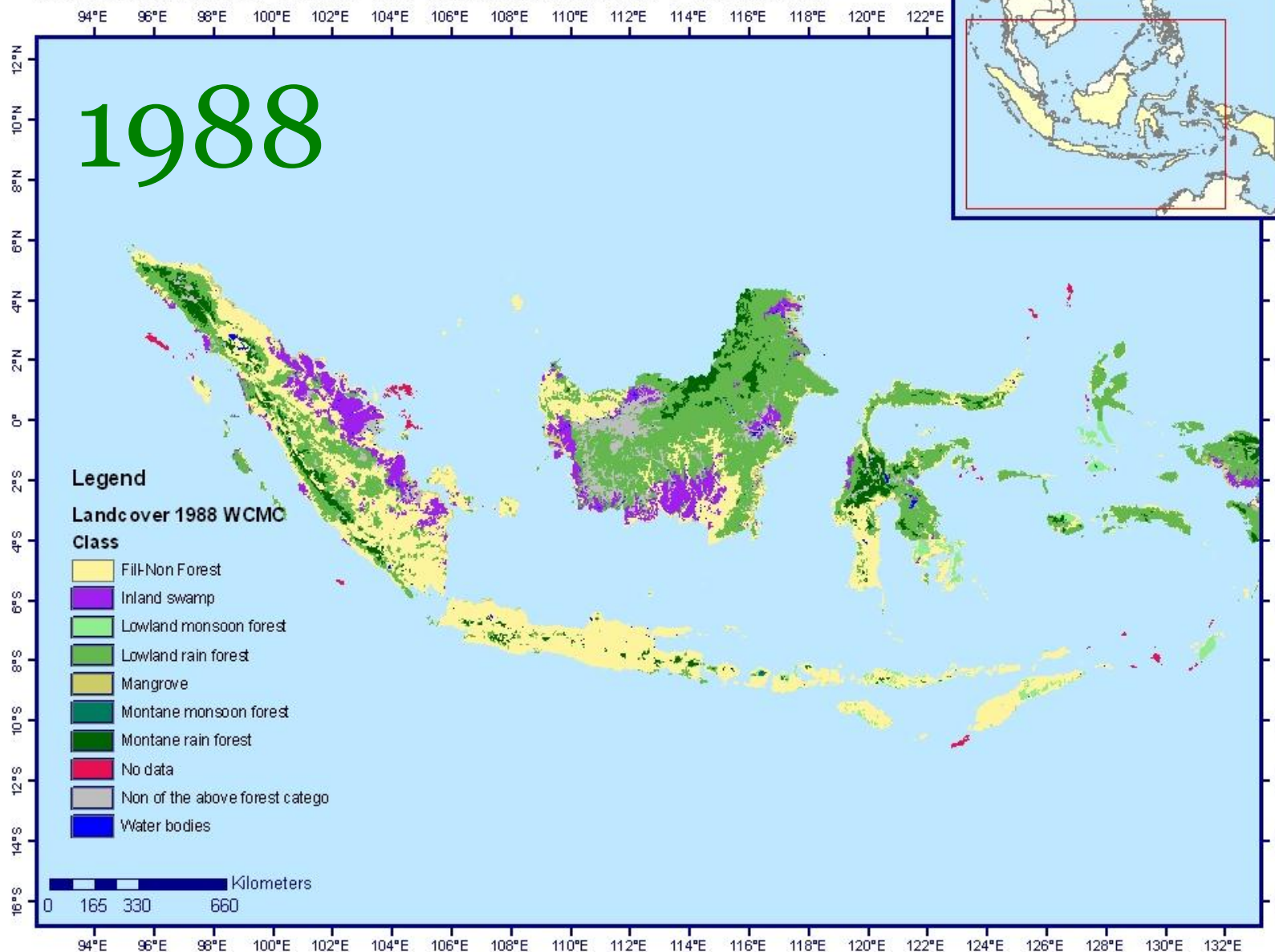
3M

Measure → Monitor → Manage

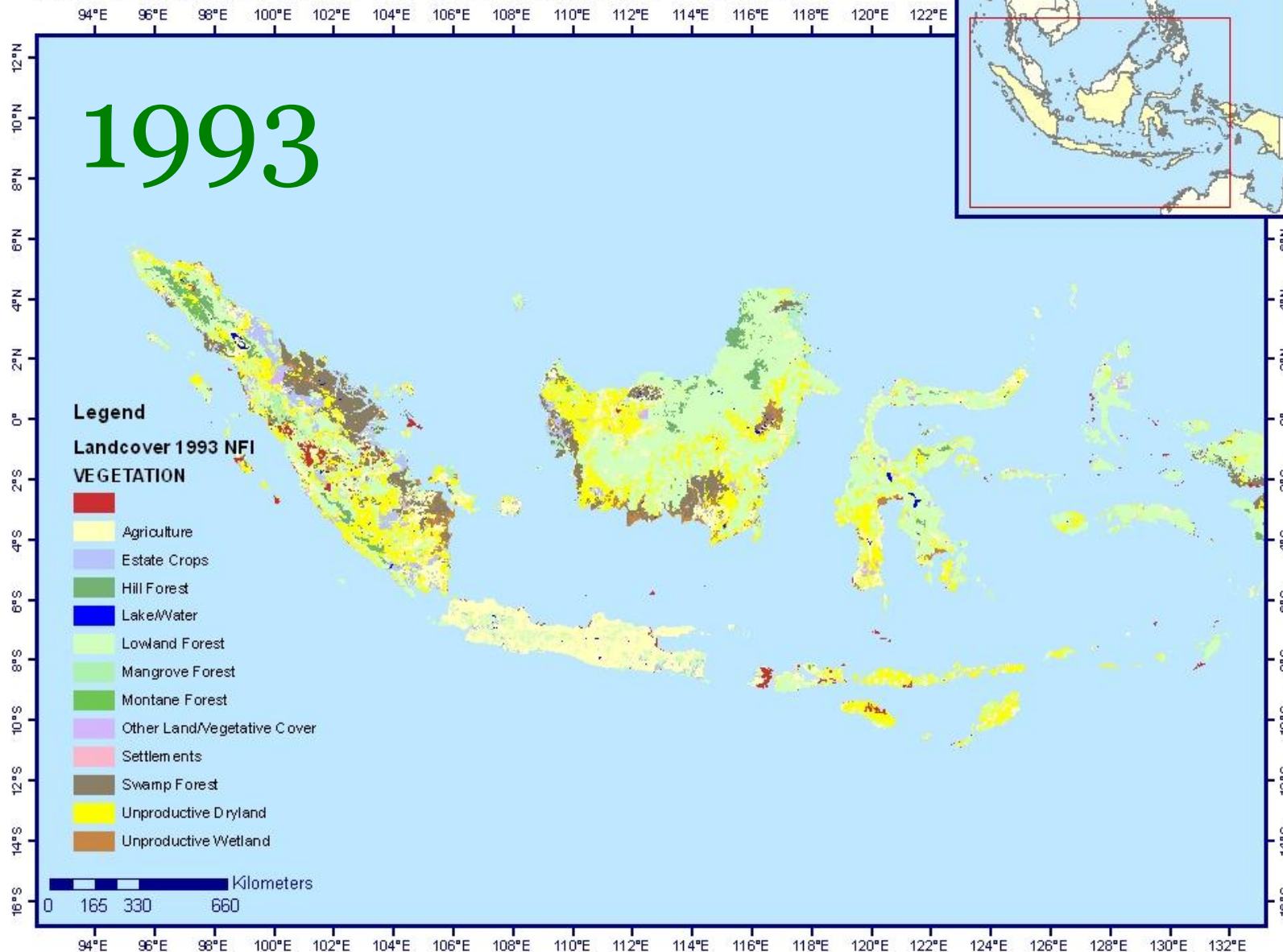
- Ministry of forestry mapped but did not monitor
- No open data access no trust, no verification
- Different ministries worked with different data



Interactive Atlas of Indonesia's Forests



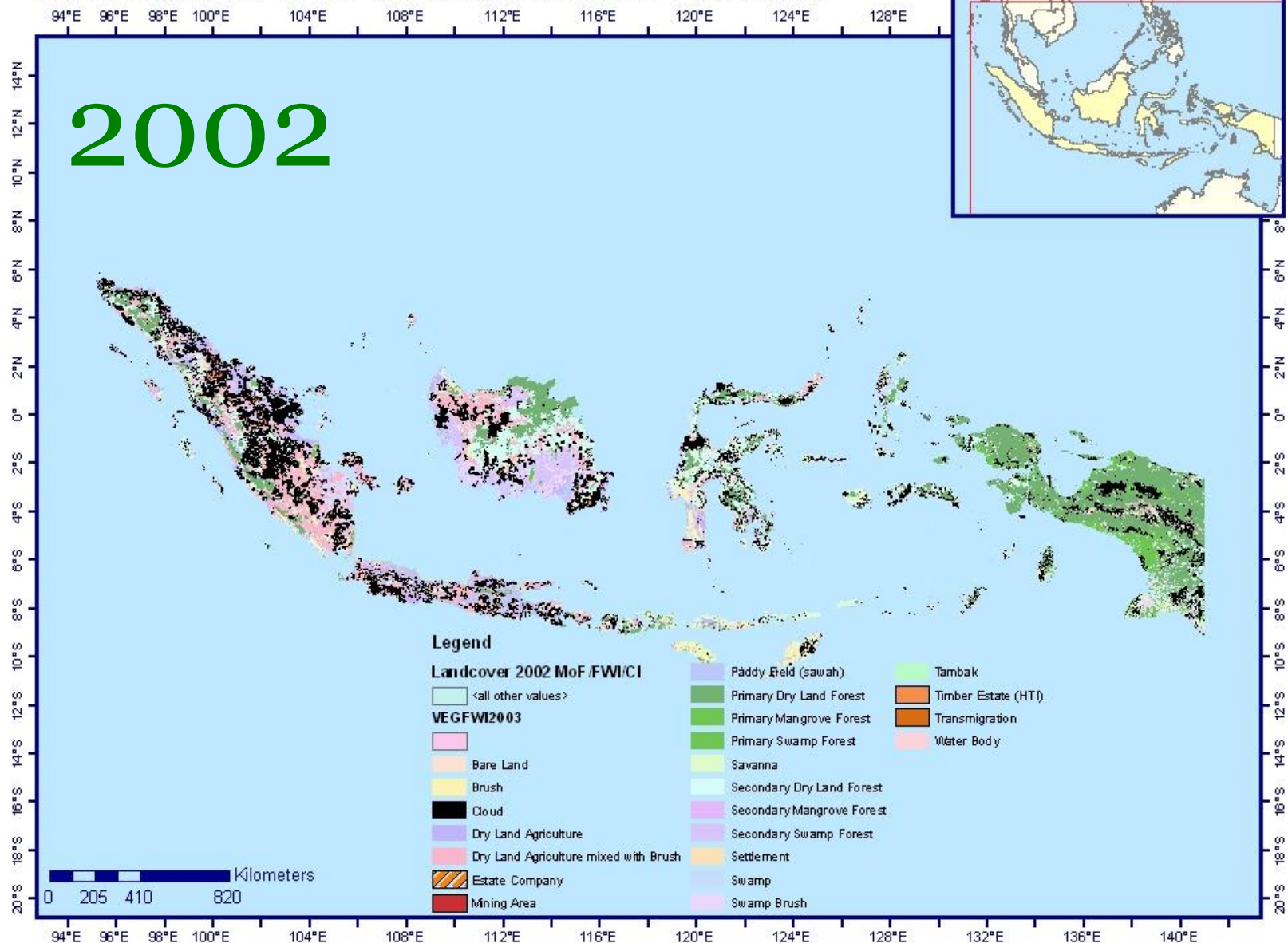
Interactive Atlas of Indonesia's Forests



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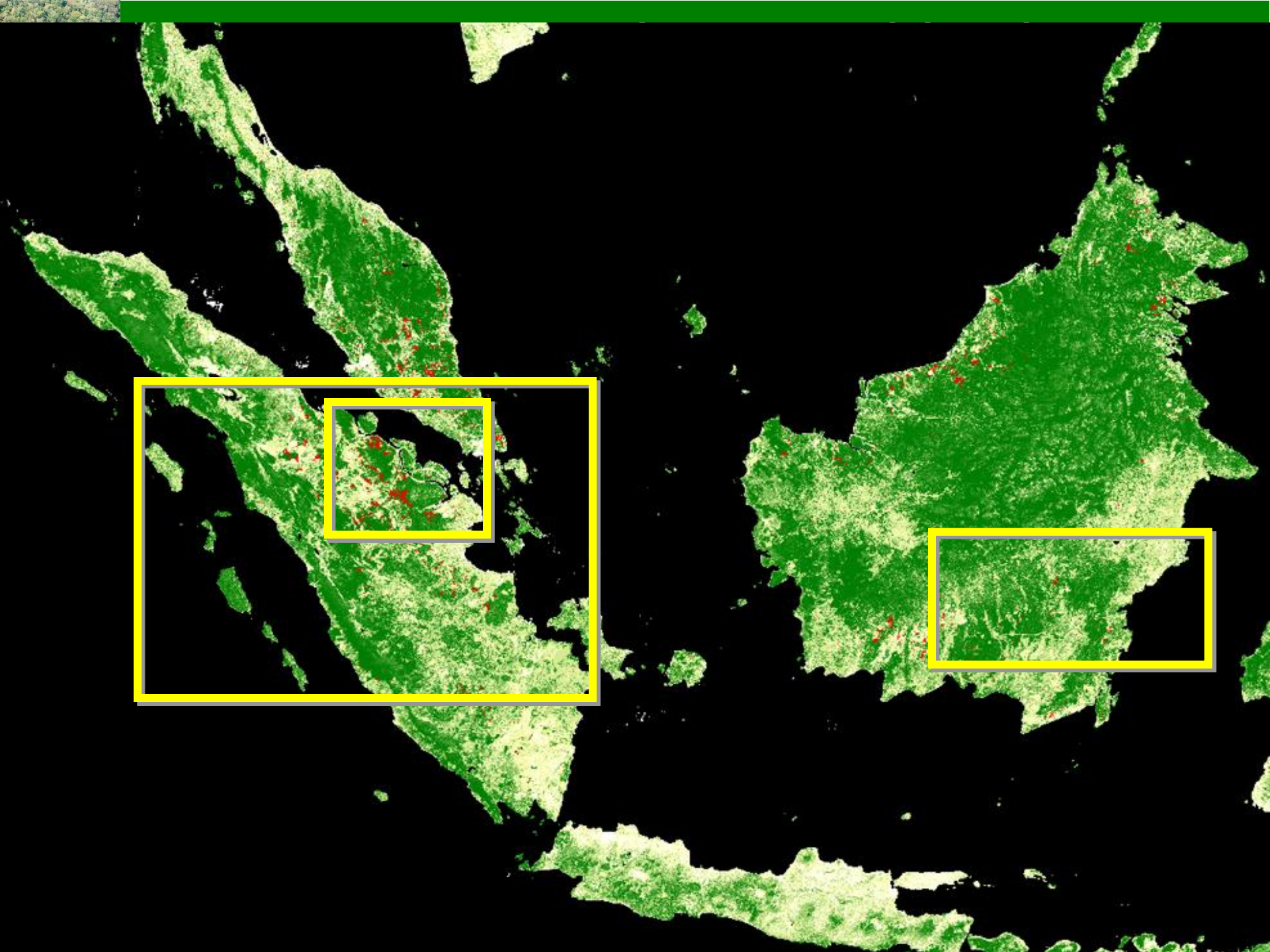
Interactive Atlas of Indonesia's Forests

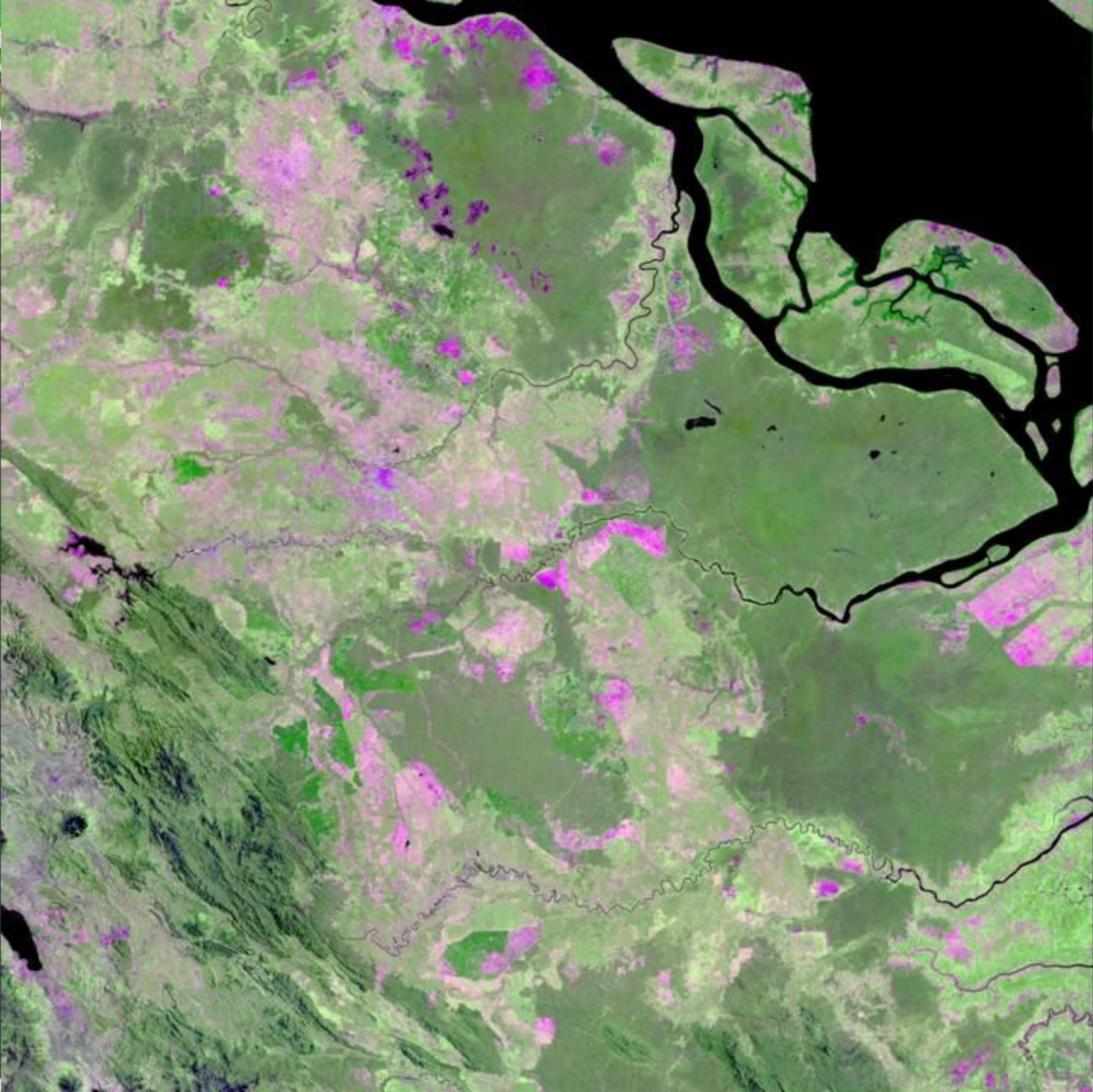


They have no clear idea of drivers and change

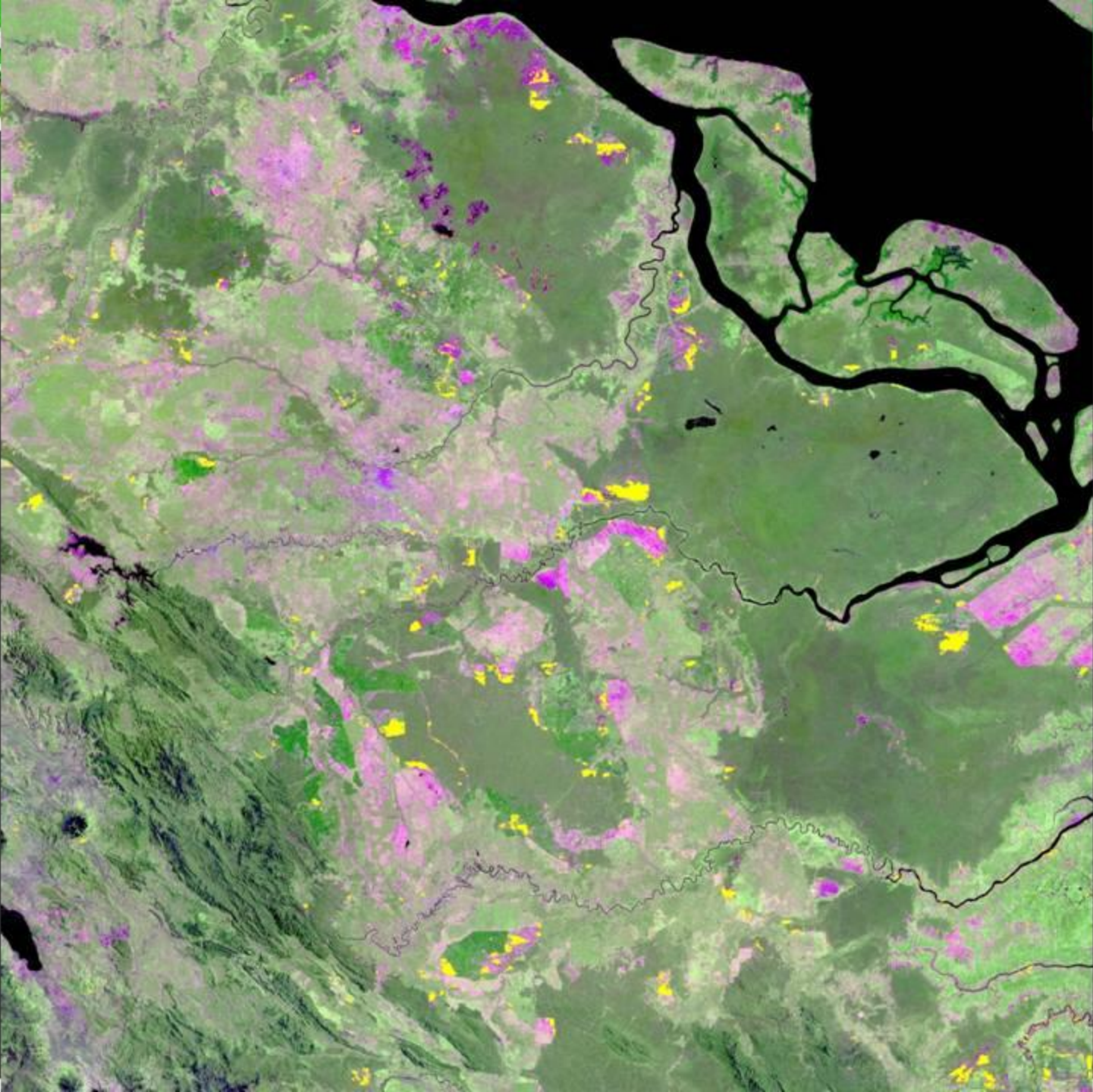
- WRI and partners worked on Systematic mapping and monitoring



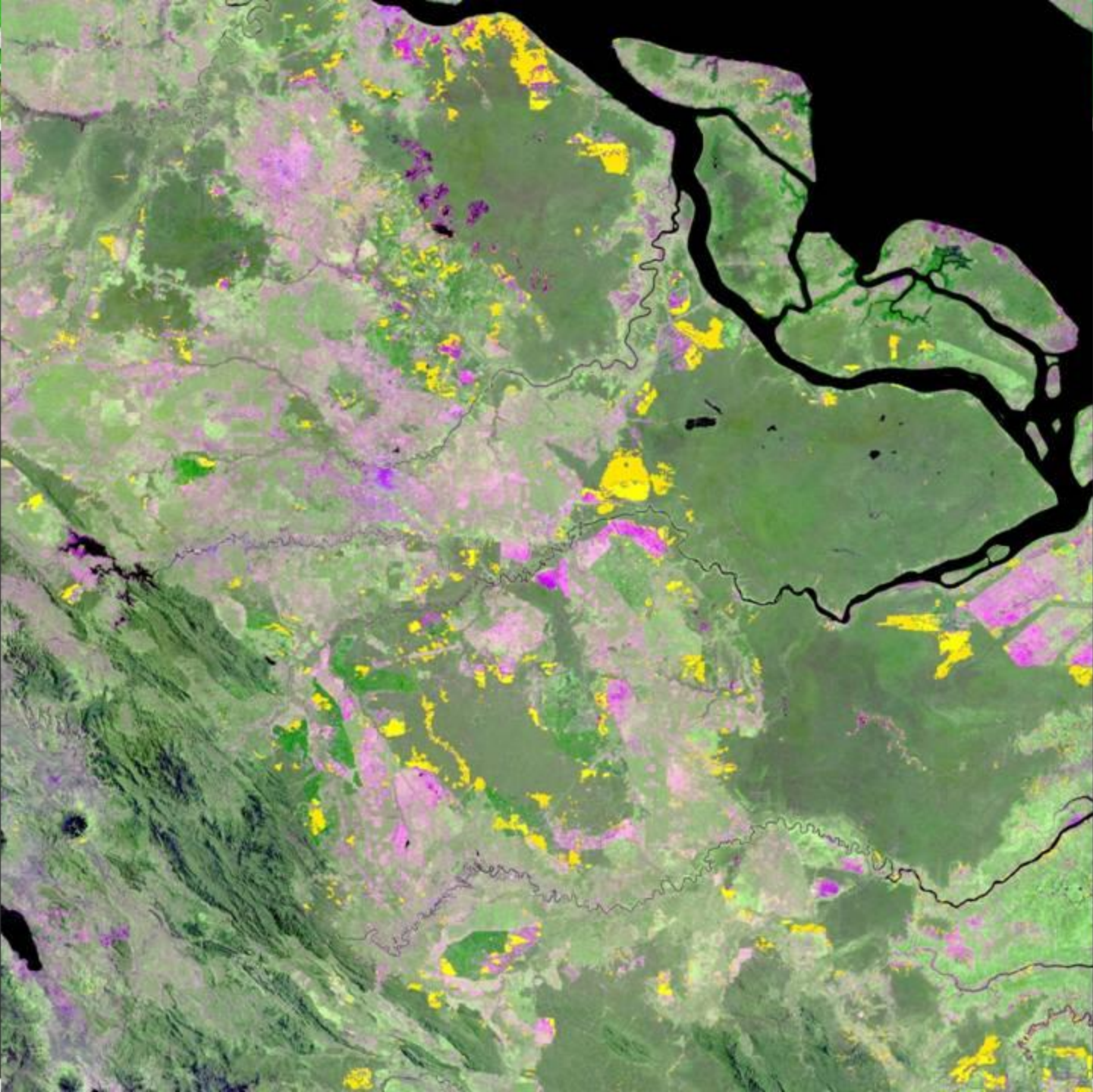




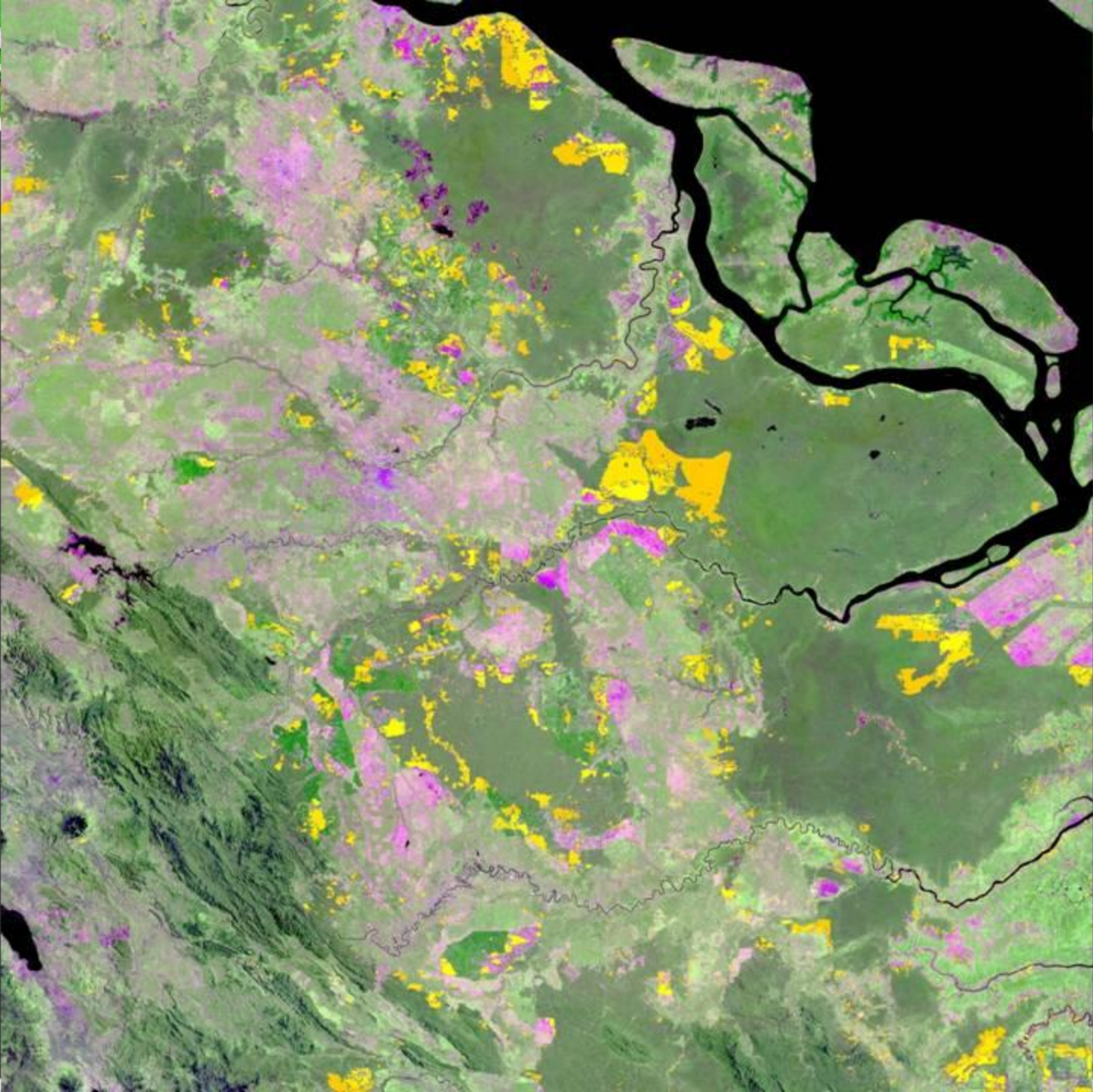
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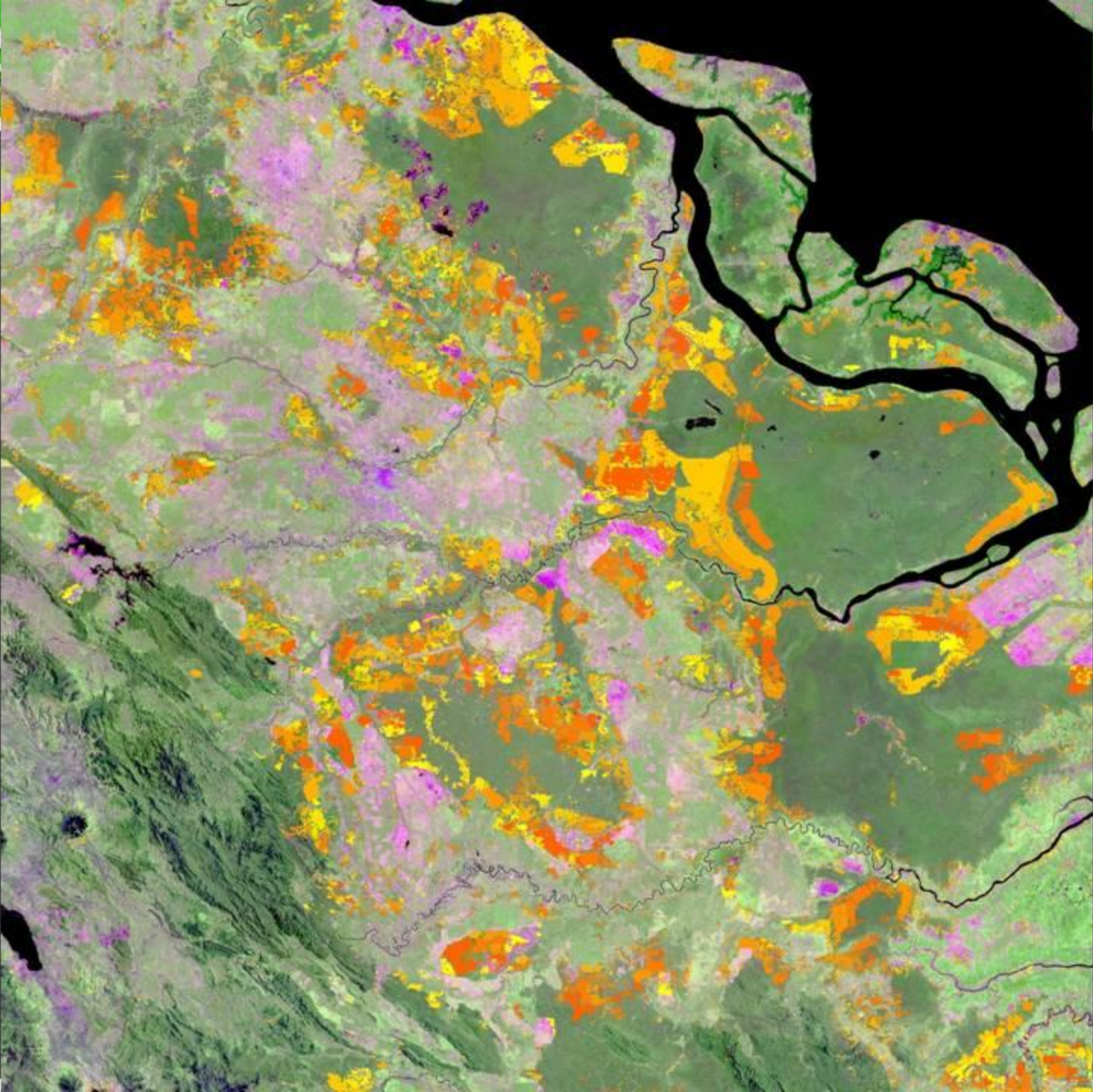
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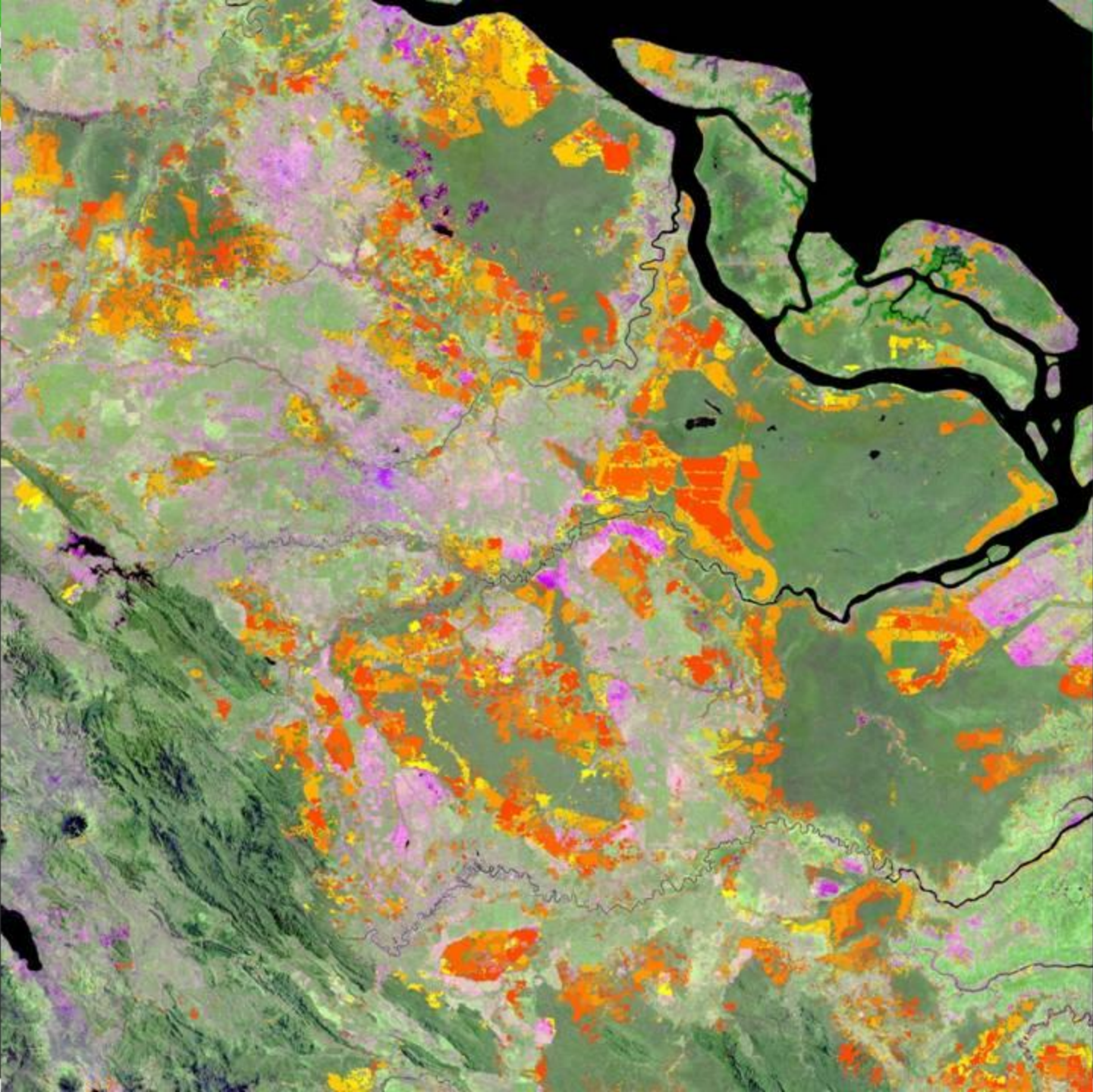


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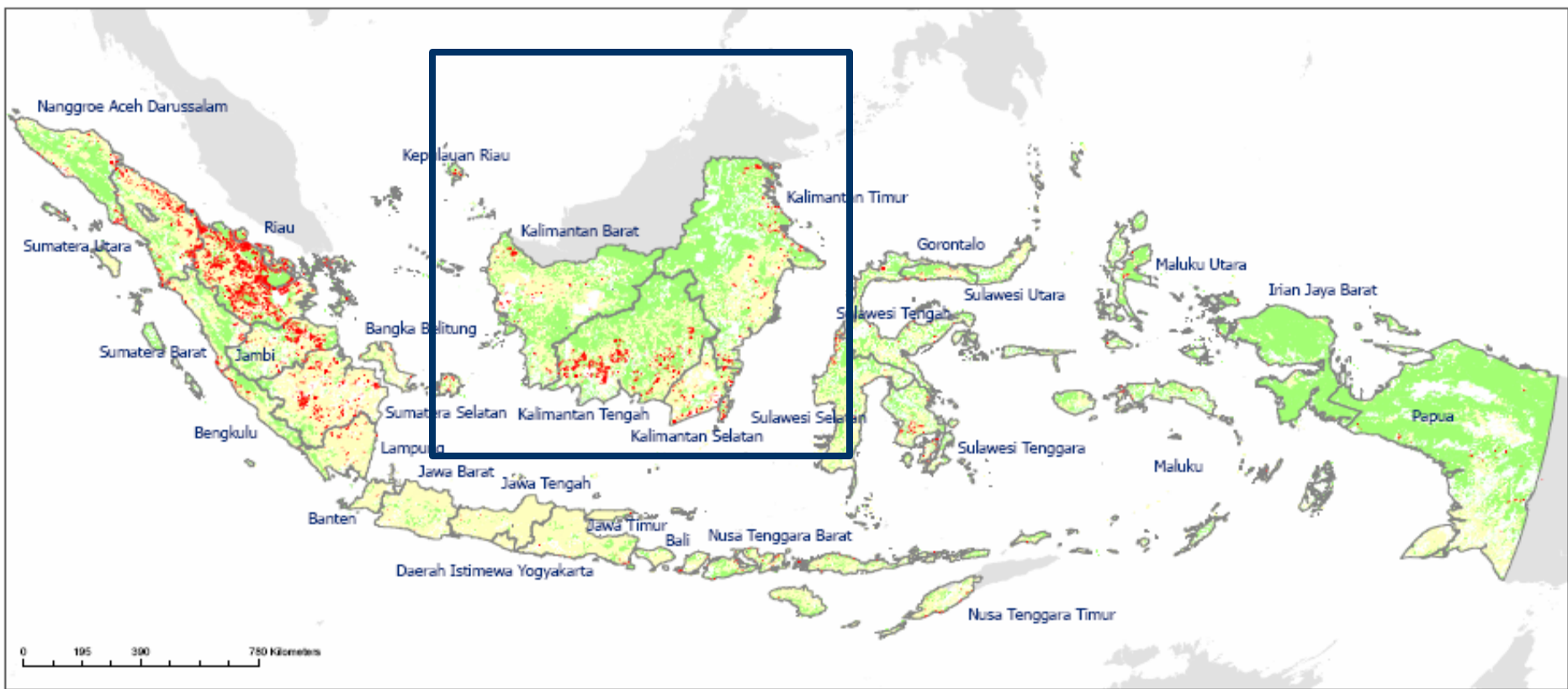








Status of Indonesia's Forests



Forest cover change areas

Landscape classes

- Natural forests
- Other areas
- No data (clouds) and inland water

21 million ha
1990-2005

MODIS analysis – SDSU/SUNY-ESF
Landsat analysis – SDSU/MoF
MODIS pre-processing – NASA/UMd/SDSU
Landsat data provision – USGS/GFW/UMd
Indonesia land cover – MoF

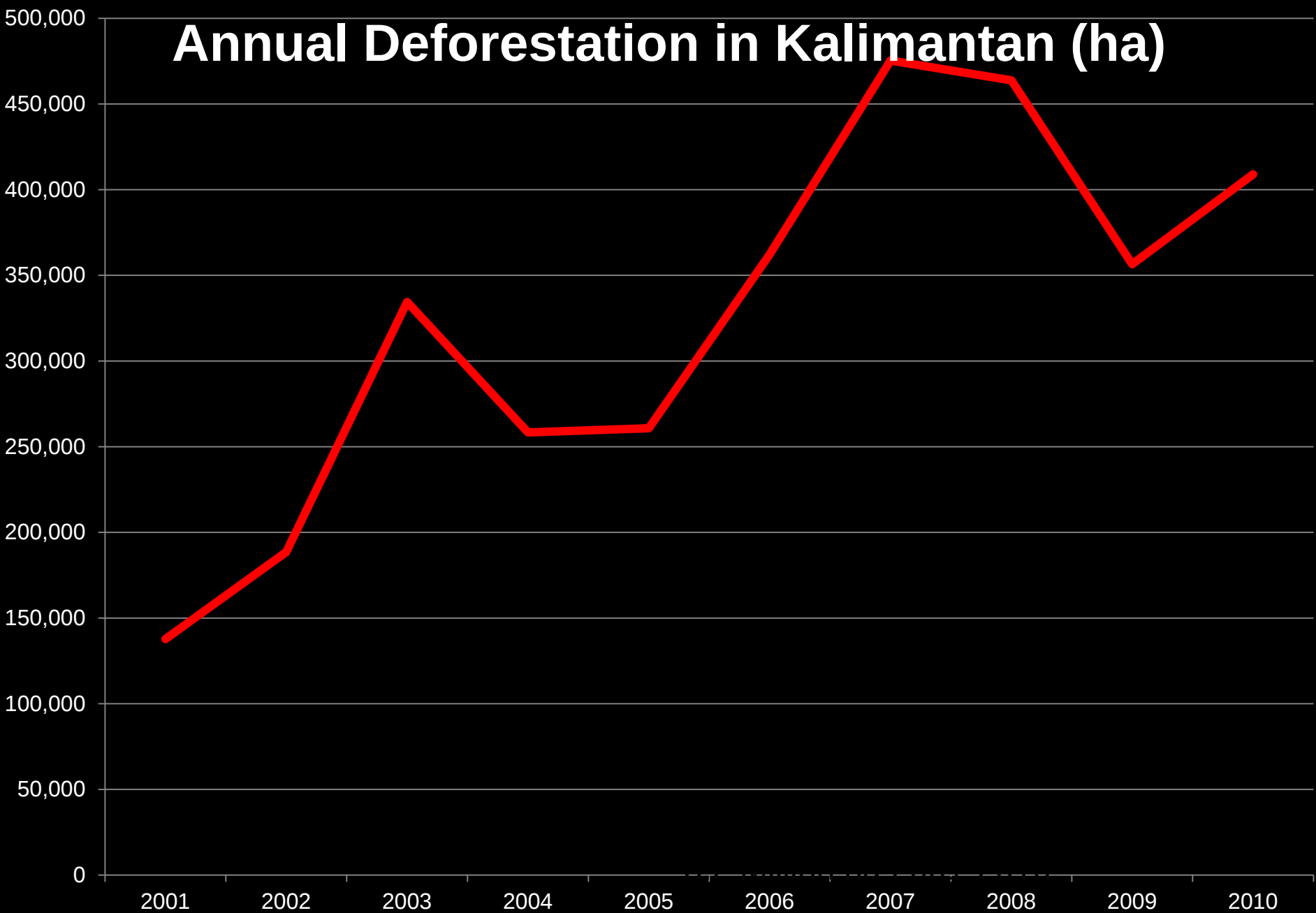


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Annual Deforestation in Kalimantan (ha)



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Started working with companies on certification issues (Unilever, Wal-Mart etc

- Don't forget the Demand side
- - RSPO
 - RSB
 - FSC



Goal 7 % GDP growth, 26%

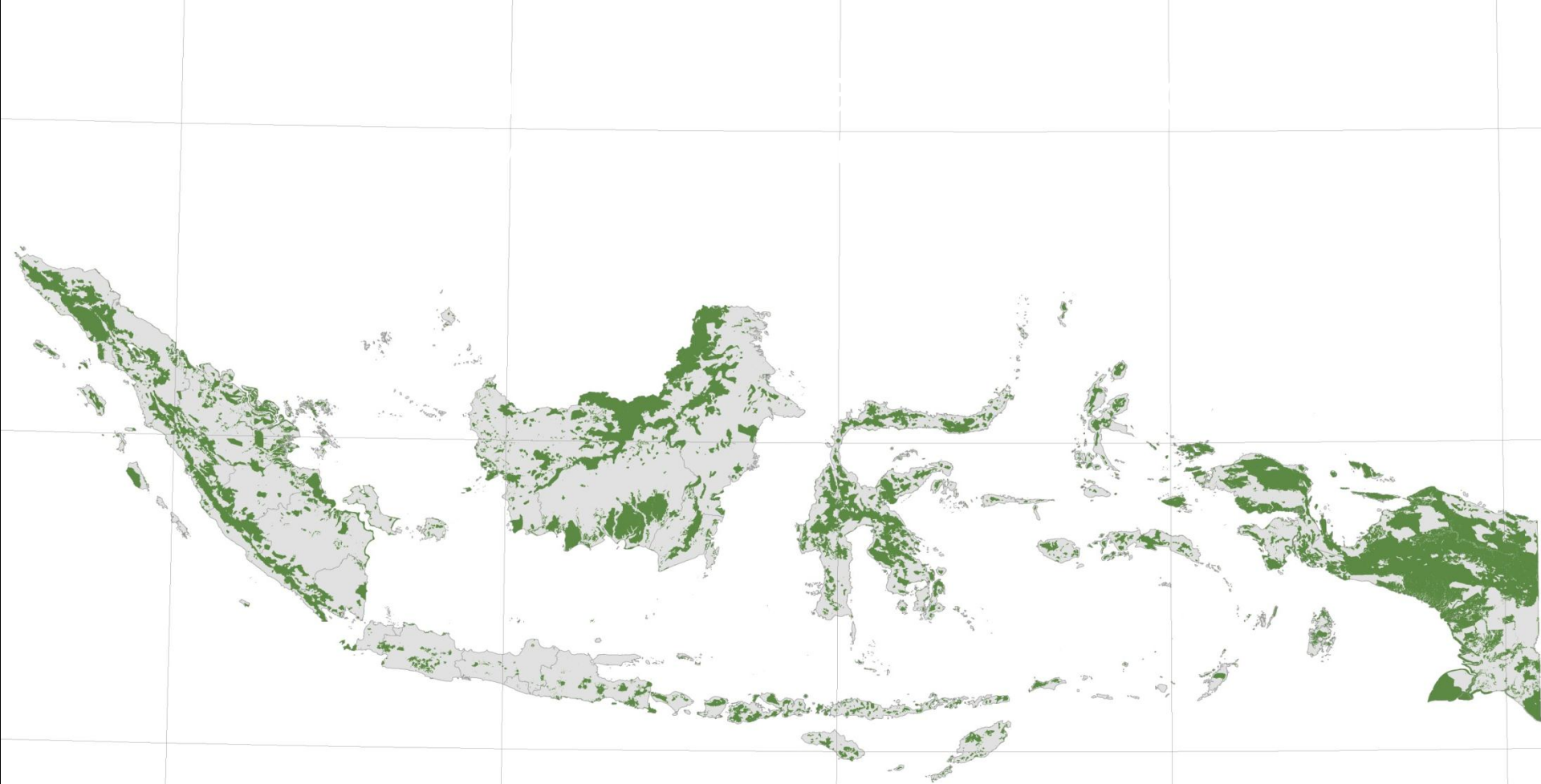
- Integrated method: Landscape thinking (smarter land use, areas for high yielding crops, conservation, logging) Integrate agric/forestry/ mining (coal). smarter land use planning
- LEDS concepts by McKinzie:
 - Jambi, Central-Kal, East-Kal



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Lands inside Moratorium (Ver 2, November, 2011)



0 350 700 1,400 Kilometers



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INDONESIA'S MORATORIUM ON NEW FOREST CONCESSIONS: KEY FINDINGS AND NEXT STEPS

KEMEN AUSTIN, STUART SHEPPARD, AND FRED STOLLE

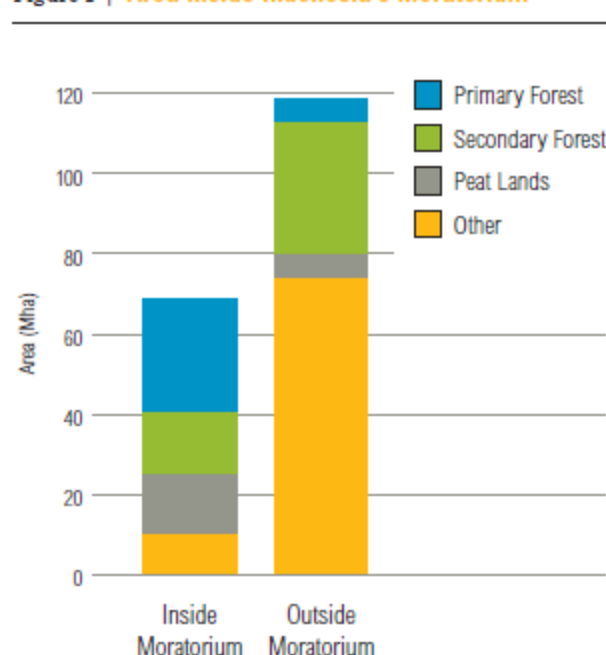
SUMMARY

The Indonesian moratorium on the award of new licenses in primary natural forests and peat lands, announced in May 2011, is an important step for improving management of forest resources by “pausing” business-as-usual and allowing time to implement reforms.

To quantify the moratorium's coverage, exemptions, encroachments, and additionality (i.e., whether the moratorium extends protection to land not already protected), the World Resources Institute (WRI) analyzed the indicative moratorium map released by the Ministry of Forestry in July 2011. The objective of the analysis was to better characterize the moratorium's potential impacts and identify opportunities for improvement.

The analysis concluded that the moratorium in its current state will not allow Indonesia to meet its greenhouse gas emission reduction goal of 26 percent by 2020. Although there are 43.3 million hectares (ha) of primary forests and peat lands and significant carbon stocks within the boundaries of the indicative moratorium map (IMM), the questionable status of secondary forests, the exemption of existing concessions, and the limited enforcement of the

Figure 1 | Area Inside Indonesia's Moratorium



3. Metadata is additional information associated with geospatial data that provides information about the data content, including, for example, when the image was created, who created it, and how the data were collected.

and enforcement will need to improve if the potential benefits of the moratorium are to be realized. In particular, improved communication of the moratorium boundaries and their significance to the local branches of key enforcement agencies is urgently needed. Local governments are additionally responsible for licensing and enforcement of conversion concessions; their compliance with the moratorium is critical. Further, updated penalties for noncompliance should be integrated into the design of the moratorium.

Table 1 | Area Inside Indonesia's Moratorium

LAND TYPE	INSIDE MORATORIUM (MHA)	OUTSIDE MORATORIUM (MHA)
Primary Forest	28.4	5.7
Secondary Forest	15.6	33.1
Peat Lands	14.9	6.0
Other	9.9	73.7

GOVERNANCE COMPONENTS

Actors

government institutions, international institutions, civil society, private sector

Rules

Policy y& law content, policy law process

Practice

implementation, administration, monitoring, enforcement

Transparency

Customary Institutions

1. Transparency of customary administration (T)
2. Dispute resolution of customary administration (A)
3. Clarity on identity of customary authority (A)
4. Ability to interact with external groups (Ca)

Inclusiveness

Land Tenure Administration Agencies

5. Capacity for implementation, of land tenure laws&policies (Ca)
6. Quality Horizontal coordination (Co)
7. Quality Vertical coordination (Co)
8. Quality internal performance monitoring (A, T)
9. Quality of independent performance monitoring (A, T)
10. Responsiveness to the need for reform (A)
11. Quality of rules to promote staff independence (Ca, A)

Accountability

Coordination

Conflict Resolution Systems

12. Expertise to handle land tenure related cases (Ca)

Capacity

Civil Society

13. Capacity to work on land tenure issues (Ca)

Law & Policy content

14. Legal recognition of customary tenure systems (A)
15. Legal recognition of multiple types of land rights (A)
16. Legal procedures to extinguish land rights (A)
17. Clarity of land tenure laws/policies (Co)
18. Consistency between land tenure laws/policies between sectors (Co)
19. Clarity of mandate for customary authorities (A, Co)
20. Clarity of mandate for government agencies (A, Co)
21. Quality of land administration (Co)
22. Legal recognition of alternative conflict resolution systems (Co)

Law & Policy Process

23. Accessibility of information on the basis and goals of reform (T)
24. Quality of media coverage on policy/law reform (T)
25. Clarity of process for public participation in policy-making (A, T)
26. Effectiveness of public participation in policy-making (A, I)
27. Quality of legislative debate on land laws (Ca)
28. Ability of public to comment on draft laws (A, T)

Implementation

29. Transparency and predictability of land tenure administration (A, T)
30. Accessibility of administrative services (I)
31. Availability of information about land tenure (T)
32. Accessibility of information on land tenure (T)
33. Transparency of the allocation and disposal of public lands (A, T)

Enforcement & Compliance

34. Accessibility of conflict resolution mechanisms (I, T)
35. Transparency of rules/processes on land cases (T)
36. Quality of efforts to enhance public awareness of laws & policies (Ca, T)
37. Quality of participation in community mapping (I)

Monitoring

38. Quality of monitoring of social impacts of land tenure laws & policies (A)
39. Quality of monitoring of the effectiveness of land tenure laws & policies (A)

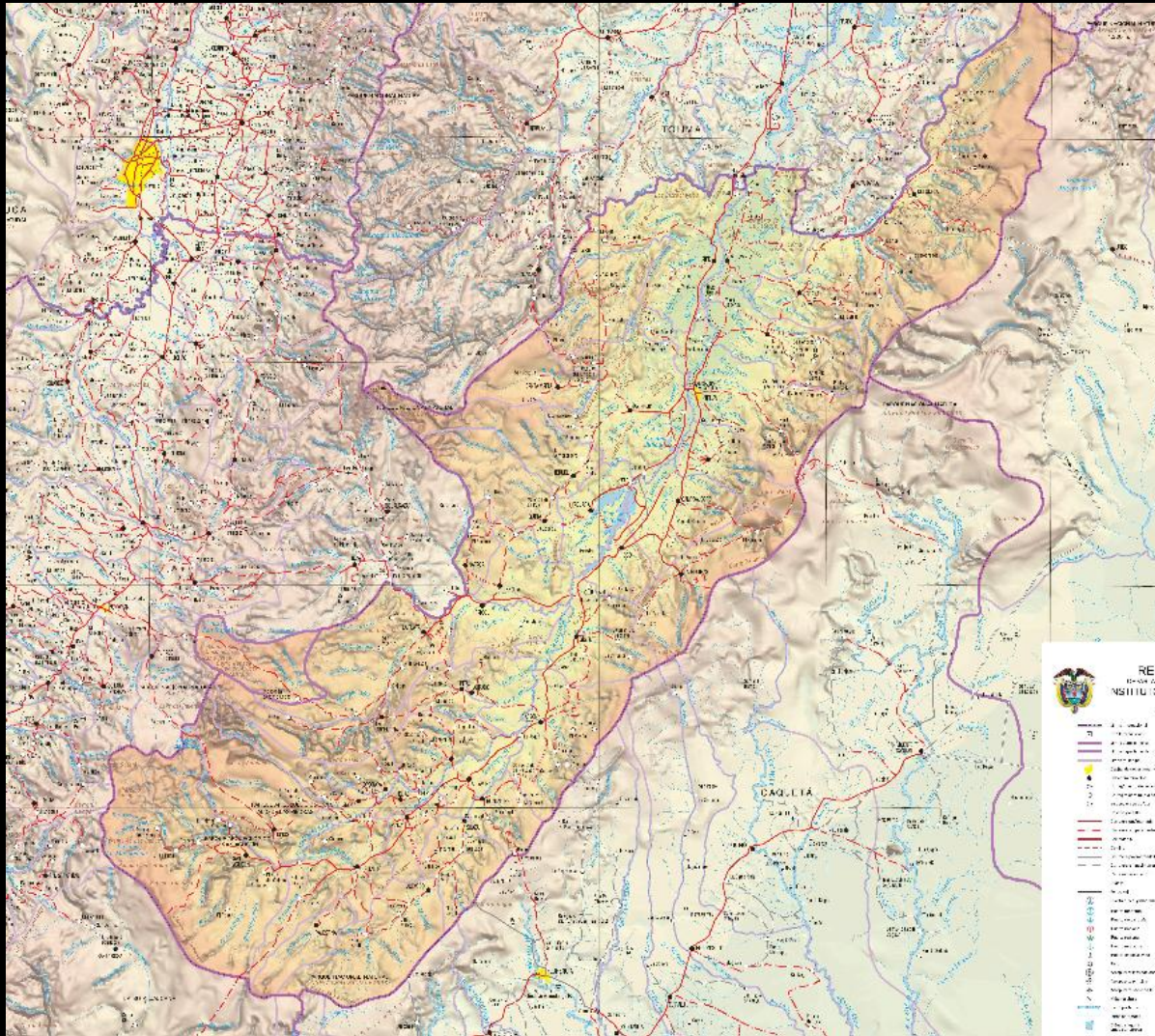


Overview

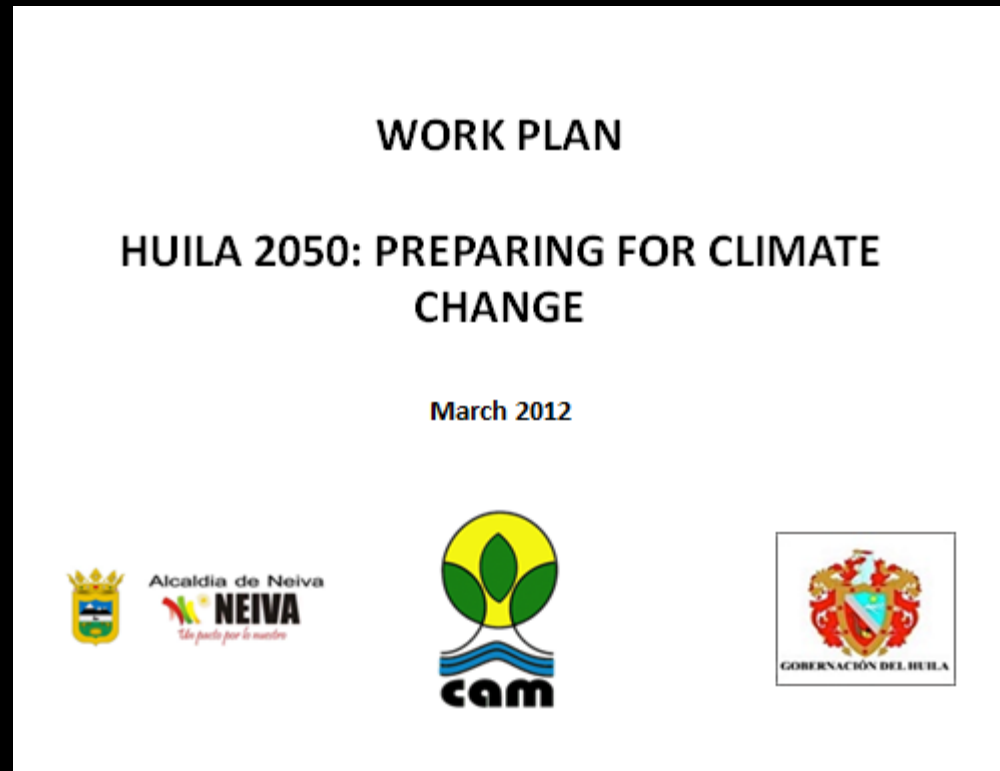
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Back to Huila



Clearly all the right intentions



Now need to implement



What WRI and partners did and learned from Indonesia



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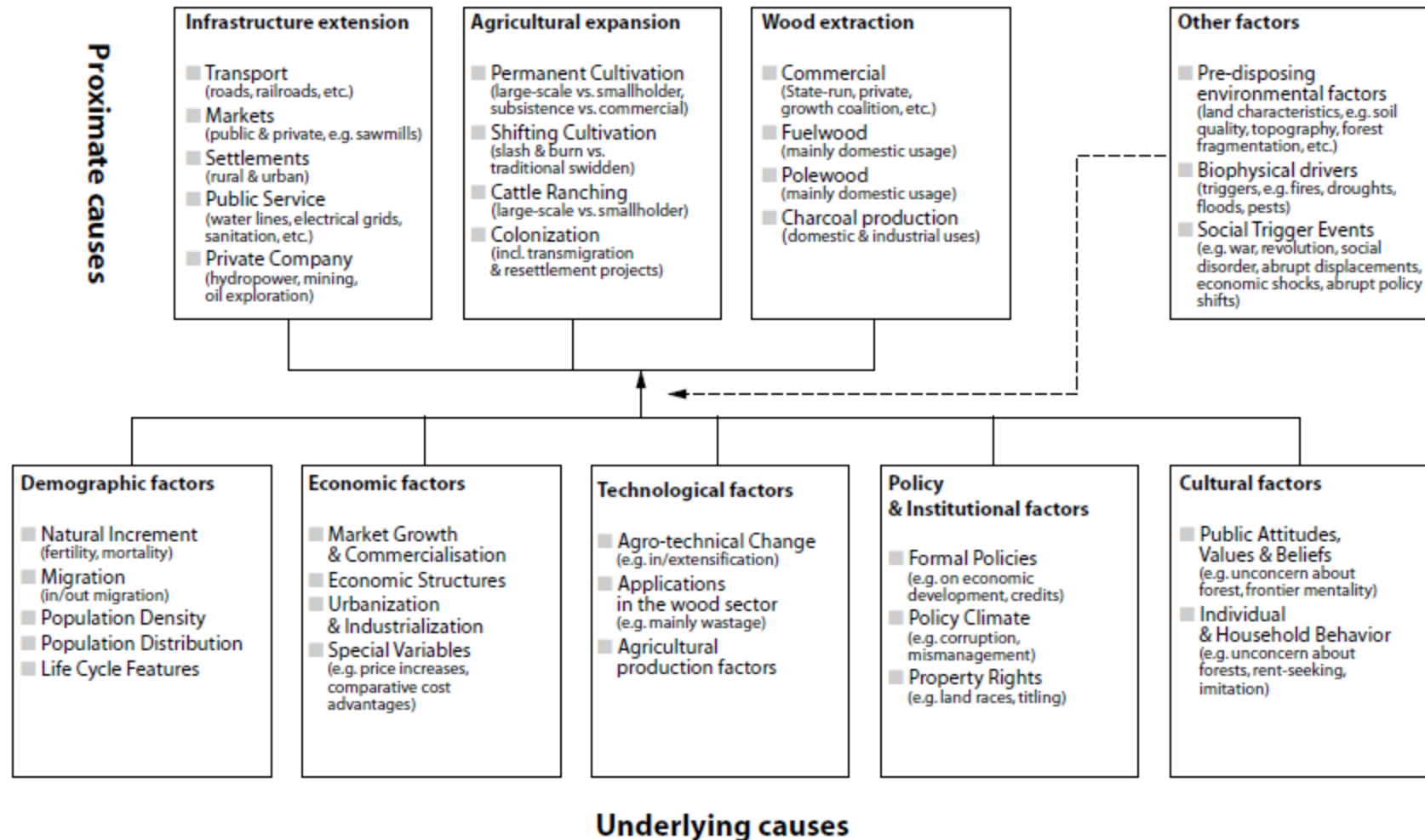
Many of Solutions already in the making (from HUILA 2050: PREPARING FOR CLIMATE CHANGE

Know your proximate and underlying drivers

- use of unsustainable cultural and production practices which result in an inadequate use of land
 - Cattle ranching Thus, this activity is carried out in an extensive manner, and in many cases, in areas where the land is not suitable for this type of use → **understand where what impact (spatial) plan and enforce**
- The project will engage relevant stakeholders → **data available and transparent**
- equilibrium models to → **scenarios of land use**
- support land use planning tools



Drivers of Deforestation



Recommendations

- Identify proxy drivers and underlying drivers
- Attack proxy drivers **and** underlying drivers.
- Don't forget the Demand side drivers the underlying causes of forest change
 - International
 - National

Certification important tool (FSC, RSPO, RSB)



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The Corporate Ecosystem Services Review

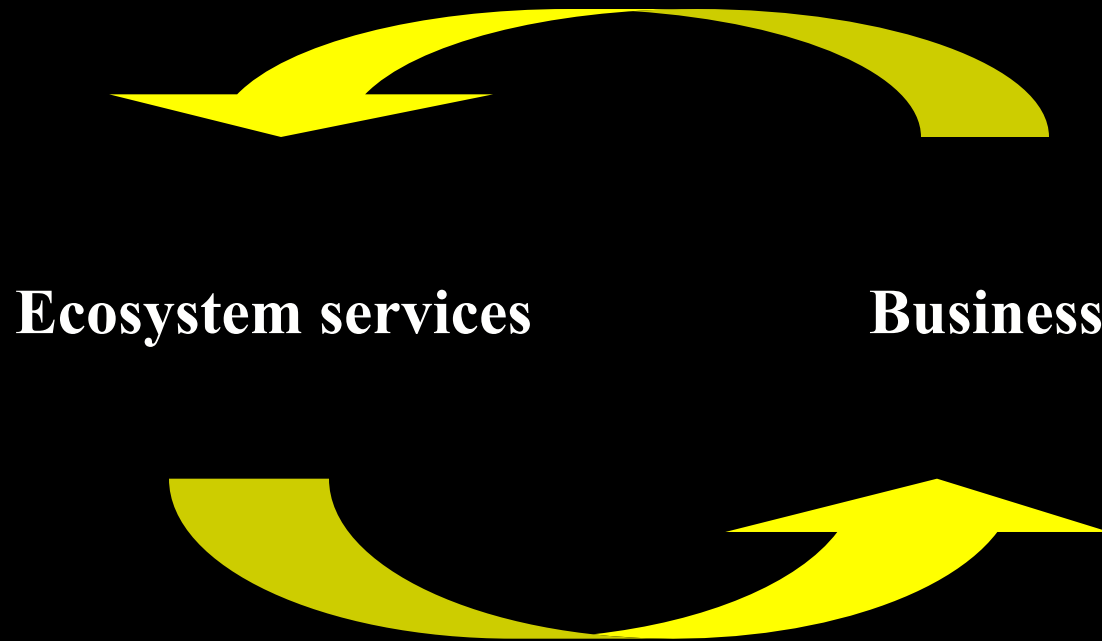


Ecosystem services and their global status

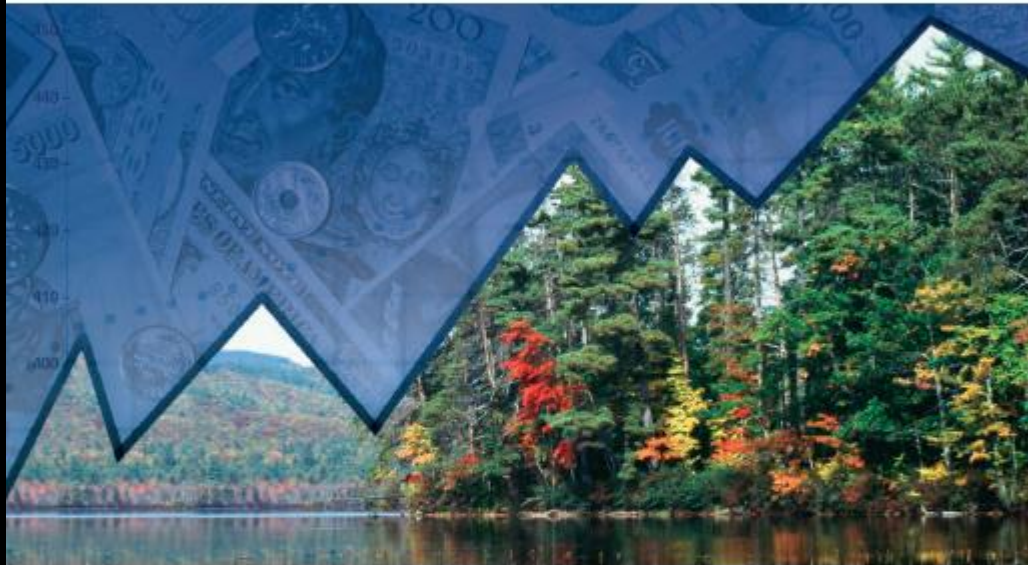
	Degraded	Mixed	Enhanced
Provisioning	- Capture fisheries - Wild foods - Biomass fuel - Genetic resources - Biochemicals - Freshwater	- Timber - Fiber	- Crops - Livestock - Aquaculture
Regulating	- Air quality control - Climate regulation - Erosion control - Water purification - Pest regulation - Pollination - Natural hazard control	- Water regulation - Disease regulation	Carbon sequestration
Cultural	- Spiritual values - Aesthetic values	- Recreation - Ecotourism	



Business and ecosystem services are closely linked



THE CORPORATE ECOSYSTEM SERVICES REVIEW



Guidelines for Identifying Business Risks and Opportunities Arising from Ecosystem Change

Version 2.0



RioTinto

syngenta

www.wri.org/ecosystems/esr

Risks and opportunities

NOT EXHAUSTIVE

Type	Risk	Opportunity
Operational	• Increased scarcity or cost of inputs • Reduced output or productivity • Disruption to business operations	• Increased efficiency • Low-impact industrial processes
Regulatory and legal	• Extraction moratoria • Lower quotas • Fines, user fees • Permit or license suspension • Permit denial • Lawsuits	• Formal license to expand operations • New products to meet new regulations • Opportunity to shape government policy
Reputational	• Damage to brand or image • Challenge to social “license to operate”	• Improved or differentiated brand
Market and product	• Changes in customer preferences (public sector, private sector)	• New products or services • Markets for certified products • Markets for ecosystem services • New revenue streams from company-owned or managed ecosystems
Financing	• Higher cost of capital • More rigorous lending requirements	• Increased investment by progressive lenders and socially responsible investment funds



Step 5. Categories of strategies

Internal changes

Operations

Product strategy

Market strategy

Procurement strategy

Land management

Etc.

Sector or stakeholder engagement

Industry peer collaboration

Cross-sector collaboration

NGO collaboration

Transactions with stakeholders

Etc.

Policy-maker engagement

Tax incentives

Subsidy reforms

Protected areas

Zoning

Etc.



The ESR's value added

Beyond biodiversity and emissions

Impacts *and* dependence

New considerations (e.g., regulating services)

Links profit, planet, and people

Systematic

Flexible



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- 48% of the department territory currently presents significant land use conflicts of which 33% are associated with ecosystem transformation, particularly for cattle ranching → **governance issues. What needs to change**
- lack of governance, and lack of development of productive activities → **understand the governance issues**



Recommendations

- Underlying drivers need to be tackled by governance reform. You can also “measure” governance
- Assess Governance



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Recommendations

- Go into technical details on land use. Where is best place for what crop ecosystem wise and profit wise
- Use Degraded land is ? Degraded for logging might be just right for local uses



Land Use Plan

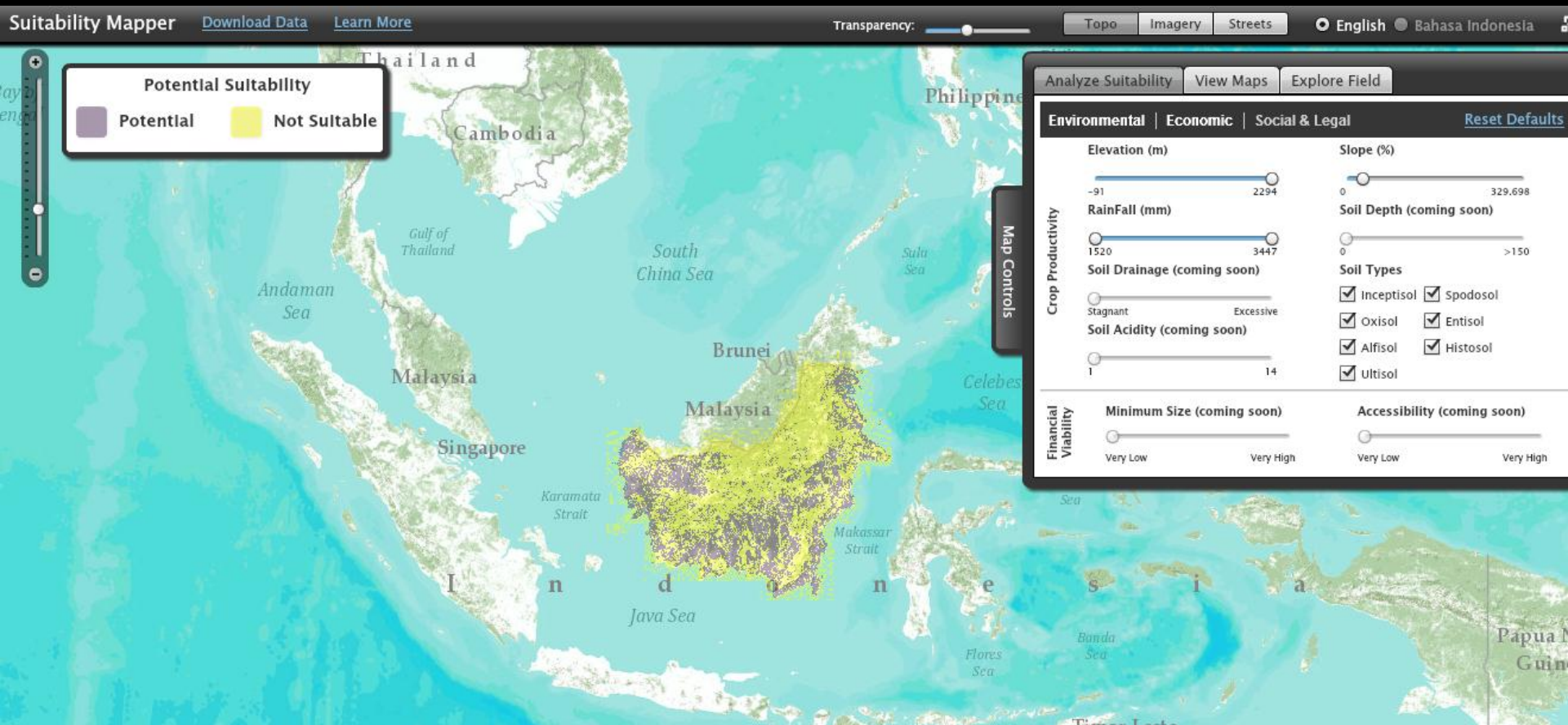


Table 2. Inputs for Combined Suitability Mapping

Consideration	Criteria	Indicator	Suitable (1)	Suitable with Consideration (2)	Not Suitable (3)
Oil Palm Suitability	Topography	Elevation (meter)	< 500	500 - 1000	> 1000
		Slope (percent)	< 40	-	> 40
	Climate	Rainfall (mm/year)	1750 - 6000	1250 - 1750	> 6000
	Soil	Soil Depth (cm)	> 50	-	< 50
		Soil Texture/Type	Silt loam; sandy clay loam; Silty clay loam; clay loam (dry or wet inceptisol; oxisol)	Clay; loamy sand; sandy loam; loam (ulfisol); sandy clay; silt (spodosol; entisol)	Heavy clay; sand (histosol)
		Soil Drainage	Good; moderately good	Excessive; poor	Very excessive; very poor; stagnant
		Acidity Grade (pH)	4 – 6,5	3,5 – 4 and 6,5 - 7	< 3,5 and > 7
	Peat	Peat Soil Depth (cm)	No peat soil (0 cm)	-	Peat soil of any depth (>0 cm)
	Groundwater Recharge Potential		< 33	34-55	>56
	Erosion Risk (USLE)		0- 20	20 - 100	> 100
Land Cover	Land Cover		Shrub/bush; Savanna; Open Land	Dry land farming; Dry land farming-mixed shrub; Shrub swamp; Plantation Forest; Estate crop plantation; Rice fields; Mining area	All natural primary and secondary forest: mangrove forest, dry land forest, swamp forest; Airport; Settlement; Transmigration area; Swamp; Fishpond
Conservation	Conservation Area		Not Hutan Lindung (Protection Forest); Not Hutan Konservasi (Conservation Forest)	-	Hutan Lindung (Protection Forest); Hutan Konservasi (Conservation Forest)
	Buffer Zone		Outside of Buffer Zone around shoreline, stream, river, spring, lake edge, or conservation area	-	Within Buffer Zone around shoreline, stream, river, spring, lake edge, or conservation area



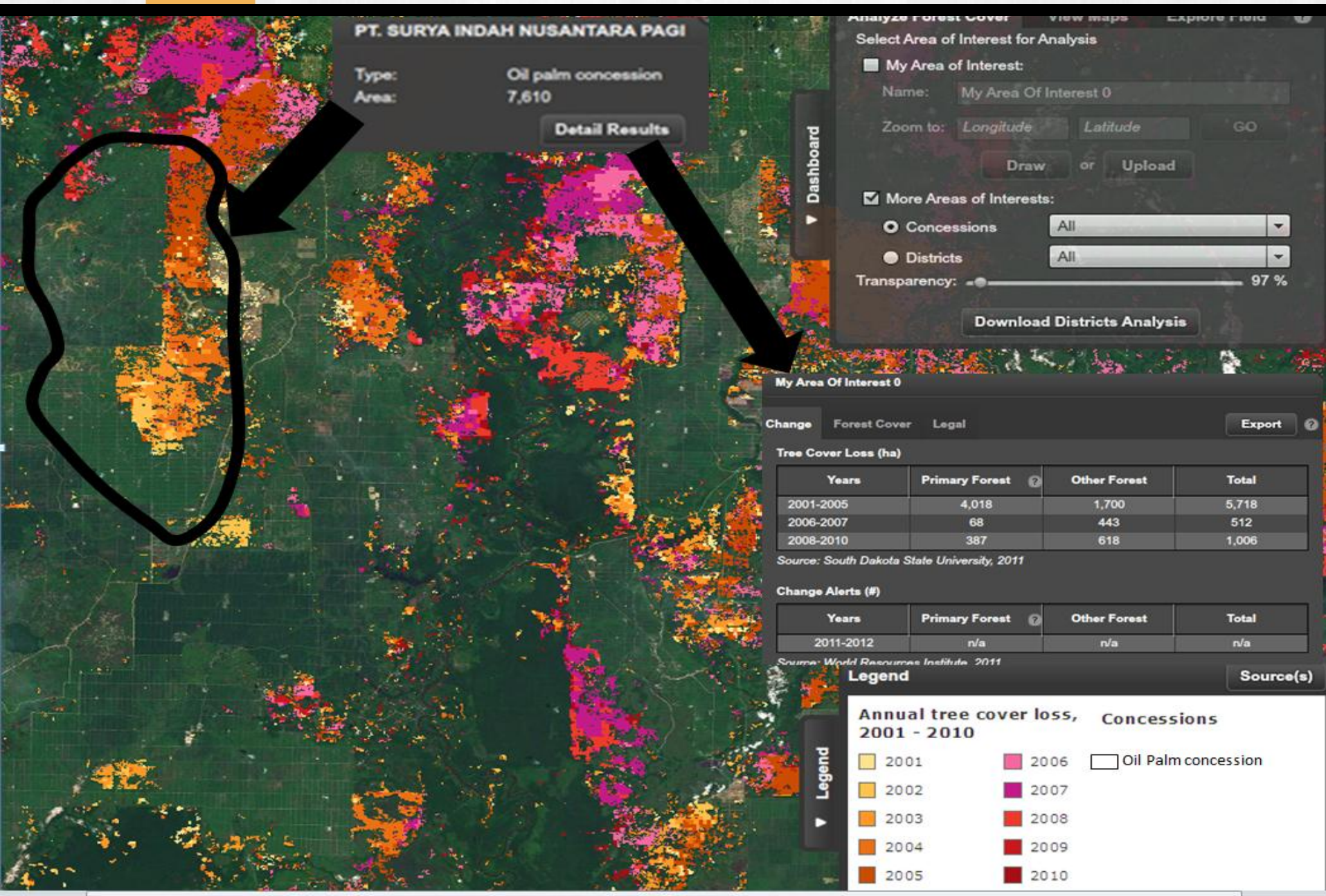
Overview

1. What is The problem
2. RED → REDD → REDD+ → LEDS
3. Indonesia
4. Huila Prepare for 2050
 1. Drivers and Data
 1. Ecosystem Service Review
 2. Governance Reform
 3. Land Use Planning
 4. Open Data
5. Main Messages



Open data for enforcement – Global Forest Watch 2.0





Overview

1. What is The problem
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Main Messages

- Deliver REDD via LEDS (DEVELOPMENT)
- Understand, Measure, Monitor, and Manage
 - Current land use
 - Drivers (demand and supply)
 - Stakeholders (use of land and yield)
 - Efficiency
 - Governance
- Key is analyze, measure, plan and enforce
- To be successful NEED to go technical hand-in-hand with Governance reform.



“If you can’t measure it
you can’t manage it”

“If you can’t measure it
you can’t regulate it”

“If you can’t measure it
you can’t trust it”

“If you can’t measure it
you can’t improve it”



