

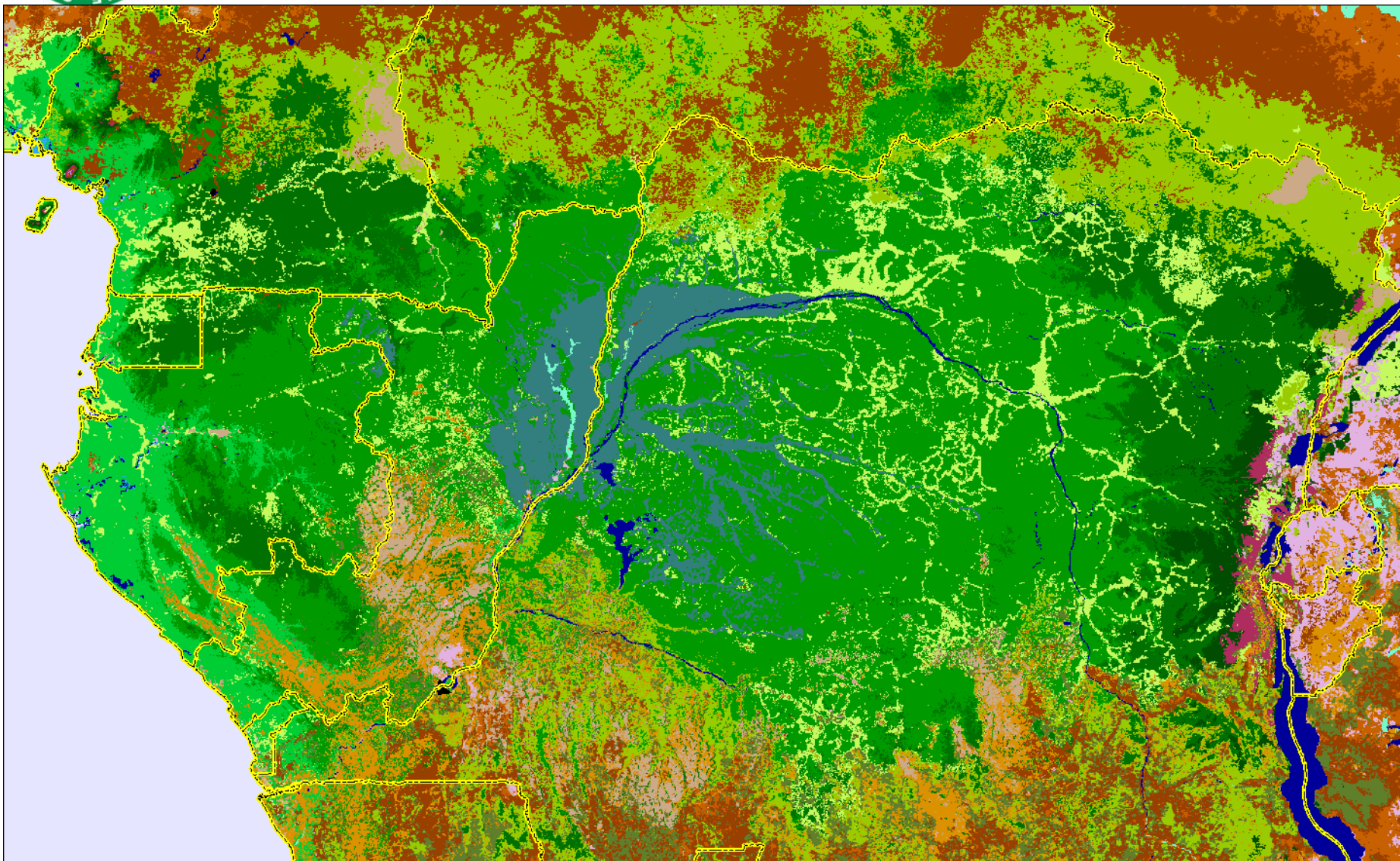
Deforestation and degradation estimates in the Congo Basin

Philippe Mayaux,
Pierre Defourny, Grégory Duveiller





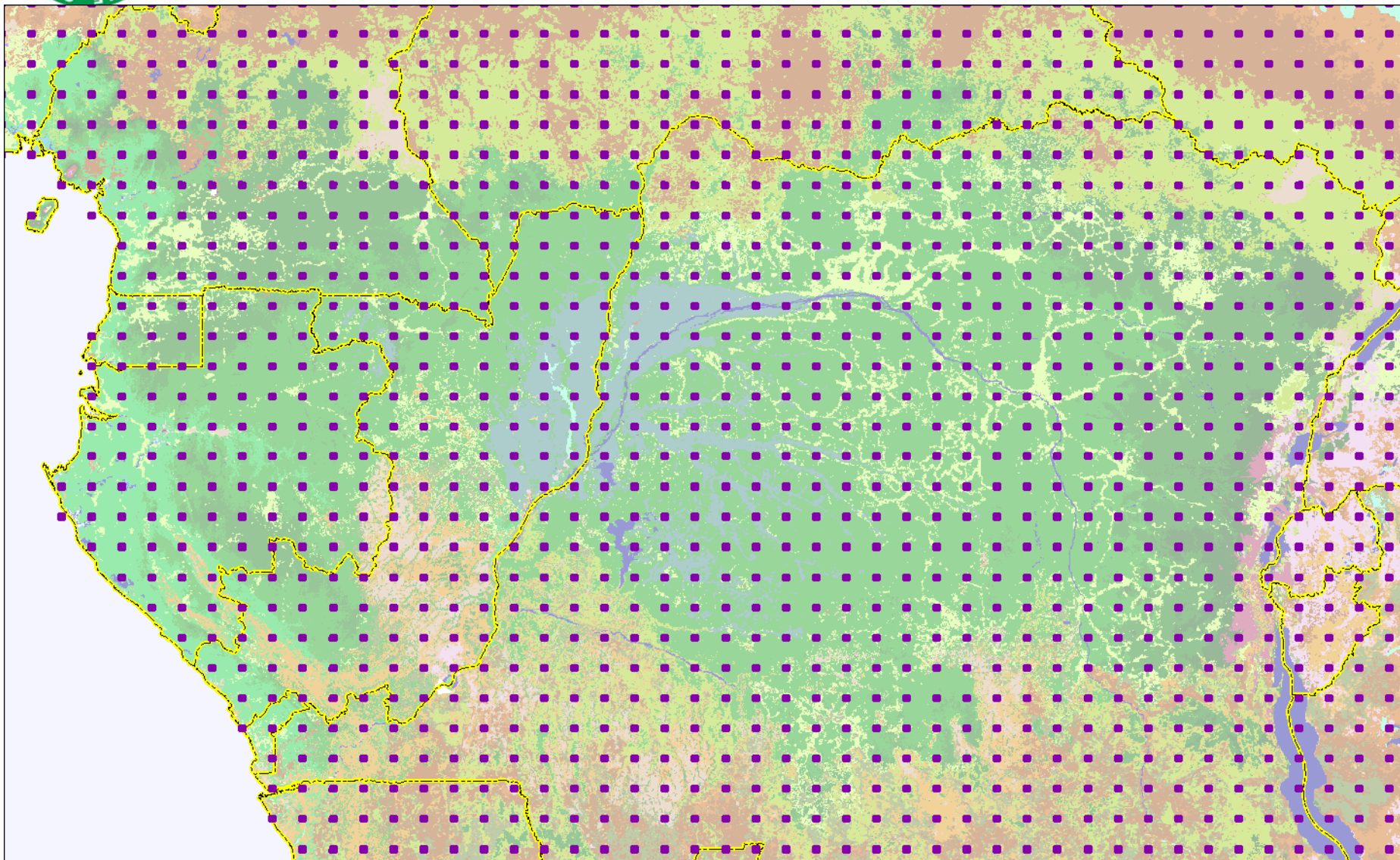
Forests of Central Africa



- Sampling scheme
 - systematic, $\frac{1}{2}$ degree, boxes of 10x10 km, 4%
- Reference material
 - Landsat TM & ETM
- Legend
 - Dense forests, degraded forests, mosaics, other vegetation (non woody), bare soil, water
- Classification
 - Segmentation at two levels
- Statistics
 - National and regional level, large landscapes

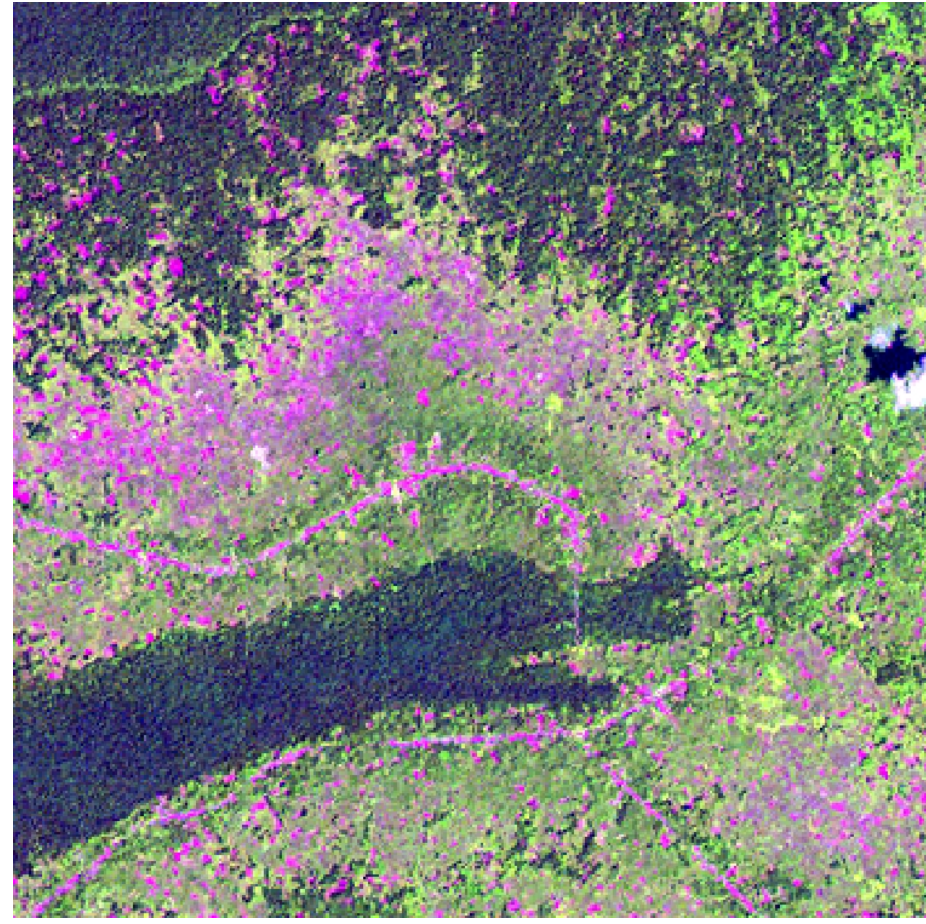
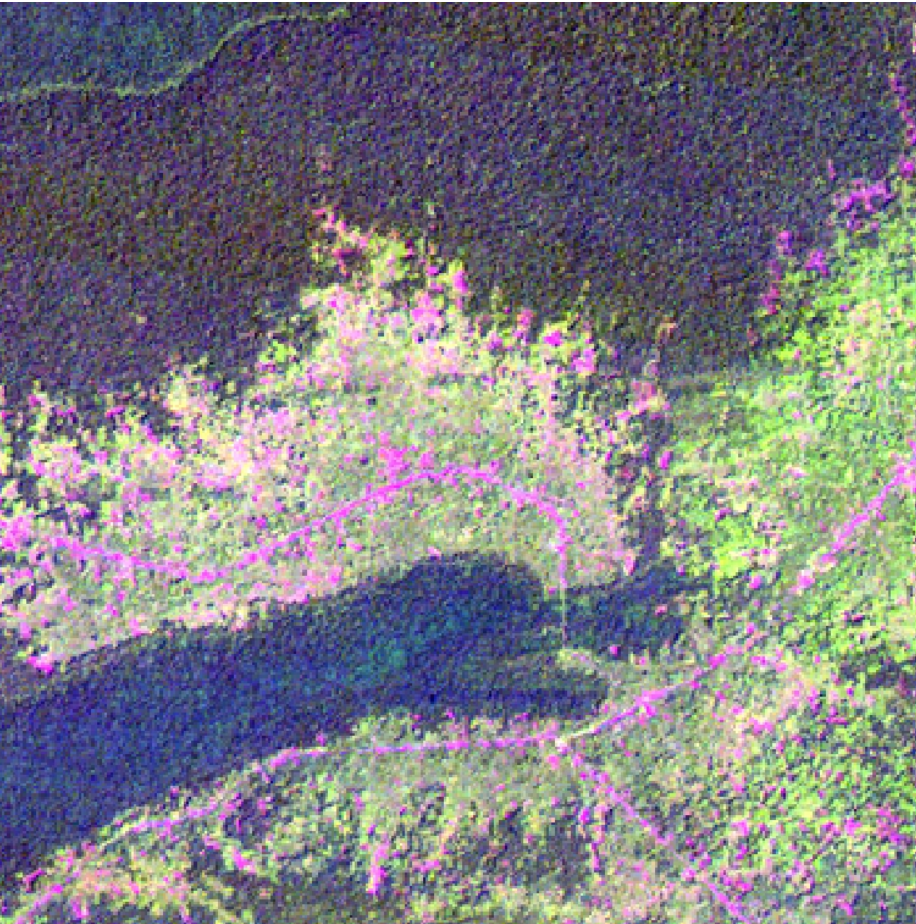


Sampling scheme





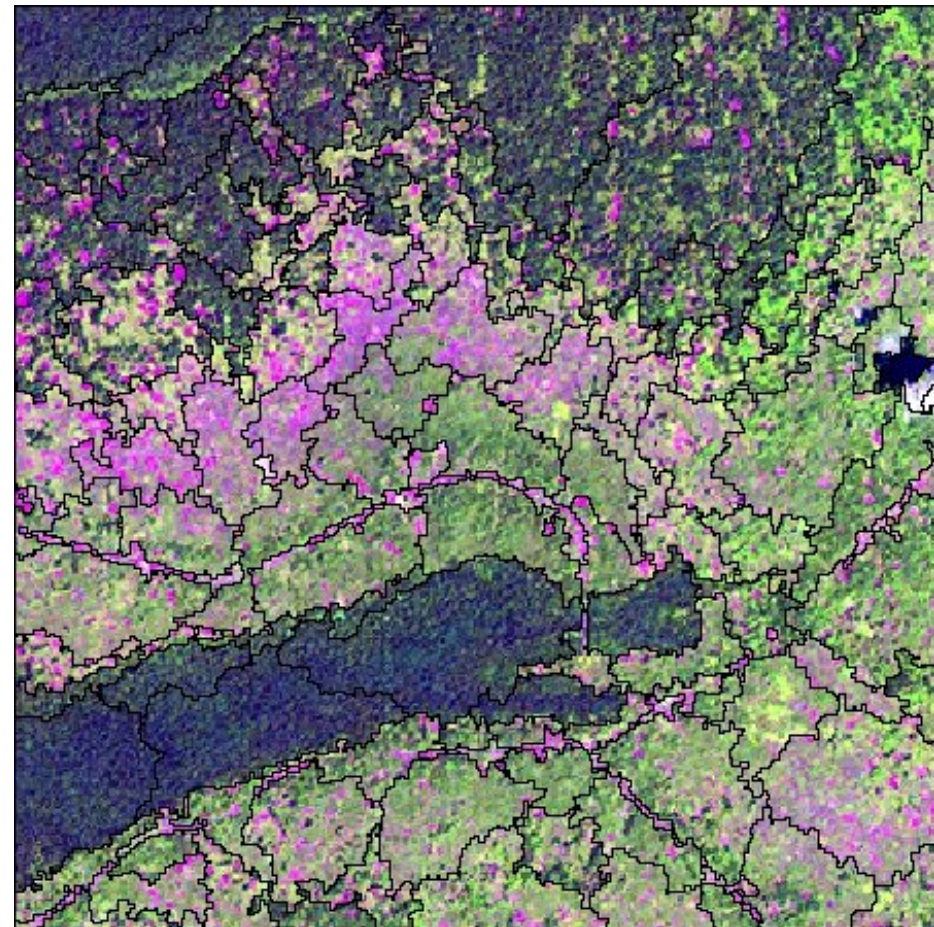
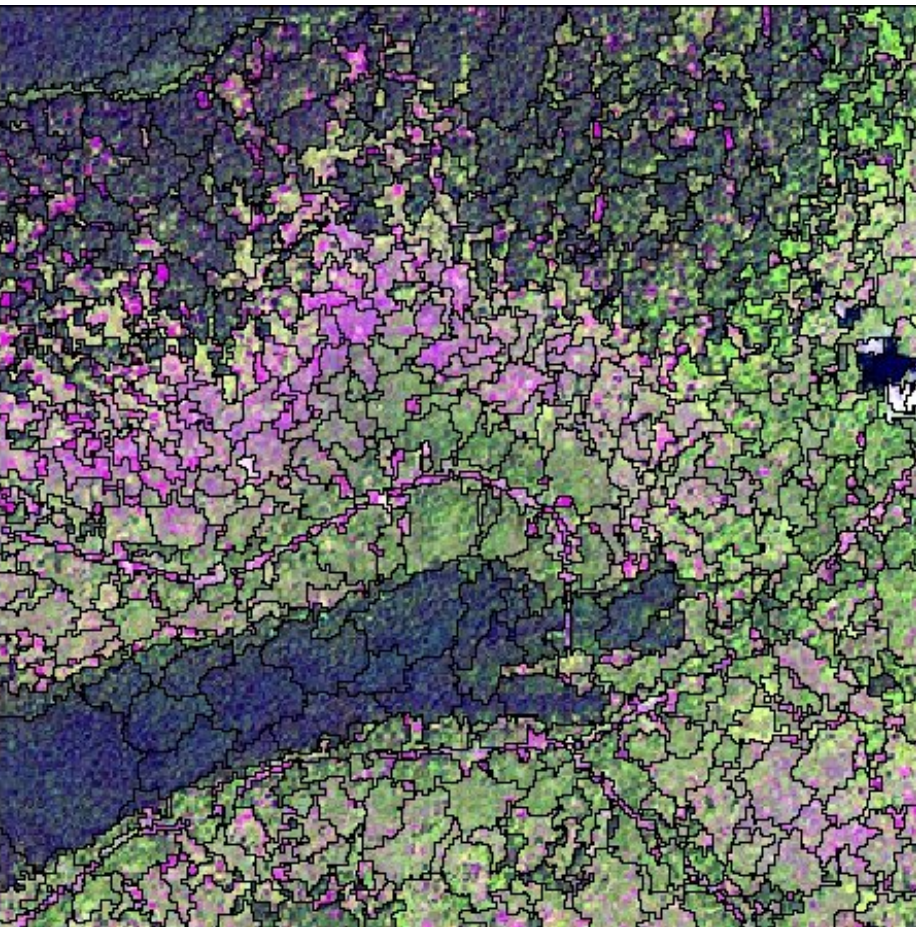
Landsat 1990 and 2000





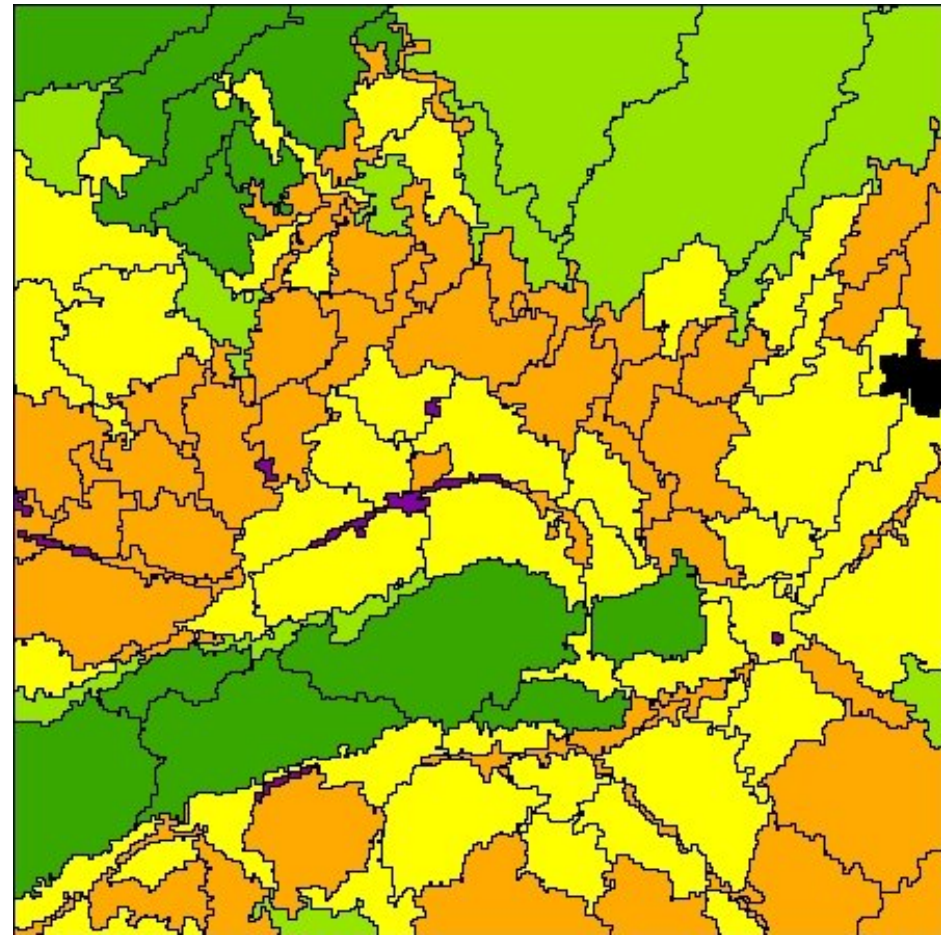
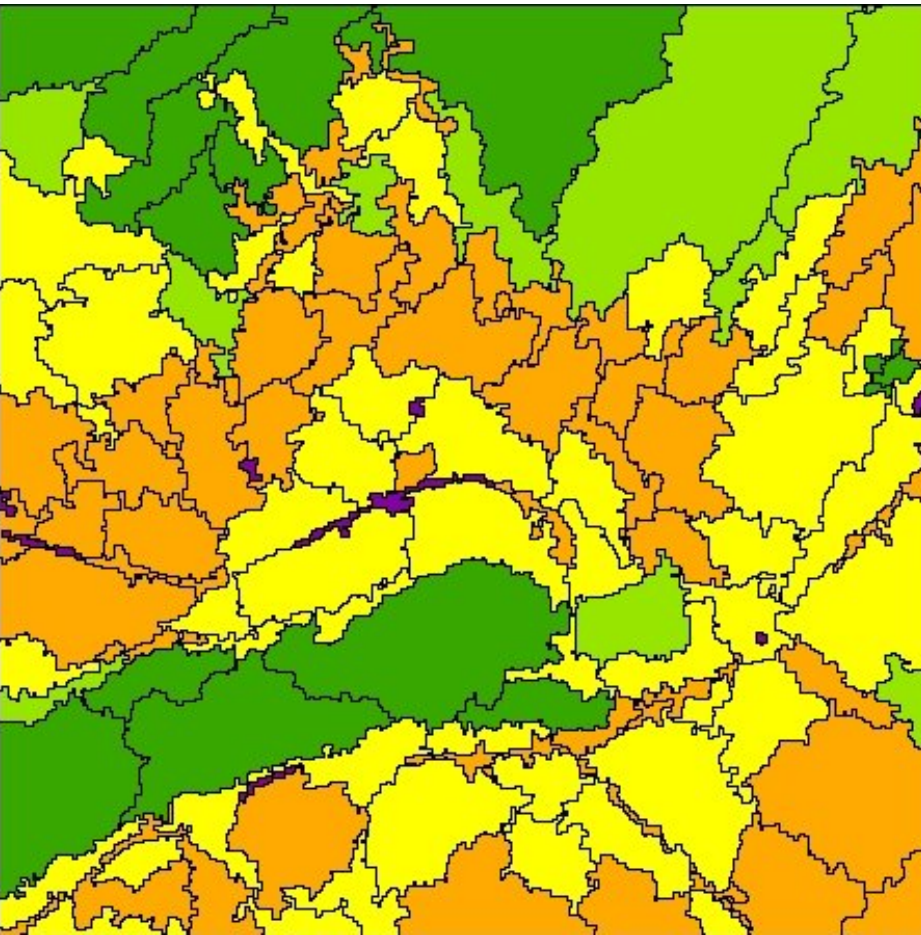
	Dense forest	Degraded forest	Mosaics	Urban/ Bare soil	Savanna
For. Dense (FC >70%)		REGENERATION	REFORESTATION		
For. Dégradée (FC 30-70%)	DEGRADATION				
Mosaïque Foret/Agriculture	DEFORESTATION				
Sol nu / urbain					
Savane					

Segmentation at two levels

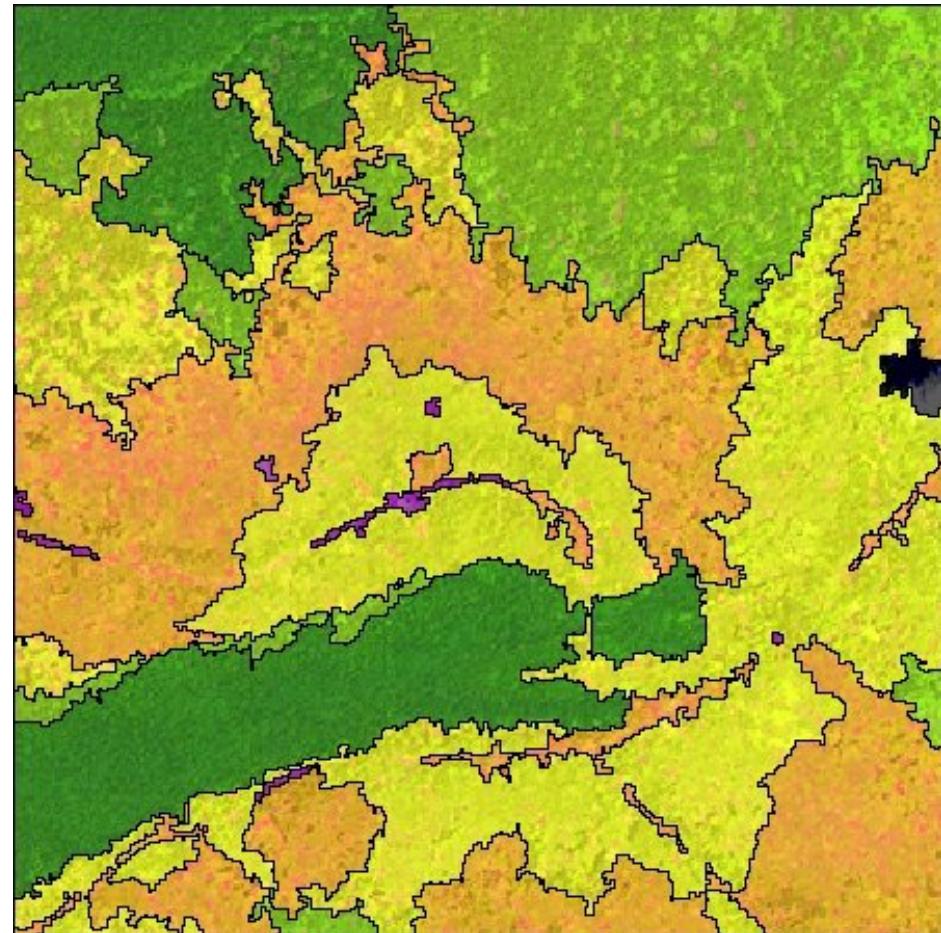




Edition by experts



Results



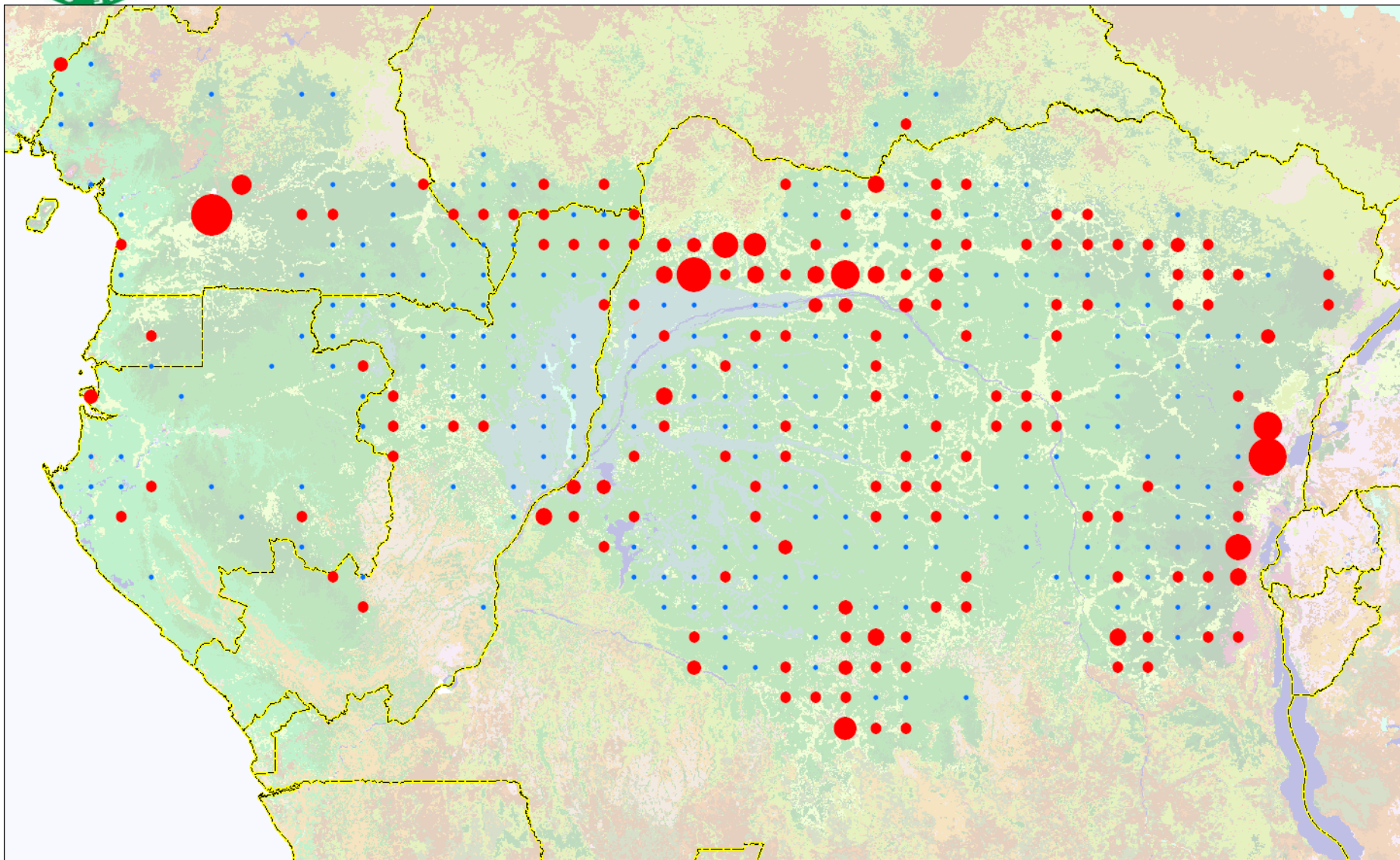


Advantages and limitations

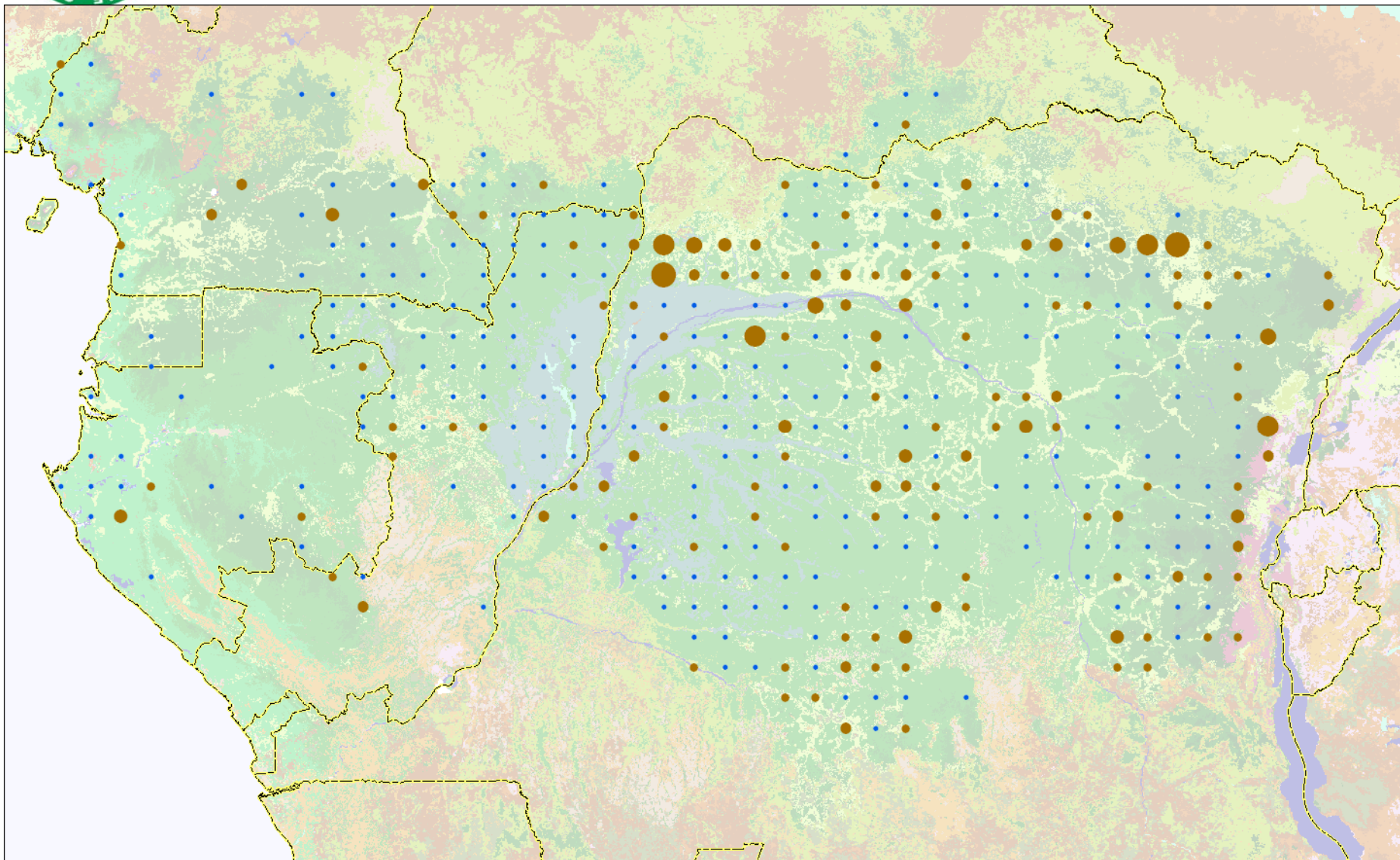


- Suffer from lack of data in coastal parts (radar)
- Sampling compatible with forest inventories, but affected by a sampling accuracy (to be documented)
- Segmentation can be applied out of the humid domain in similar ways, while purely spectral classifiers better work in humid zones; complementary with wall-to-wall (usually limited to forest / non forest)
- Polygons are compatible with forest management units. Other attributes than tree/canopy cover can be added by local experts.
- Easy to validate by national experts (polygon can be edited in simple GIS)

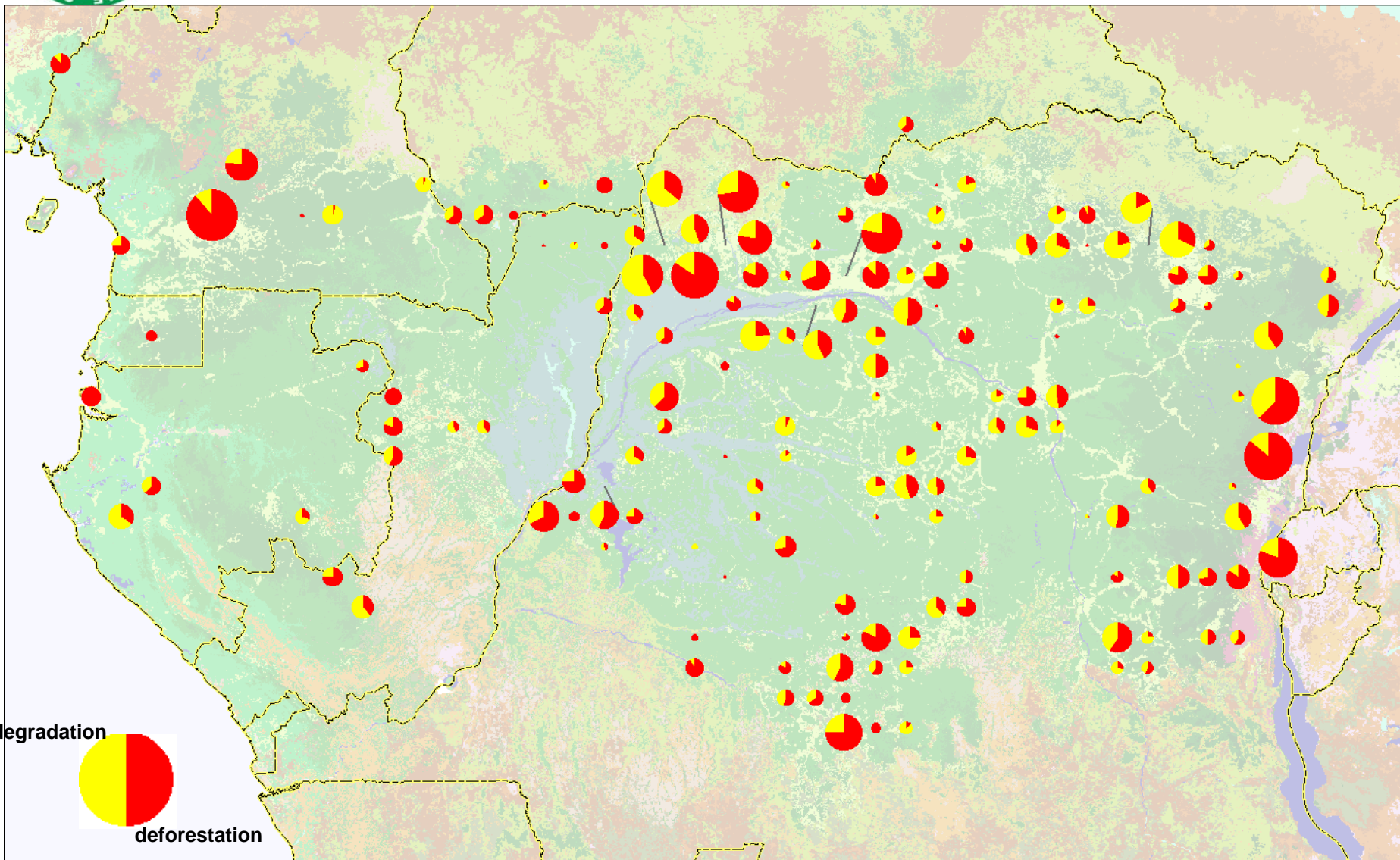
Deforestation



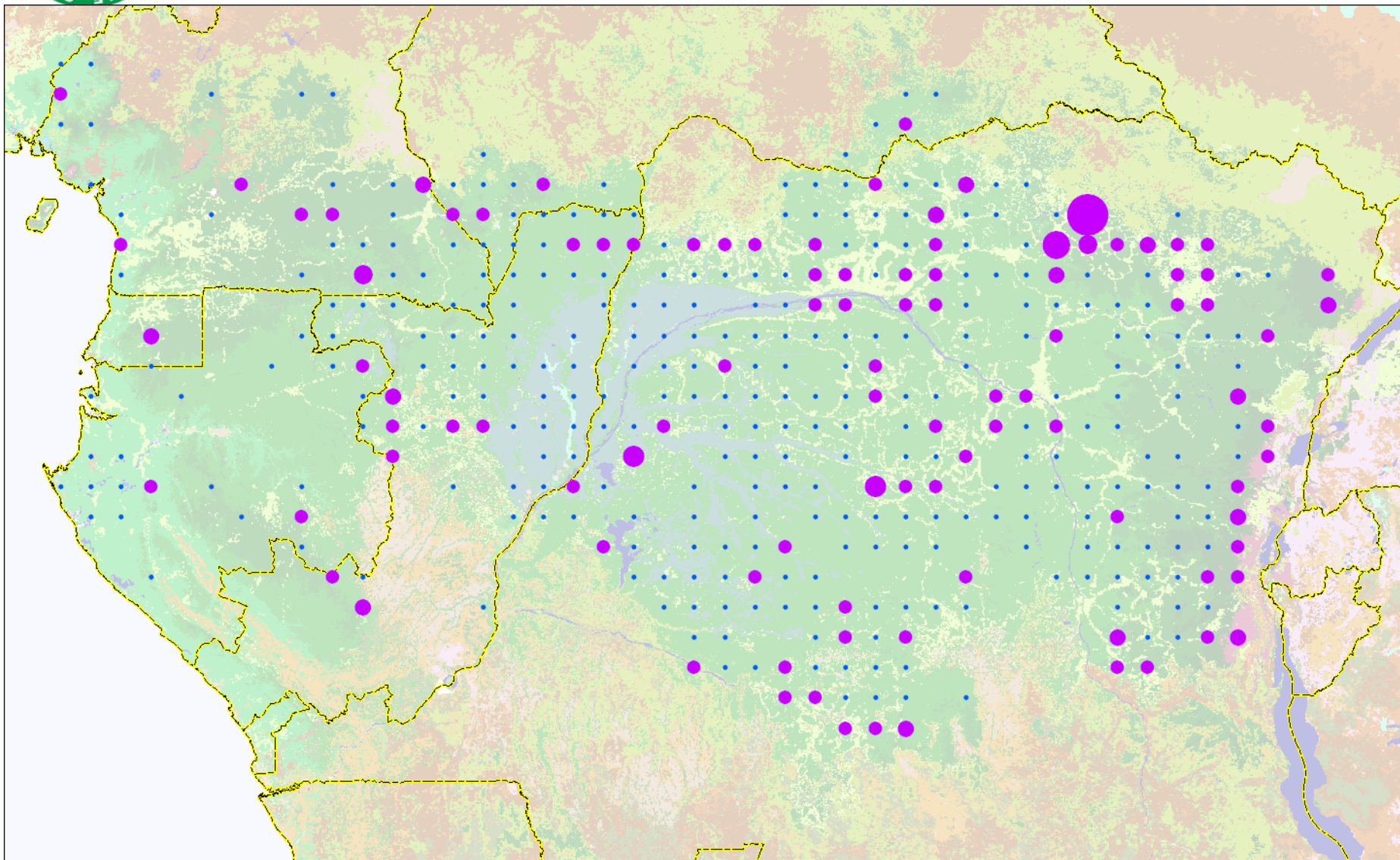
Degradation



Deforestation vs degradation

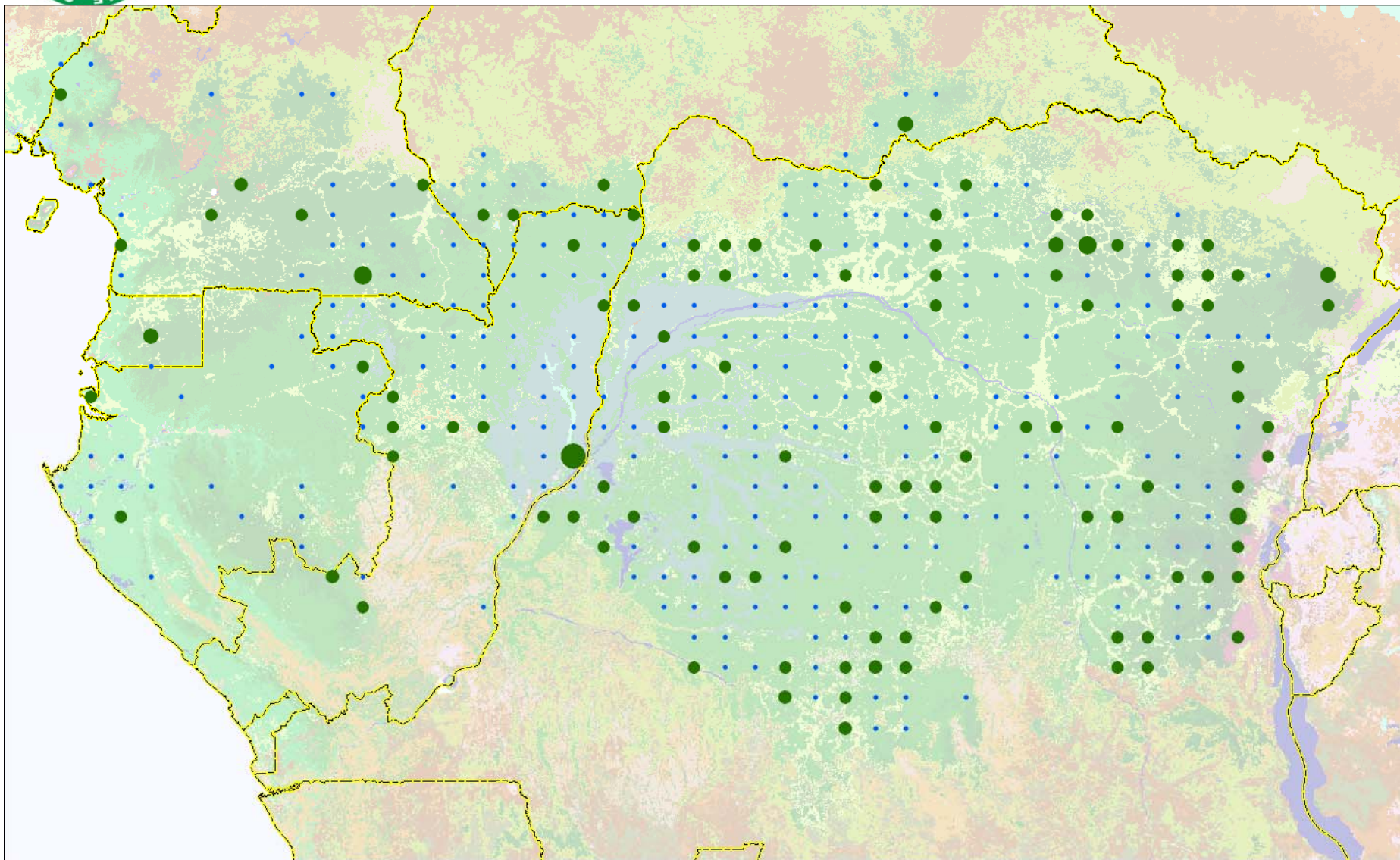


Regeneration



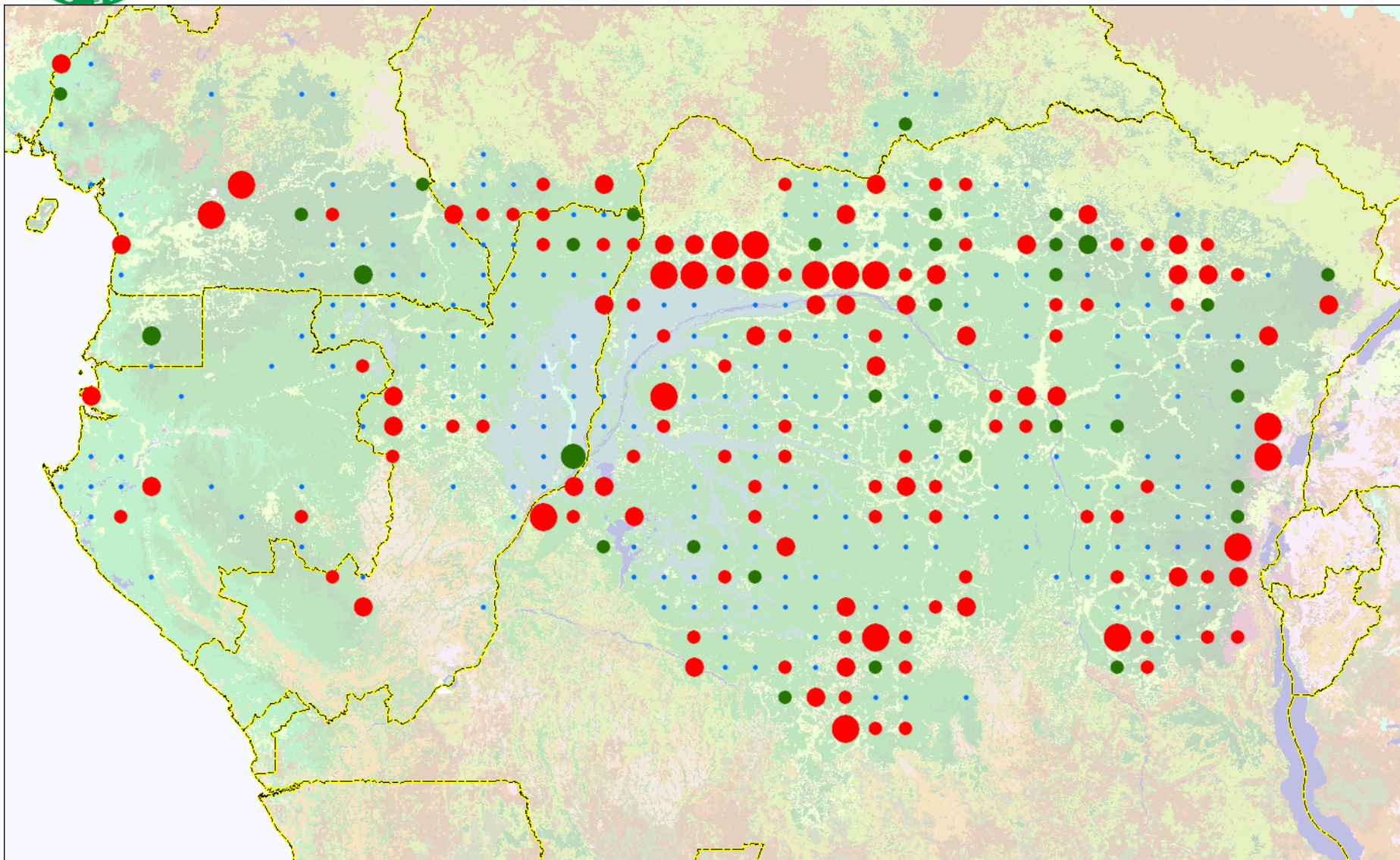


Reforestation





Net forest cover change





National estimates



	Cameroon *	CAR	D.R. Congo	Equat. Guinea	Congo	Gabon *	Central Africa
Gross Deforestation	-0,28%	-0,15%	-0,33%	-	-0,12%	-0,16%	-0,27%
Net Deforestation	-0,19%	-0,07%	-0,26%	-	-0,03%	-0,12%	-0,19%
Net Degradation	-0,02%	-0,02%	-0,15%	-	-0,01%	-0,09%	-0,10%
FAO Deforestation	-0,90%	-0,10%	-0,40%	-0,60%	-0,10%	0,05%	-0,36%

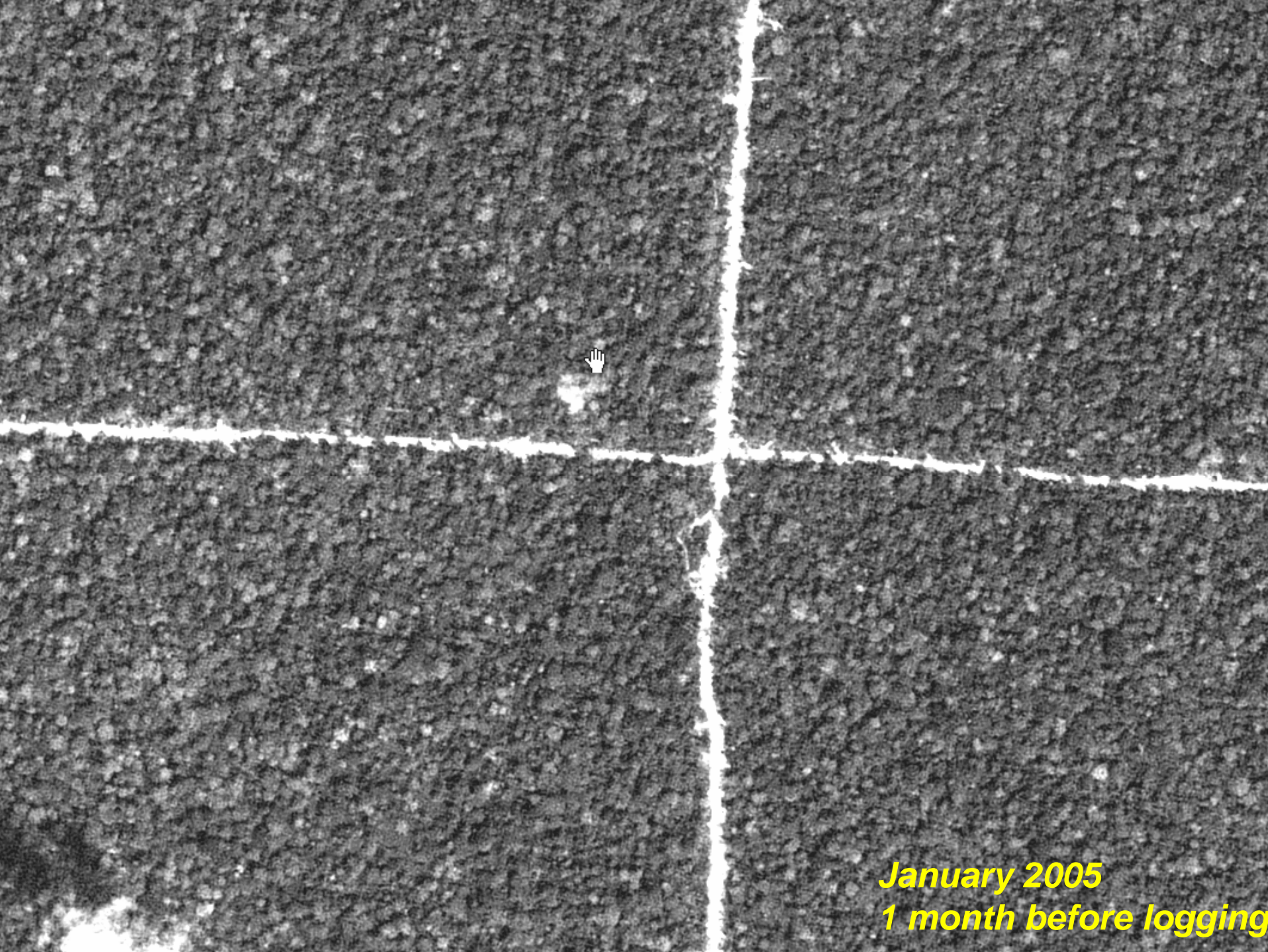
* Unreliable due to missing samples (cloud-cover)



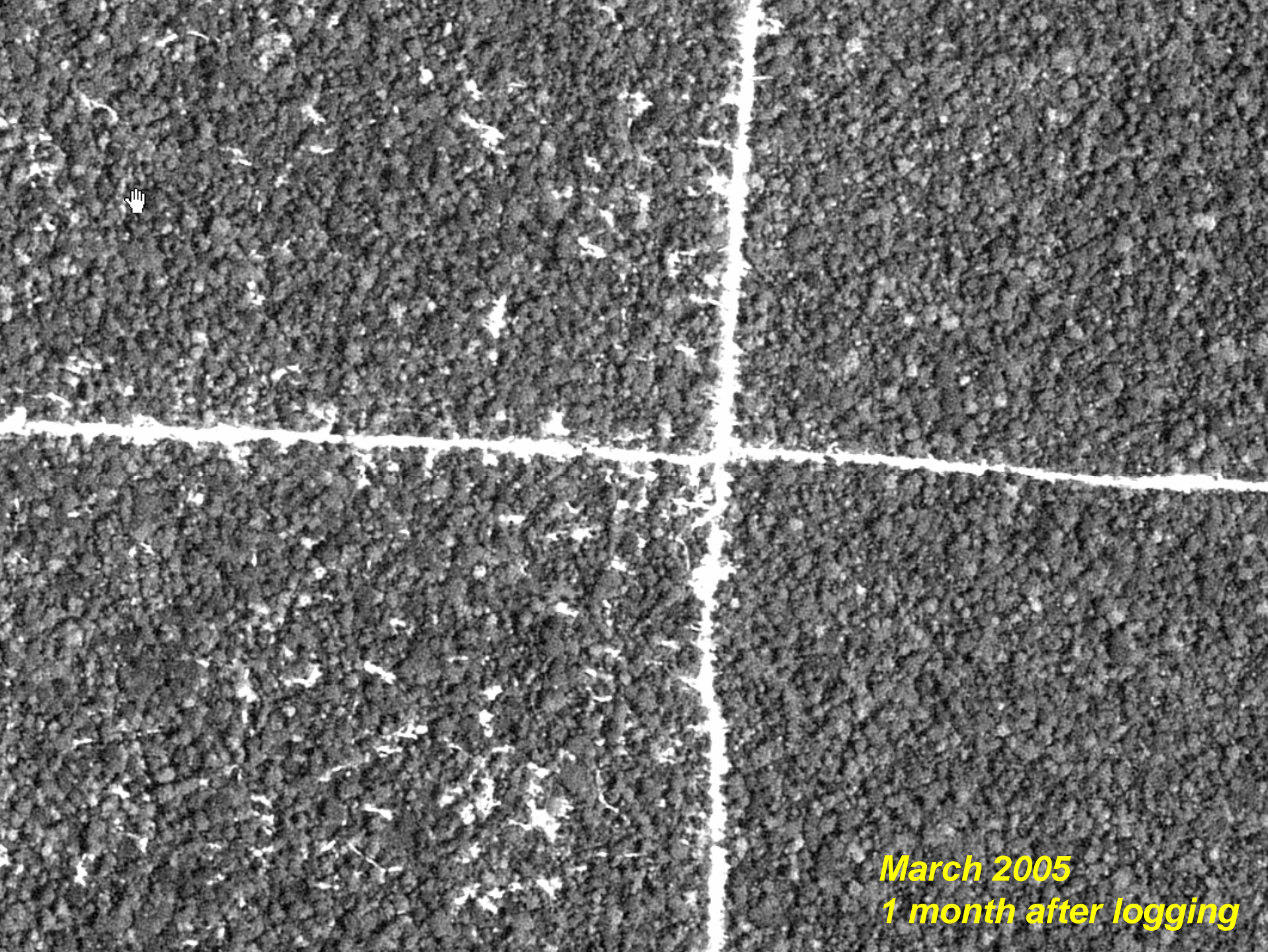
Situation in Central Africa



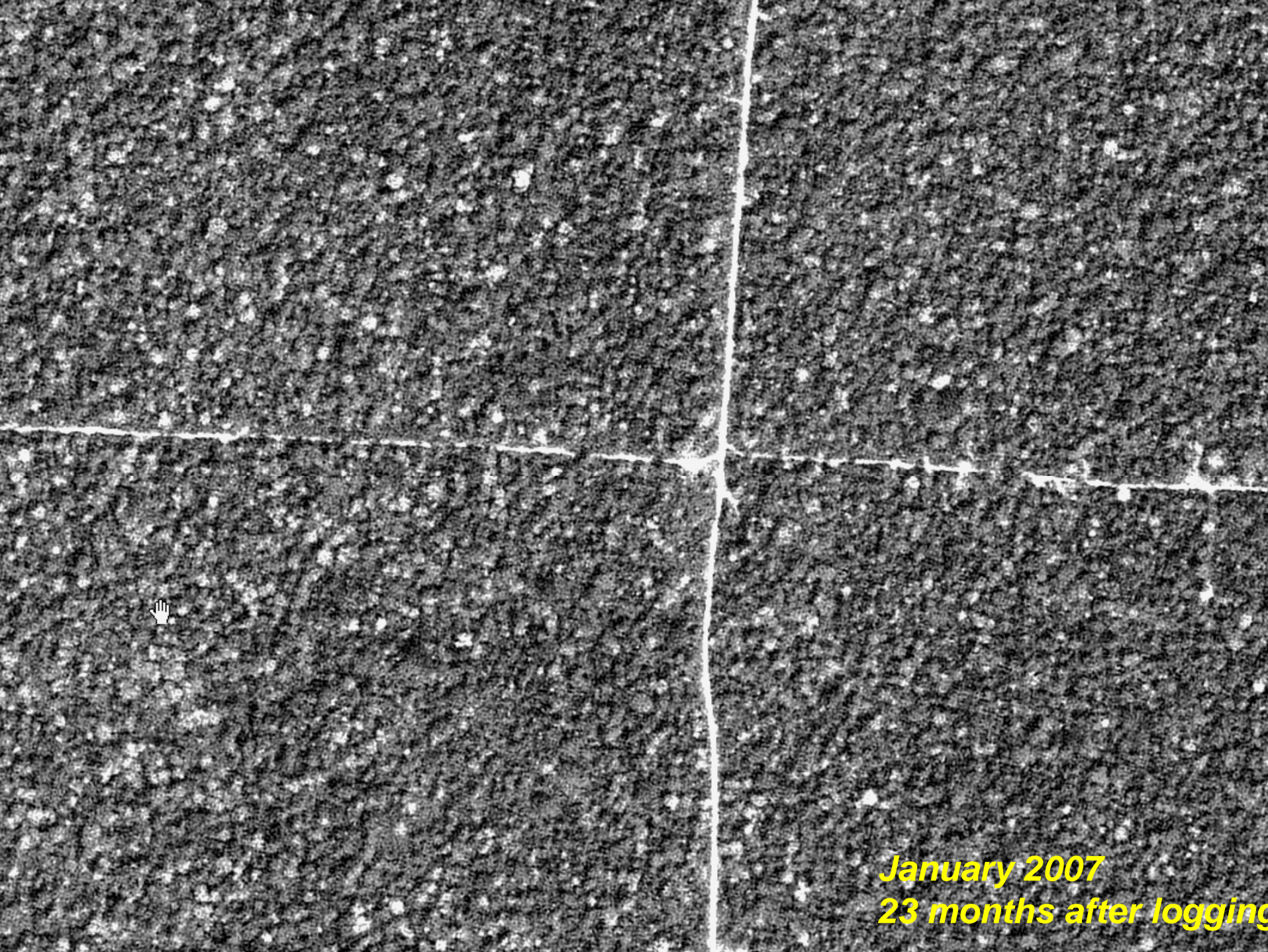
- Deforestation and degradation rate
 - Net Deforestation: 0.19% / yr
 - Degradation: 0.10% / yr
 - 4 x less than SEA and 2 x less than Amazon
- National patterns
 - DRC is highest
 - Congo, Gabon and CAR are very low
- Local patterns
 - Fringes of the Basin are more affected
 - Landscapes well protected (2x lower than out of landscapes)



January 2005
1 month before logging

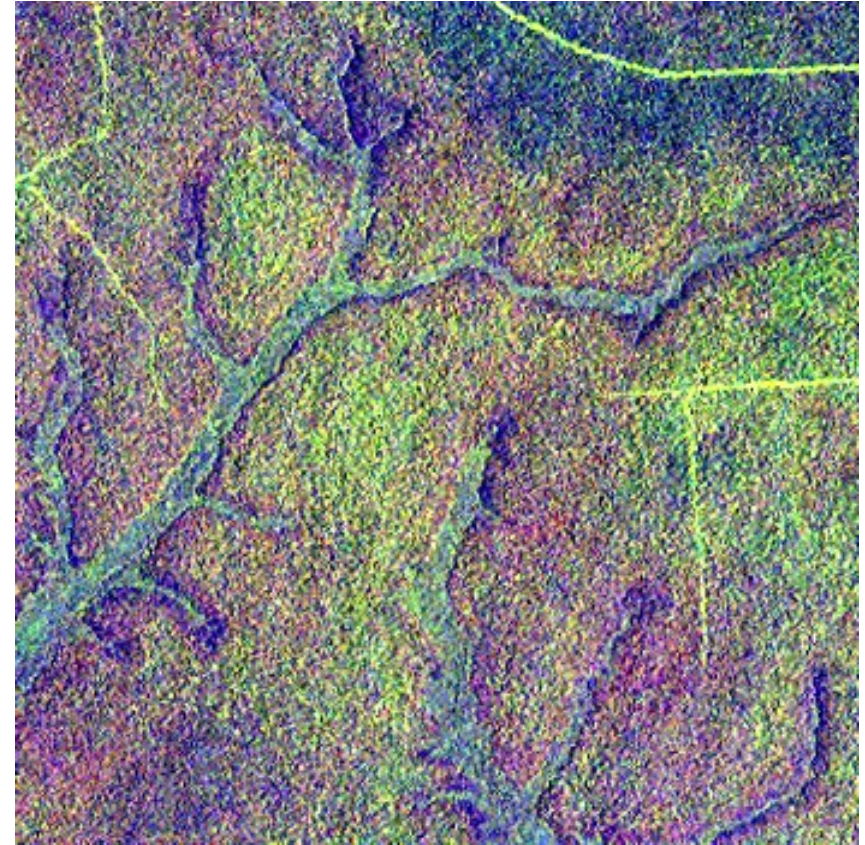
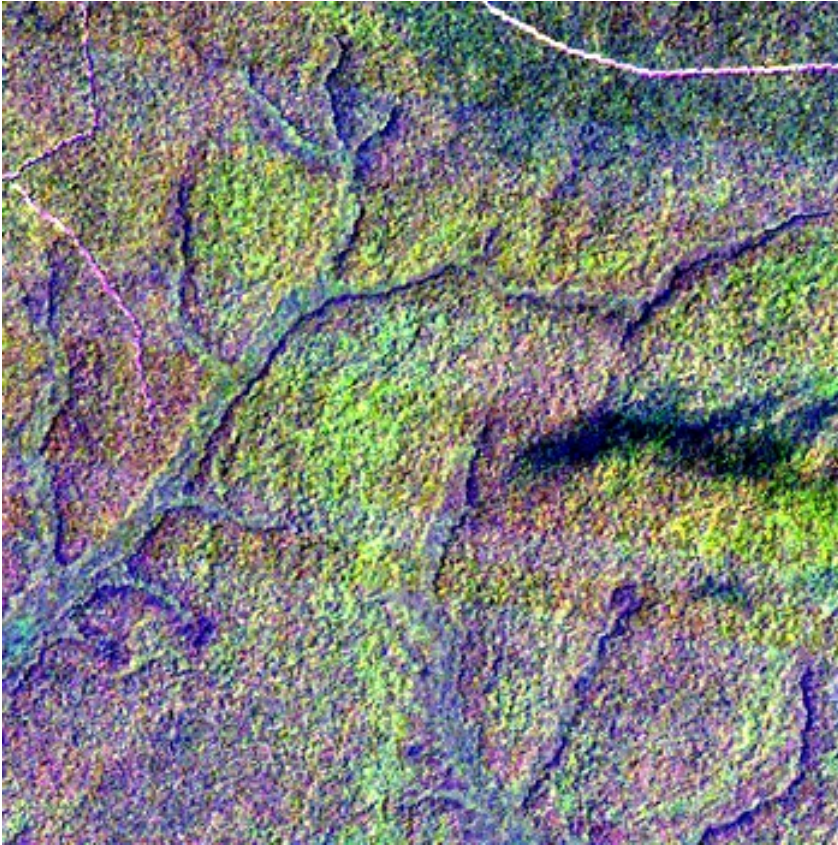


March 2005
1 month after logging



January 2007
23 months after logging

Logging with Landsat





Logging by Remote Sensing



- Sustainable logging does not cause long-term degradation of the canopy cover in the current conditions in Central Africa.
 - Conclusions can be different for the economic value, the floristic composition, the forest structure or the biomass, but not visible from satellite and must be evaluated by ground studies
- Roads are visible only a few years when properly managed by companies. The situation can be different if the control is lacking
- Link necessary with forest inventories; study on-going within OFAC

Observatoire des Forêts d'Afrique Centrale



Dr Philippe Mayaux

European Commission - Joint Research Centre

Pr Jonas Nagahuedi

COMIFAC



FORET
RESSOURCES
MANAGEMENT





Observatoire des Forêts d'Afrique Centrale



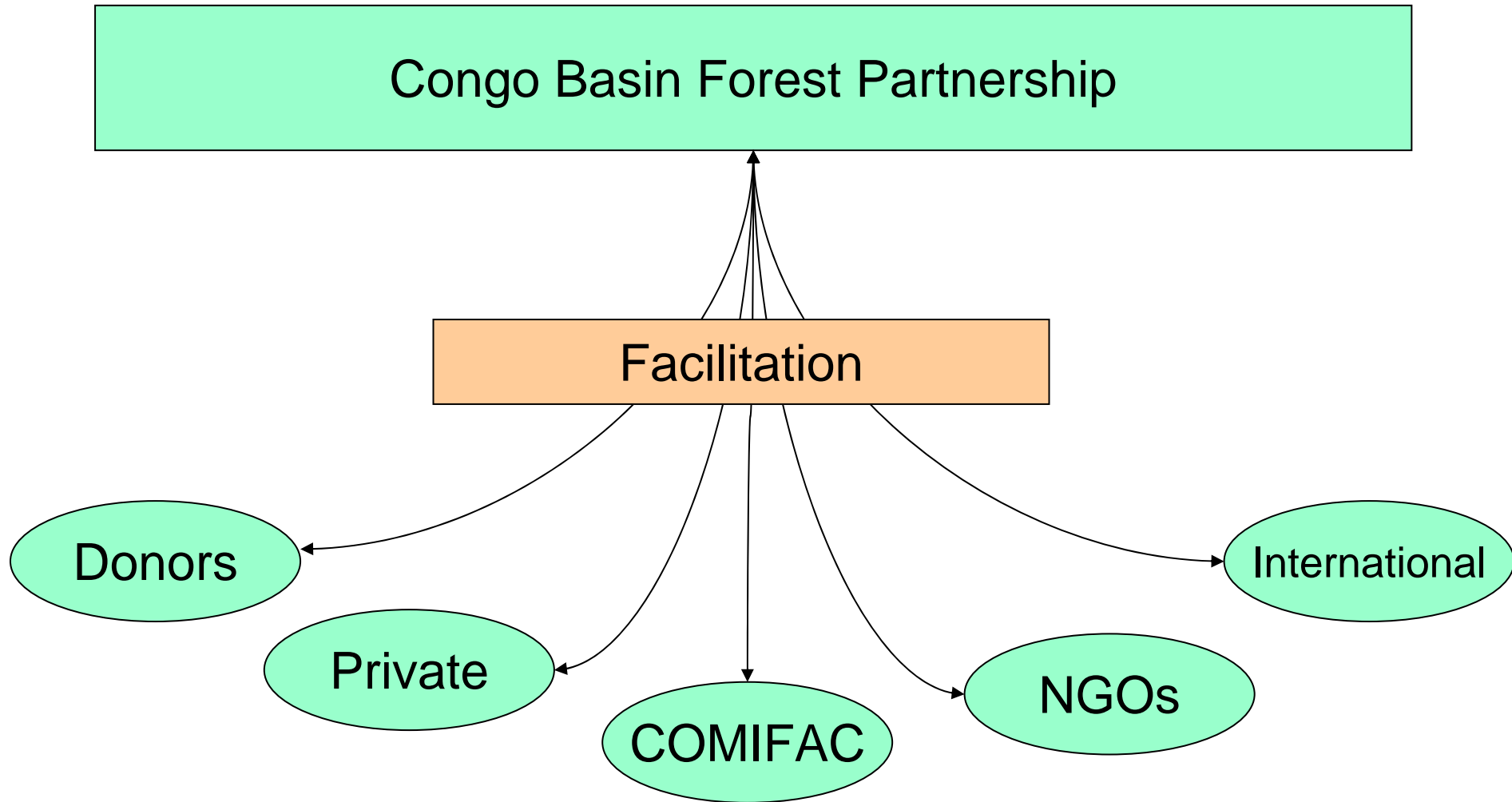
- Information needs are driven by policies
 - Climate (REDD, MDP), biodiversity (Target 2010), governance (FLEGT), biofuels
- Follow-up of the State of the Forests 2006
 - First time that so many stakeholders fully collaborate in a single consensual document
 - Need for a perennial structure
- Corresponds to the axis 2 of the COMIFAC “Plan de convergence”: Knowledge of the Resources.



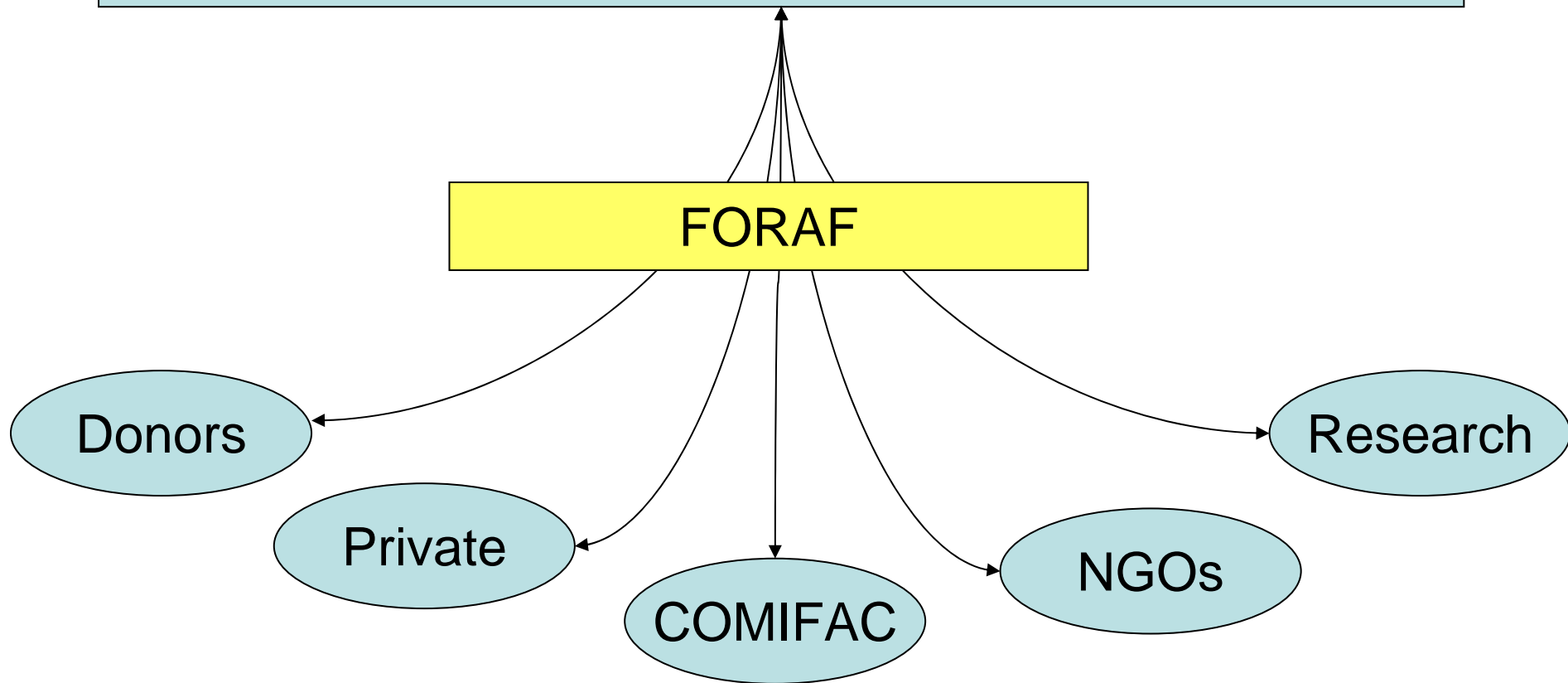
Observatoire des Forêts d'Afrique Centrale



- Under the political guidance of COMIFAC, in the frame of the Congo Basin Forest Partnership
- Working in close collaboration with all the partners of CBFP
 - COMIFAC, forest services, private sector, NGOs, donors, research institutions, training institutions
- The Observatory is a collective platform at the service of the Congo Basin stakeholders and does not belong to any particular partner



Observatoire pour les Forêts d'Afrique Centrale





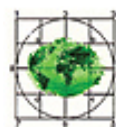
FORAF



- European contribution to the installation and the facilitation of OFAC
- Managed by the Joint Research Centre and the EC delegation in Kinshasa



- Achieved by a consortium of scientific institutions



FORET
RESSOURCES
MANAGEMENT



- Regional centre in Kinshasa (5 scientific staff) with contact points in the different Congo Basin countries



Partners of the Observatory



Partenaires institutionnels

Partenariat
pour les Forêts
du Bassin du
Congo (PFBC)



COMIFAC



RIFFEAC



RAPAC



IFIA

Partenaires financiers



Commission Européenne



France



Allemagne



USAID
FROM THE AMERICAN PEOPLE

Etats-Unis



Belgique



Royaume-Uni



Banque Mondiale



Technical partners



Partenaires techniques



OSFAC



Global Forest Watch



WORLD
RESOURCES
INSTITUTE

World Resources Institute



World Wildlife Fund



Wildlife Conservation
Society



AFRICAN WILDLIFE FOUNDATION®

African Wildlife Foundation



Conservation International



South Dakota State University





Activities and expected results



- Reference center on Central Africa forests
 - Biophysical context: soil, terrain, climate, vegetation, fauna, biomass...
 - Socio-economic information: export, transformation, economic parameters and social impact
 - Institutional dimension: laws, training and management institutions, projects
- Operational and continuous monitoring systems
- Dynamic mechanism of regional Observatory



Monitoring systems



- Systems dedicated for monitoring
 - Forest cover
 - Forest logging
 - Biodiversity conservation and environmental services
- Three levels of data collection and analysis
 - Regional: synthesis of indicators for the region
 - National: analysis of indicators by country
 - Local: indicators by site (logging concession, transformation unit, protected area, game area...)
- Quantitative indicators in the formal sector, studies in the informal market



Indicators at national level



- Legal and institutional frame
 - Laws and rules
 - Institutional capacity
- Forest cover
 - Forest area (total and by type of forests)
 - Deforestation rates 1990-2000 and 2000-2005
- Forest logging
 - Economical evaluation of the sector, production, exportation and transformation statistics
 - Logging concessions, Community forests
- Biodiversity conservation
 - Species richness, endemism and evolution
 - Protected areas, environmental services

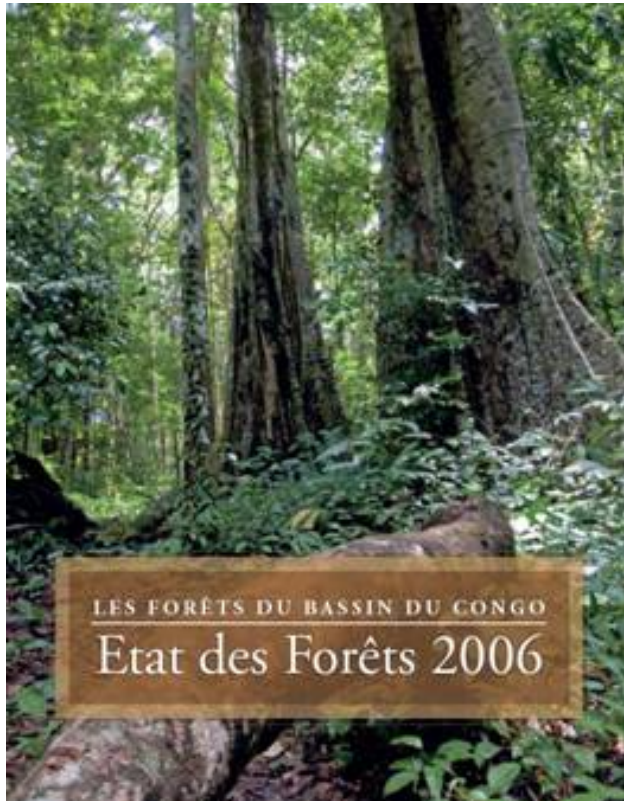


Regional mechanism



- Validation by COMIFAC countries and CBFP partners
 - of the choice of indicators (Kribi, February 2008)
 - of the procedures of data collection and analysis
 - of the quality of estimators
- Capacity-building
 - for data collection and validation
 - for use of environmental information
- Perennial regional structure for the Observatory
 - Under the guidance/mandate of COMIFAC
 - Dynamic and trusted by all partners
 - Necessary for political processes

Reports, studies



Web site with exhaustive information



State of the Forests

<http://www.observatoire-comifac.net>

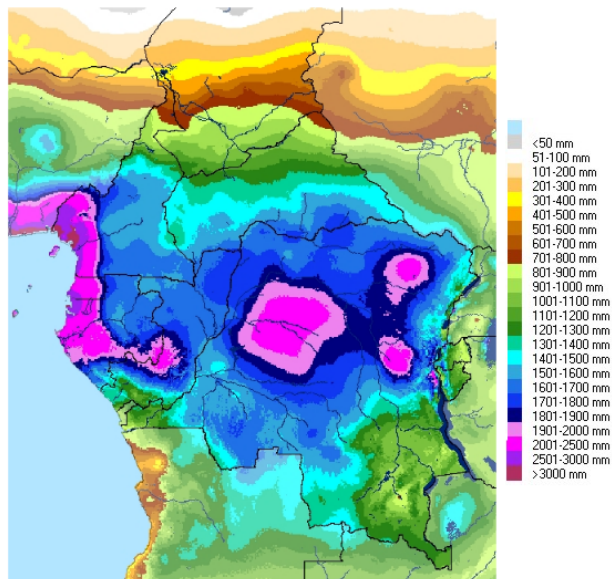
Choisissez une donnée contextuelle:

Pluviométrie

Pluviométrie

Les précipitations annuelles moyennes en Afrique centrale sont maximales en bordure immédiate du golfe de Guinée : 3000 mm à Libreville, 3200 mm à Bata, 3400 à Douala, 6000 mm dans la partie sud de l'île de Bioko et près de 12000 mm à Debunscha sur le piémont sud-ouest du mont Cameroun. Vers le sud la pluviométrie diminue cependant rapidement : à hauteur de l'embouchure du fleuve Congo, elle est inférieure à 1000 mm.

A distance de la côte, la majeure partie des forêts humides de la cuvette du Congo reçoit entre 1700 et 2000 mm de précipitations. Des zones de plus fortes précipitations sont centrées à hauteur de l'équateur sur le massif du Chaillu, le centre de la cuvette et le bord oriental de la cuvette. A distance de l'équateur la pluviométrie diminue pour tomber à moins de 1000 mm à proximité du lac Tchad dans le nord du Nord-Cameroun, dans le nord-est de la République centrafricaine et certaines zones du sud-est de la RDC. Dans le fossé du rift Albertin, existent également des zones fort arides à hauteur des lacs Albert, Edouard et Tanganyika.



Source

Leroux, M., 1983. Le climat de l'Afrique tropicale. Champion, Paris

Sites complémentaires

<http://tao.atmos.washington.edu/data/willmott/africa>
<http://cres.anu.edu.au/outputs/africa.html>

Last Mod: 18 October 2007

Classe: amphibiens

Famille: arthroleptidae

Classe: amphibiens -> Famille: arthroleptidae

Nom	SC	CF	BA	STP	Cam	RCA	GE	Gab	Con	RDC
Arthroleptis adolfriederici (Nieden, 1910)					x					x
Arthroleptis hematogaster (Laurent, 1954)	E									x
Arthroleptis lameerei (Witte, 1921)										
Inclus: <i>Schoutedenella muta</i> (Witte, 1933)										x
Arthroleptis loveridgei (Witte, 1933)	E									x
Arthroleptis phrynoides (Laurent, 1976)	E									x
Arthroleptis pyrrhocelis (Laurent, 1952)	E									x
Arthroleptis schubotzi (Nieden, 1910)										
Inclus: <i>Schoutedenella discodactyla</i> (Laurent, 1954)										x
Sous-espèces: <i>Arthroleptis s. kivuensis</i> (Witte, 1941)										
Arthroleptis spinalis (Boulenger, 1919)										
Inclus: <i>Arthroleptis boulengeri</i> (Witte, 1921)	E									x
Arthroleptis stenodactylus (Pfeffer, 1893)										
Inclus: <i>Phrynobatrachus whytii</i> (Boulenger, 1897)										x
Arthroleptis poecilonotus (Peters, 1863)										
Inclus: <i>Arthroleptis macrodactylus</i> (Boulenger, 1882) <i>Arthroleptis inguinialis</i> (Boulenger, 1900)		B			x			x	x	x

Last Mod: 18 October 2007



An Observatory with and for all



- The Observatory for Central African Forests will create a consensus for the region at a few conditions:
 - Large participation and support by COMIFAC and national administrations, private sector, NGOs for accessing the needed information
 - Large participation and open co-operation of the scientific community for ensuring robust and high-quality analysis
 - International recognition in the global debate: carbon, biodiversity, forest governance
- We need all the contributions and a joint consolidation of the results

<http://www.observatoire-comifac.net>



Overall conclusions



- Mechanism in place for regional assessments
 - Regional co-operation for political analysis existing
 - Must be transferred to monitoring capacities
 - Capacity-building needed
- Deforestation / degradation estimates exist and are robust
 - Complementary techniques for RS component
 - Lack of integration with field data (inventories)
- SFM does not lead to degradation and should be seen as complementary of conservation