COP-15 UNFCC – Copenhangen 2009

REDD issues in the Congo Basin:
towards an operational
Observatory for Central African forests

Forest area changes at national and regional level derived from remote sensing: first estimates between 1990, 2000 and 2005

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In close collaboration with JRC, SDSU and FAO

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Critical information needs

- Reliable and up-to-date for governments

  to define and monitor forest policies

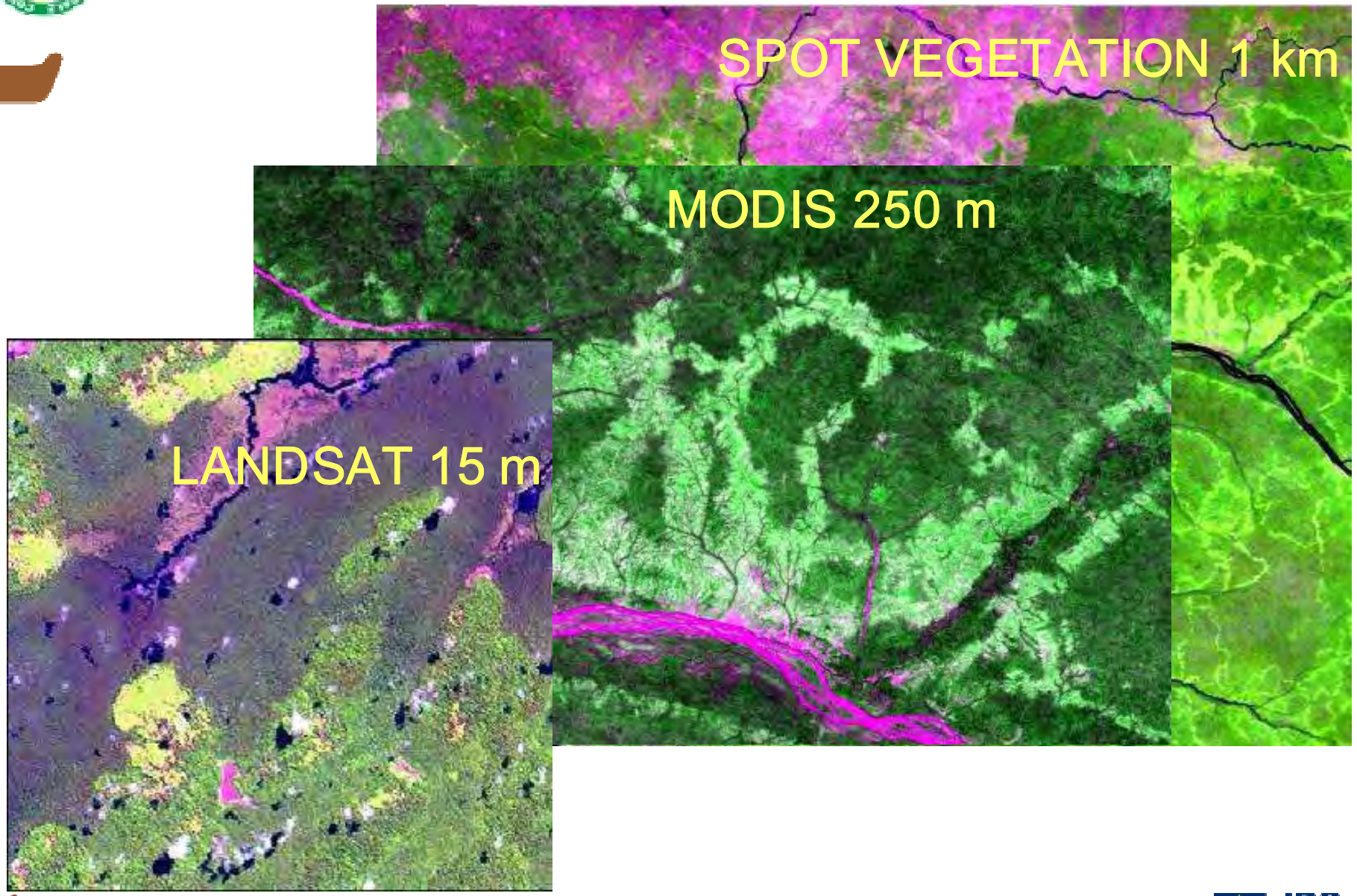
  (Plan de convergence – CBFP framework)

- Objective and verifiable according to int. standards for the global community

  to report to international conventions

  (UNFCC, Biodiversity Convention, REDD Initiative, …)

Adequate Earth Observation technologies



Maturity of EO pratices

- **Maturity of scientific methods** for
  - standard processing of satellite observation
  - forest types definition (FAO-LCCS)
  - forest types mapping
  - forest cover change detection (GOFC-GOLD)

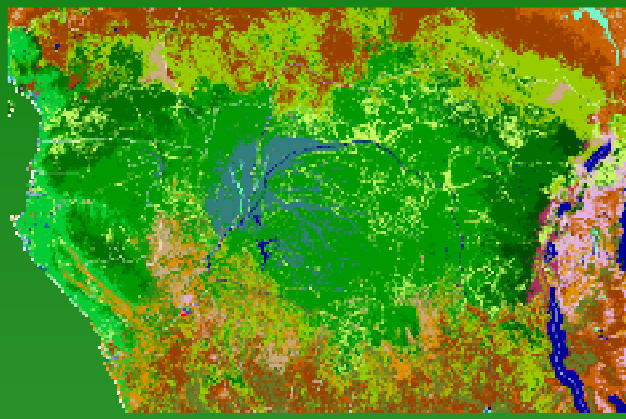
- **High speed computing capabilities** for
  - large volume data acquisition and management
  - mass volume processing in a repeatable way

OFAC - an efficient Partnership

- Administrations and national experts
- Regional technical office (EU-FORAF)
- International scientific community
  - EU-Joint Research Center (JRC)
  - University of Maryland (UMd-Carpe)
  - South Dakota State University (SDSU)
  - Université catholique de Louvain (UCL)
- FAO-Forest Resources Assessment 2010

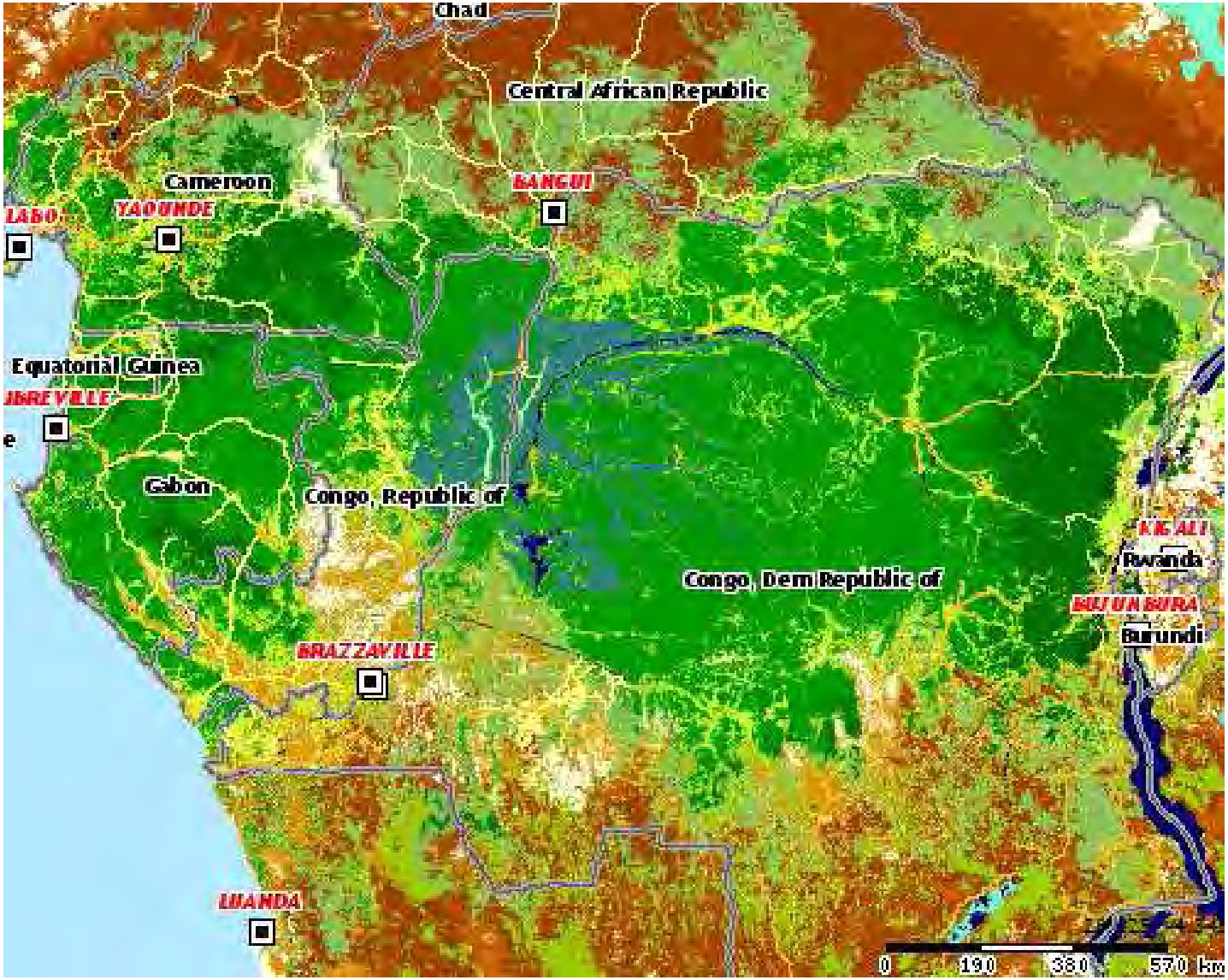
⇒**for a collaborative and consolidated forest assessment** (SOF 2006, 2008 and 2010)

Operational results: basin-wide forest type map at 300 m



From SPOT VEGETATION 2000 data

Operational results: basin-wide forest type map at 300 m



Vegetation Map

- Lowland rain Forest
- Semi-mountain Forest
- Mountain Forest
- Swamp Forest
- Mangrove
- Rural Complex
- Forest-Savanna Mosaic
- Miombo Woodland
- Woodland and Tree Savanna
- Shrubland
- Grassland
- Other Vegetation

Roads

- Primary paved roads
- Primary roads (permanent or random practicability)
- Secondary paved roads (permanent or random practicability)
- Secondary roads (intermittente practicability)

Cities

- COUNTRY CAPITAL
- over 500.000
- 500.000 - 200.000
- 200.000 - 50.000

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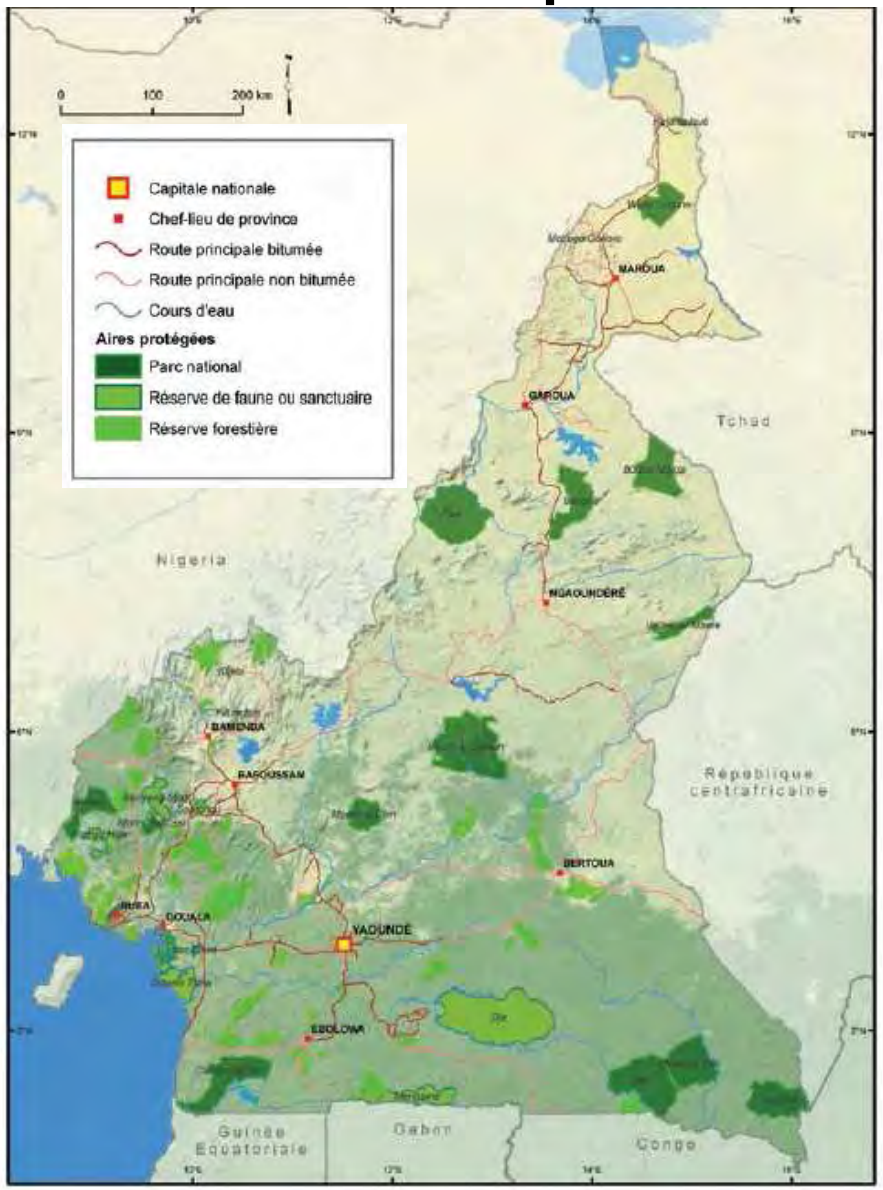
Operational results: basin-wide forest types area estimate

Land cover class	Area (km²)	% Sub Region
Closed evergreen lowland forest	1.421.834	35
Submontane forest (900-1500m)	63.100	2
Montane forest (> 1500 m)	9.754	0
Swamp forest	123.264	3
Mangrove	1.926	0
Total humid forest	**1.619.879**	**40**
Mosaic forest/croplands	370.123	9
Mosaic forest/Savannah	588.011	15
Closed deciduous forest	304.808	8
Deciduous woodland	630.890	16
Open deciduous shrub land, sparse trees	301.220	7
Others	233.540	6
TOTAL Sub region (Congo Basin)	**4.048.470**	**100**

Operational results: national land allocation maps



Source : WRI et FEDAFOR

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oraf

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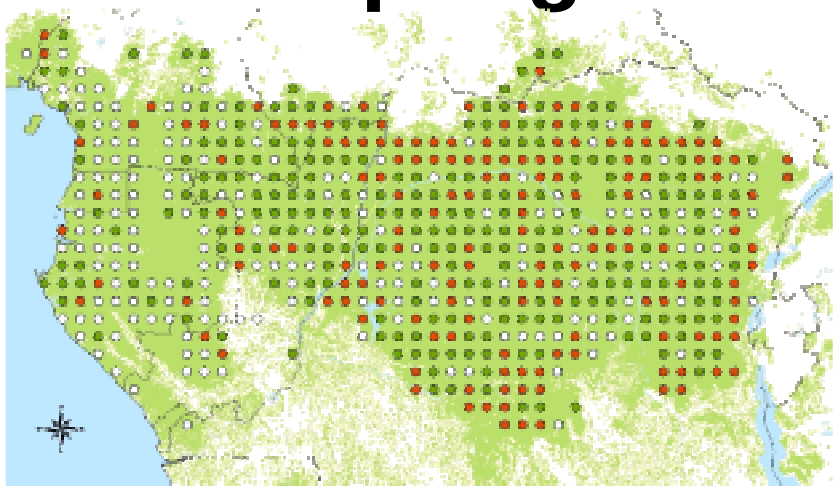
Operational results: forest cover change detection

forest change estimate

derived from 2 distinct approaches

sampling



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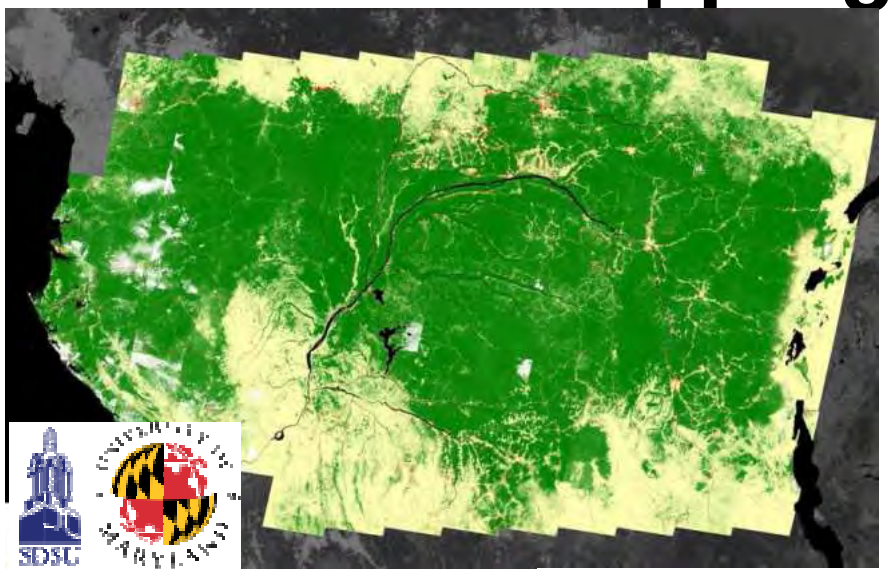
wall-to-wall mapping



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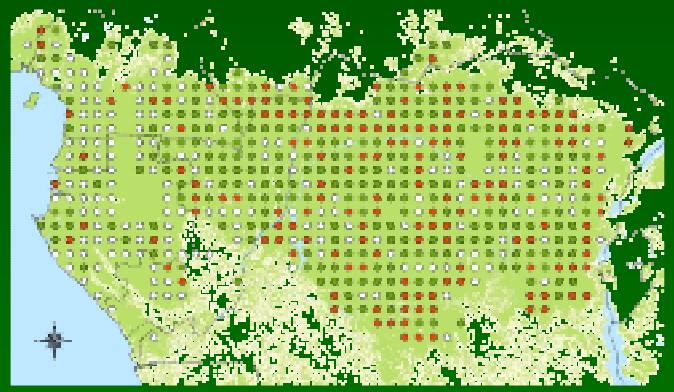
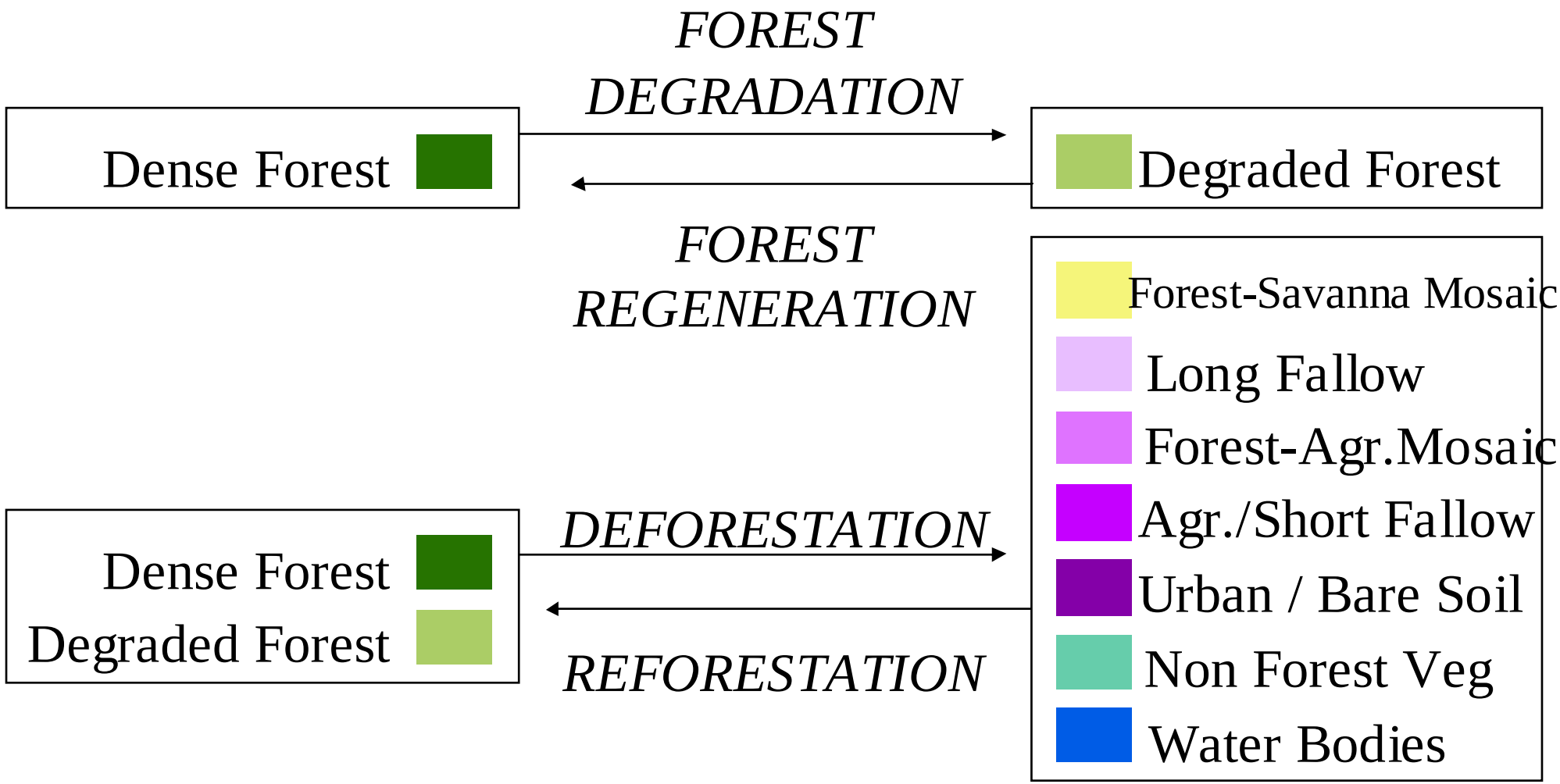
Operational results: forest cover change detection

Synthesis

for forest cover estimate 1990-2000



Pilot results: forest cover change detection

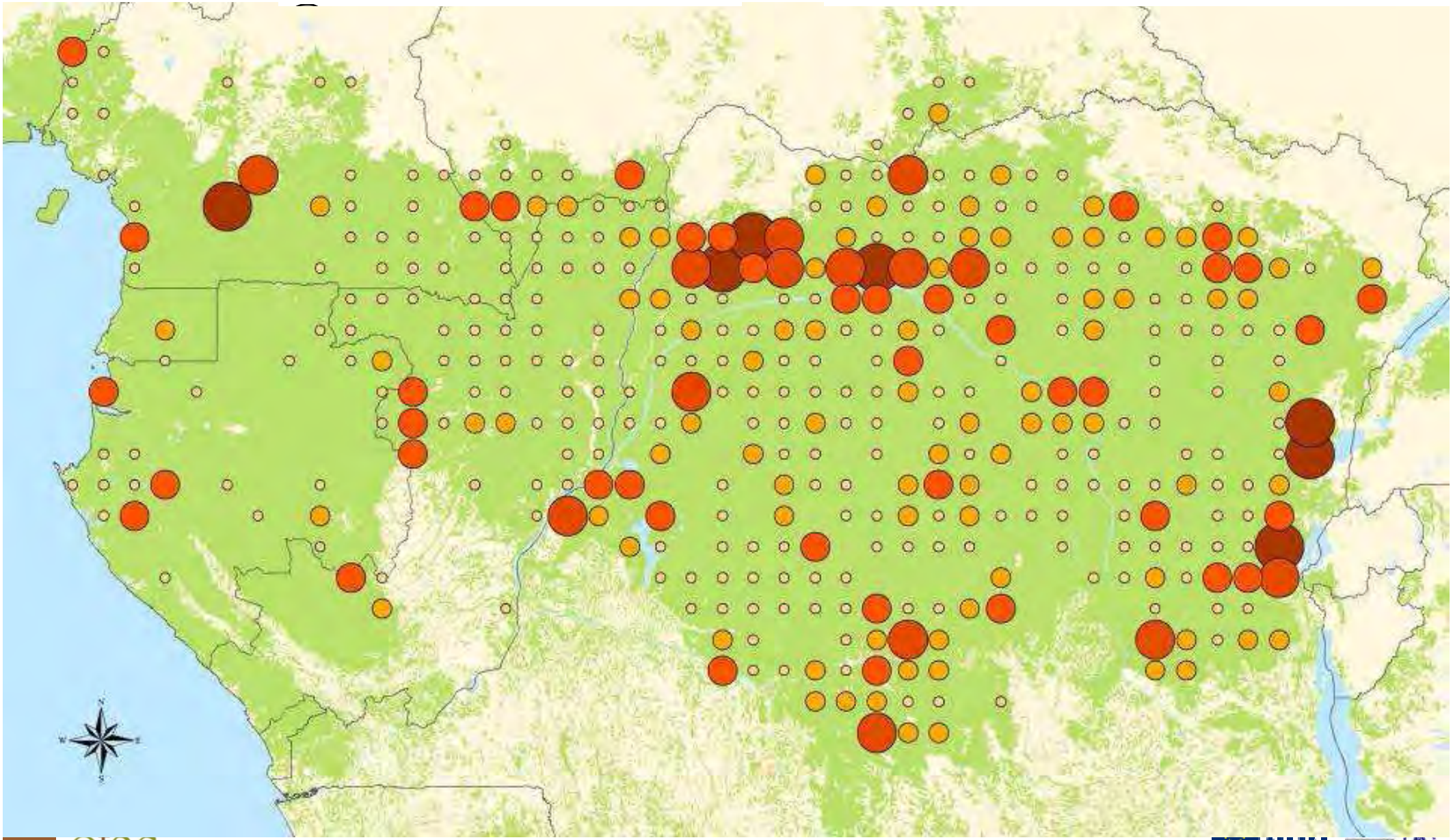


SPATIAL DISTRIBUTION OF FOREST COVER CHANGE PROCESSES

Changed area per sample [ha]

- < 50
- 50 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000

DEFORESTATION



SPATIAL DISTRIBUTION OF FOREST COVER CHANGE PROCESSES

Changed area per sample [ha]

- < 50
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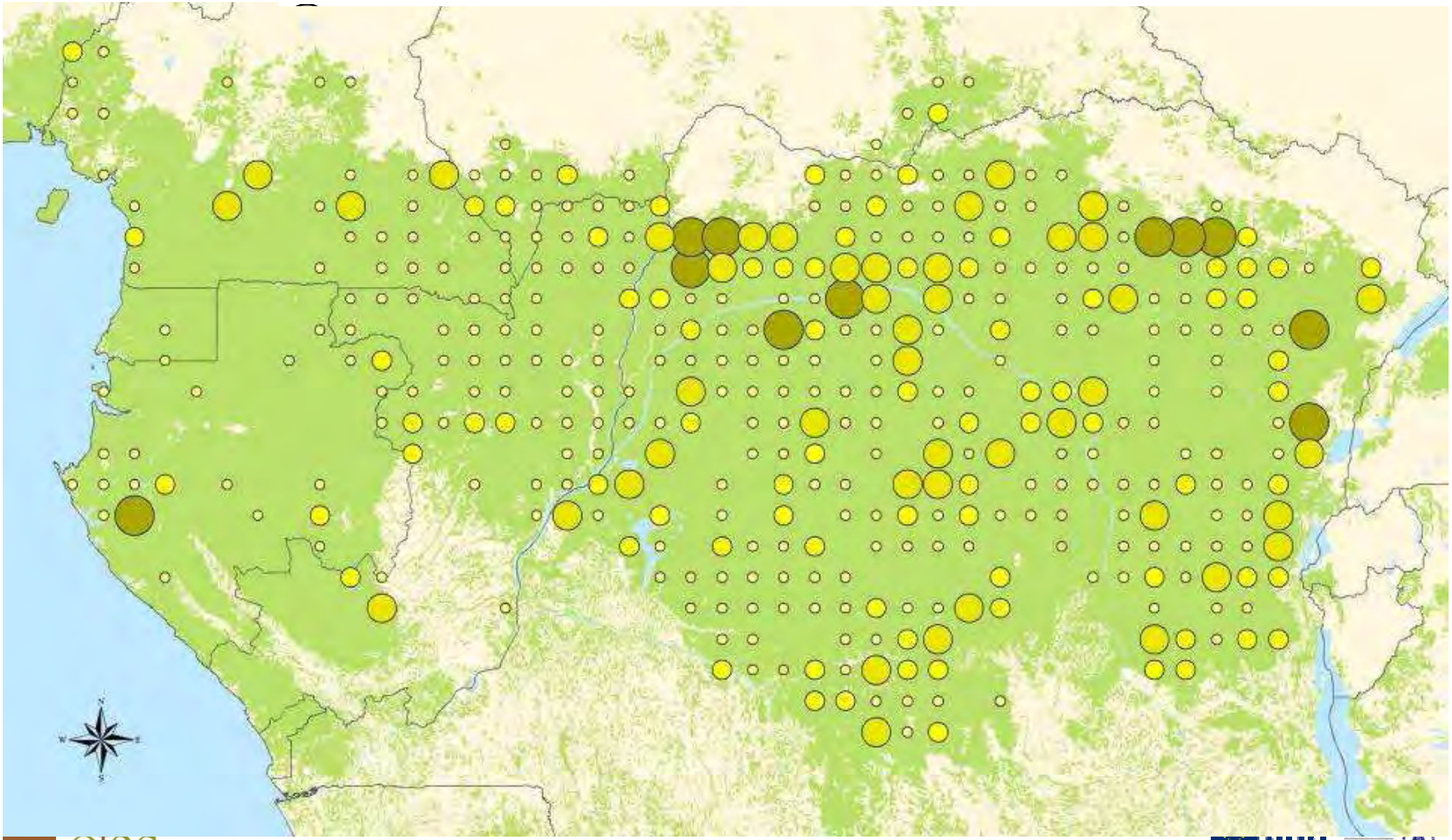
- 2500 - 5000

FOREST DEGRADATION



SPATIAL DISTRIBUTION OF FOREST COVER CHANGE PROCESSES

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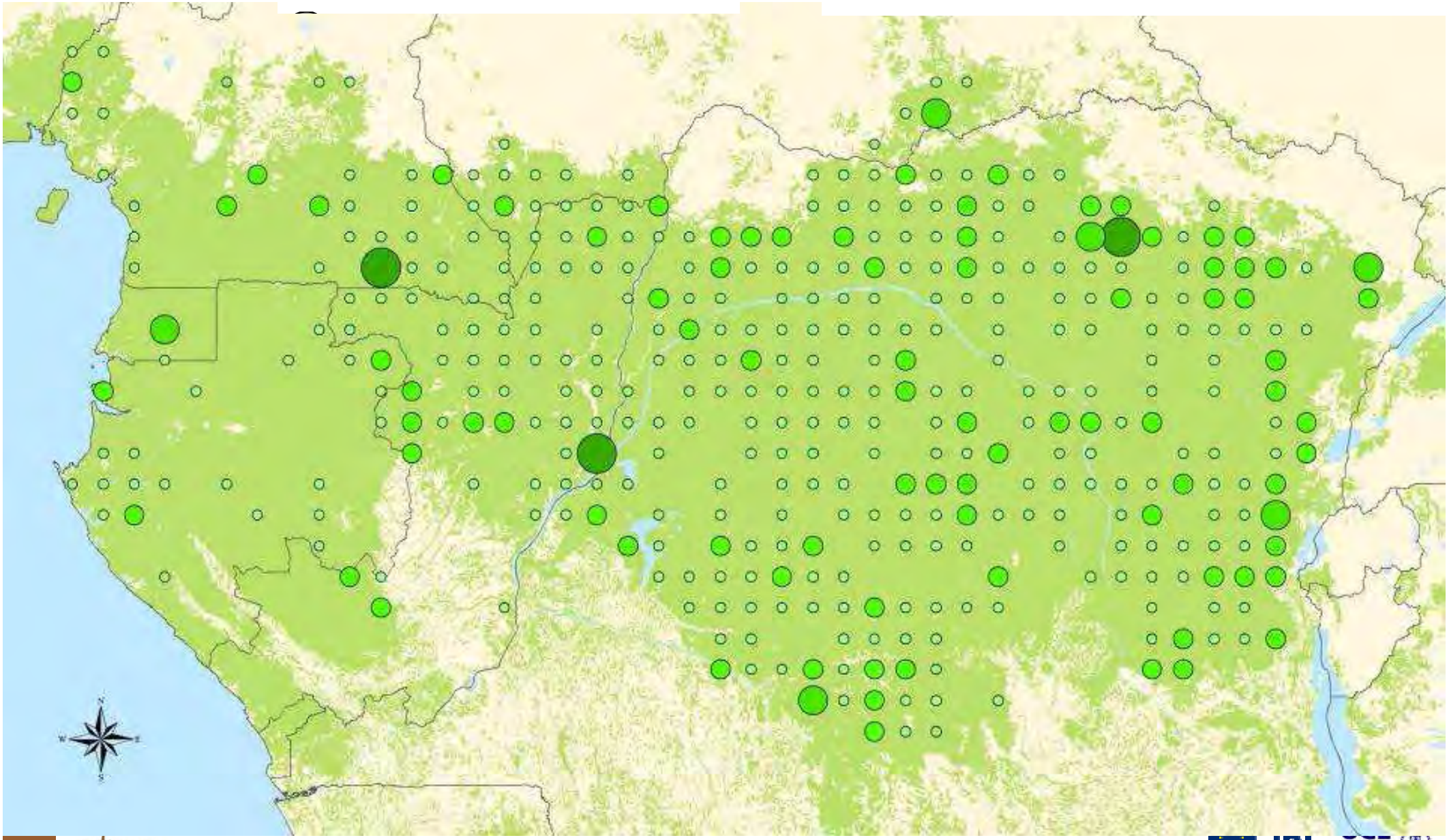
REFORESTATION



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SPATIAL DISTRIBUTION OF FOREST COVER CHANGE PROCESSES

Changed area per sample [ha]

- < 50
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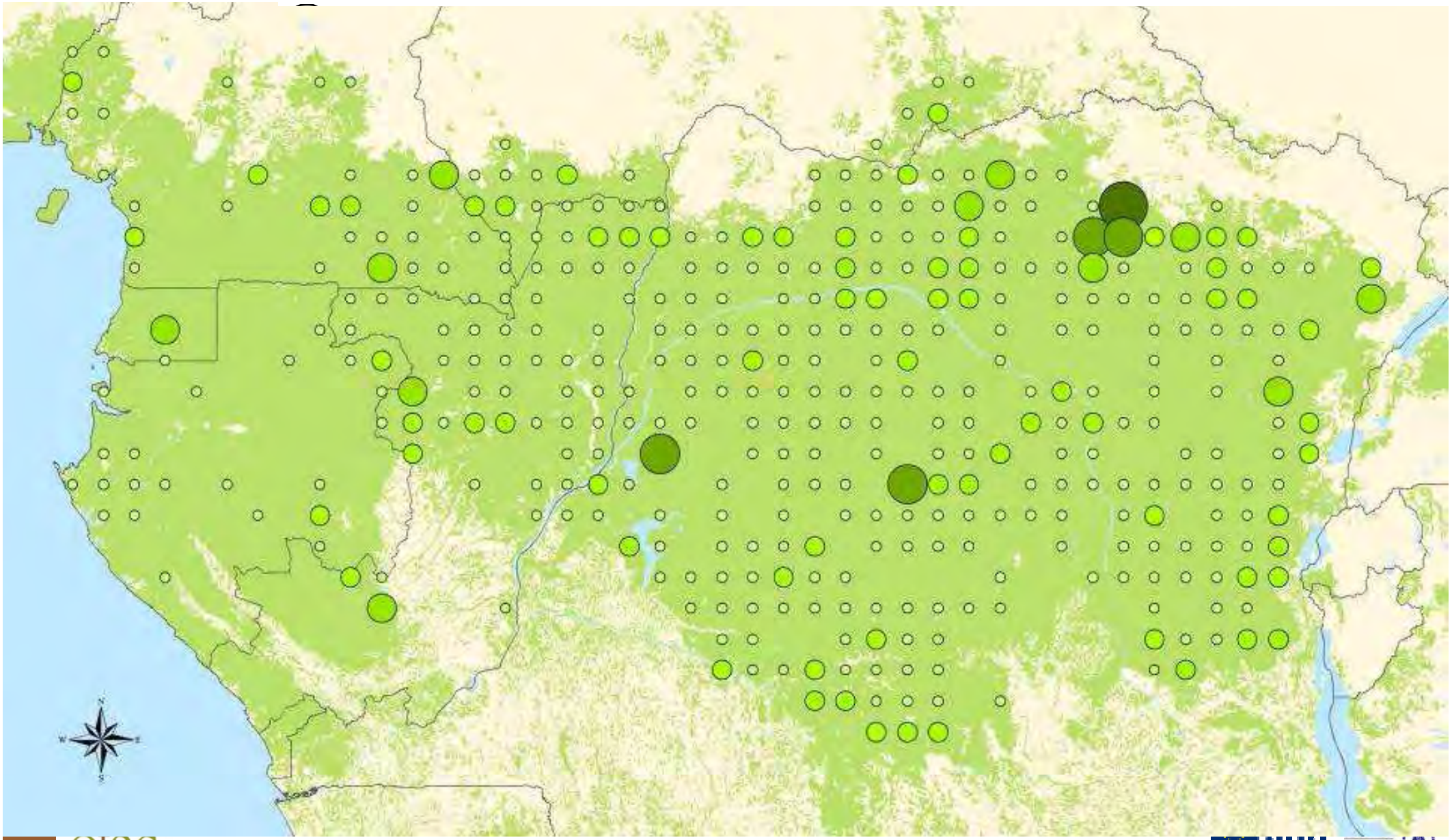
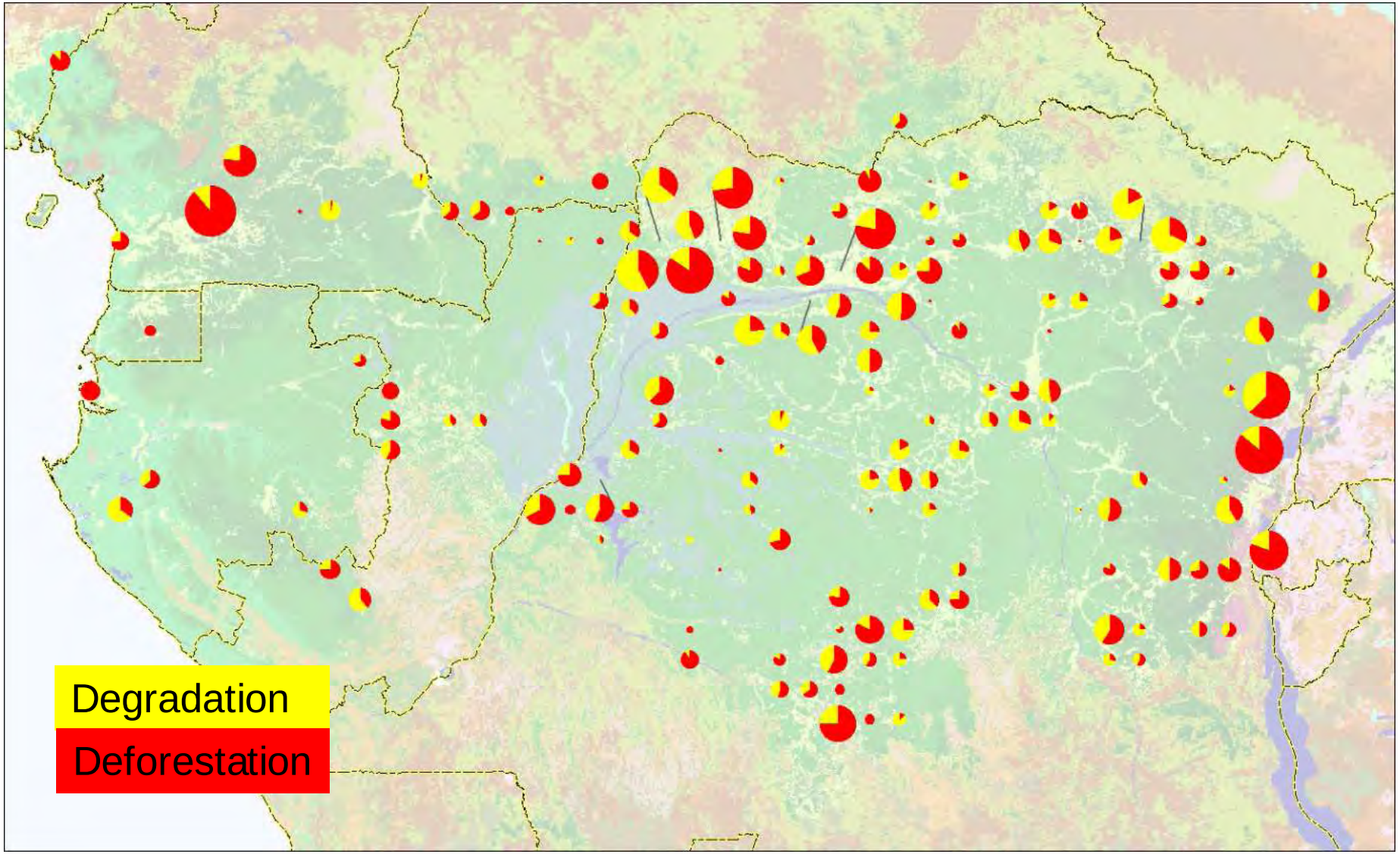
- 2500 - 5000

FOREST REGENERATION



Pilot results: forest cover change detection



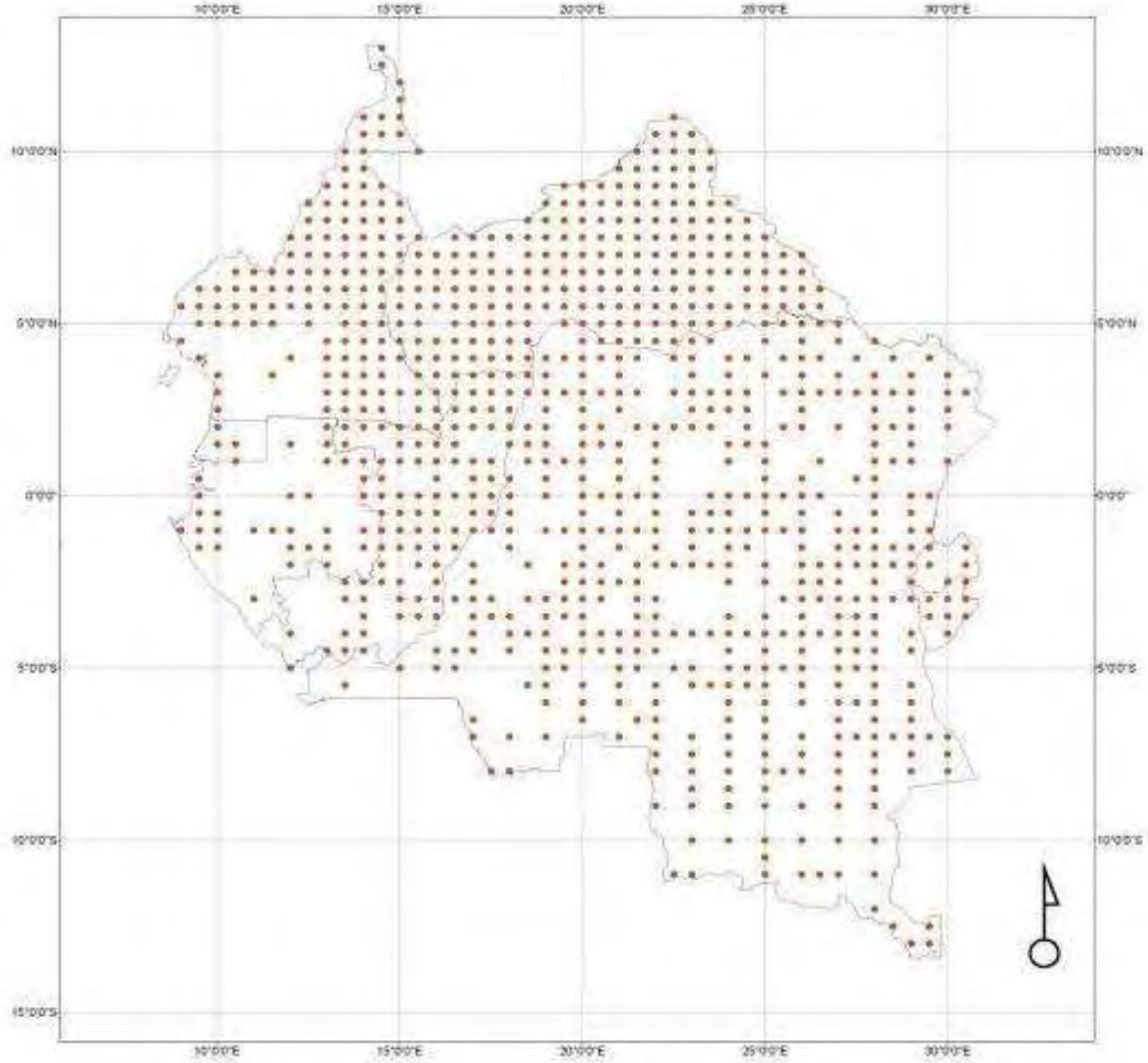
Pilot results: forest cover change detection for 1990- 2000

Country	Net annual deforestation (%)	Net annual degradation (%)
Cameroun	0,14	0,02
Gabon	0,09	0,07
Congo	0,02	0,01
CAR	0,06	0,02
DRC	0,20	0,12
Central Africa	**0,16**	**0,09**

State of the forest – 2008

(Duveiller et al., 2008)

Operational results: forest cover change estimate at national level with national experts



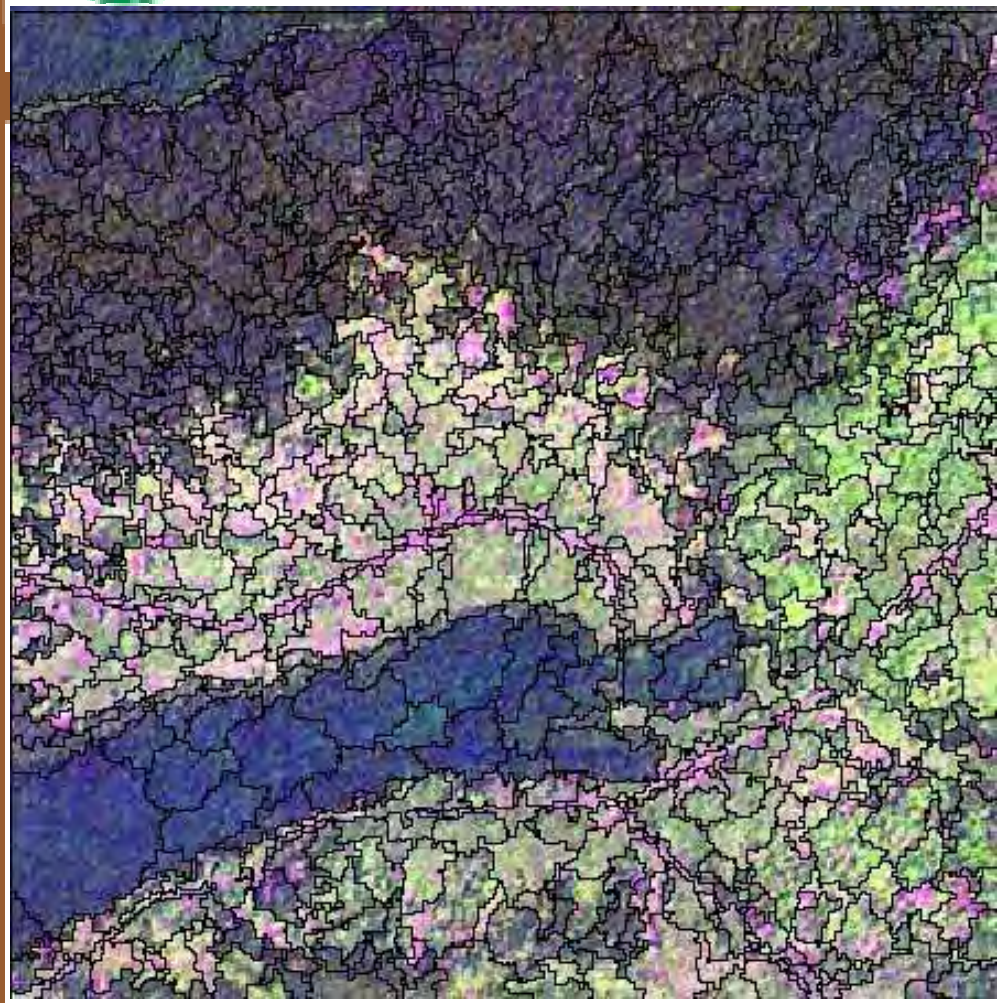
Area Frame Sampling:
- ½ degree for all
- ¼ degree for Eq. Guinea
- 1 degree for DRCongo

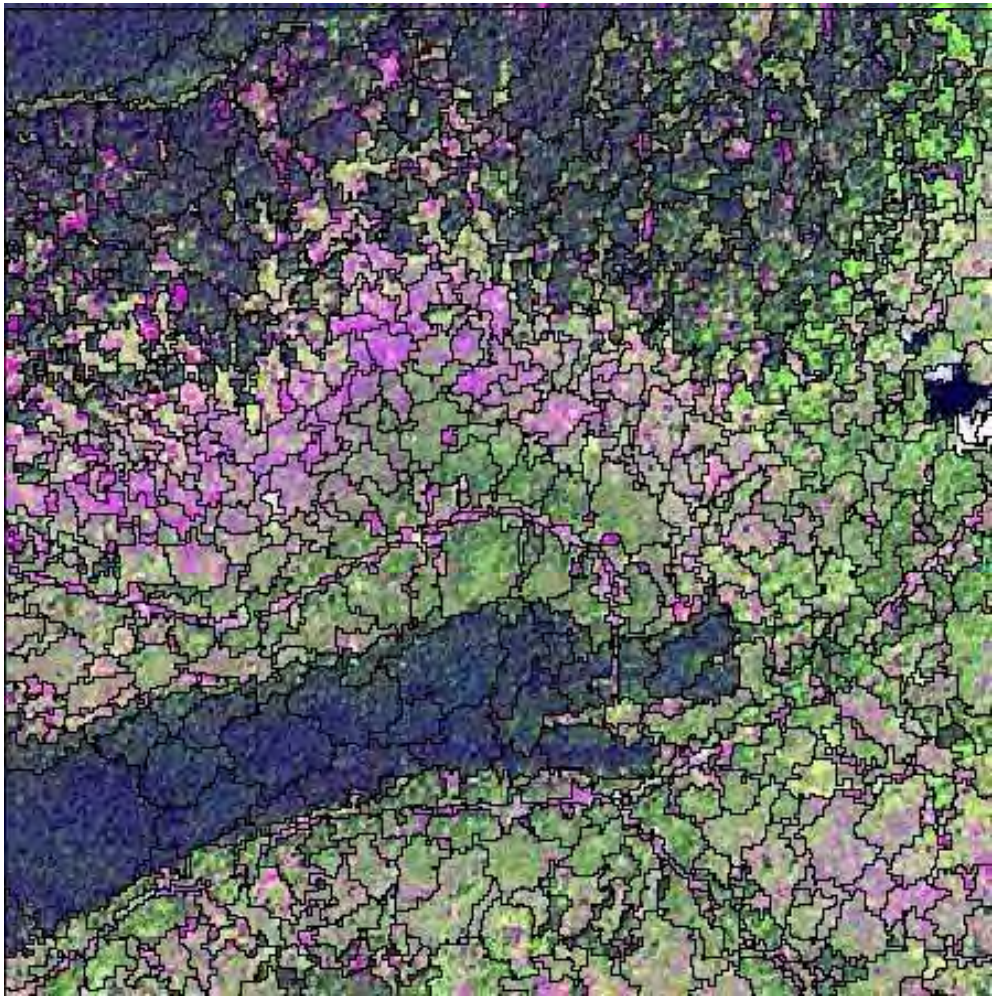
=> 1168 samples of Landsat extracts of 20 x 20 km

Most advanced automated approaches for
pre-processing (JRC algorithms)
pre-interpretation (UCL algorithms)

for final interactive intepretation by national experts

Operational results: forest cover change detection

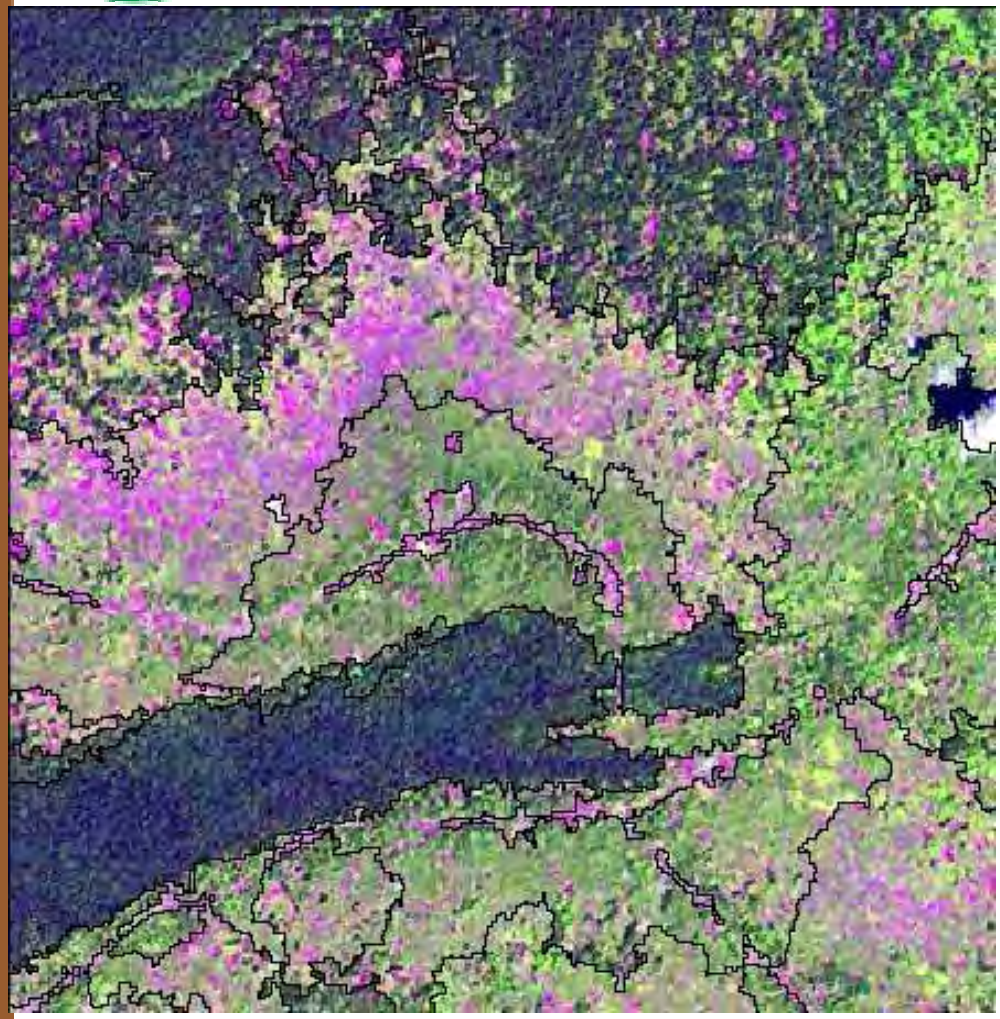


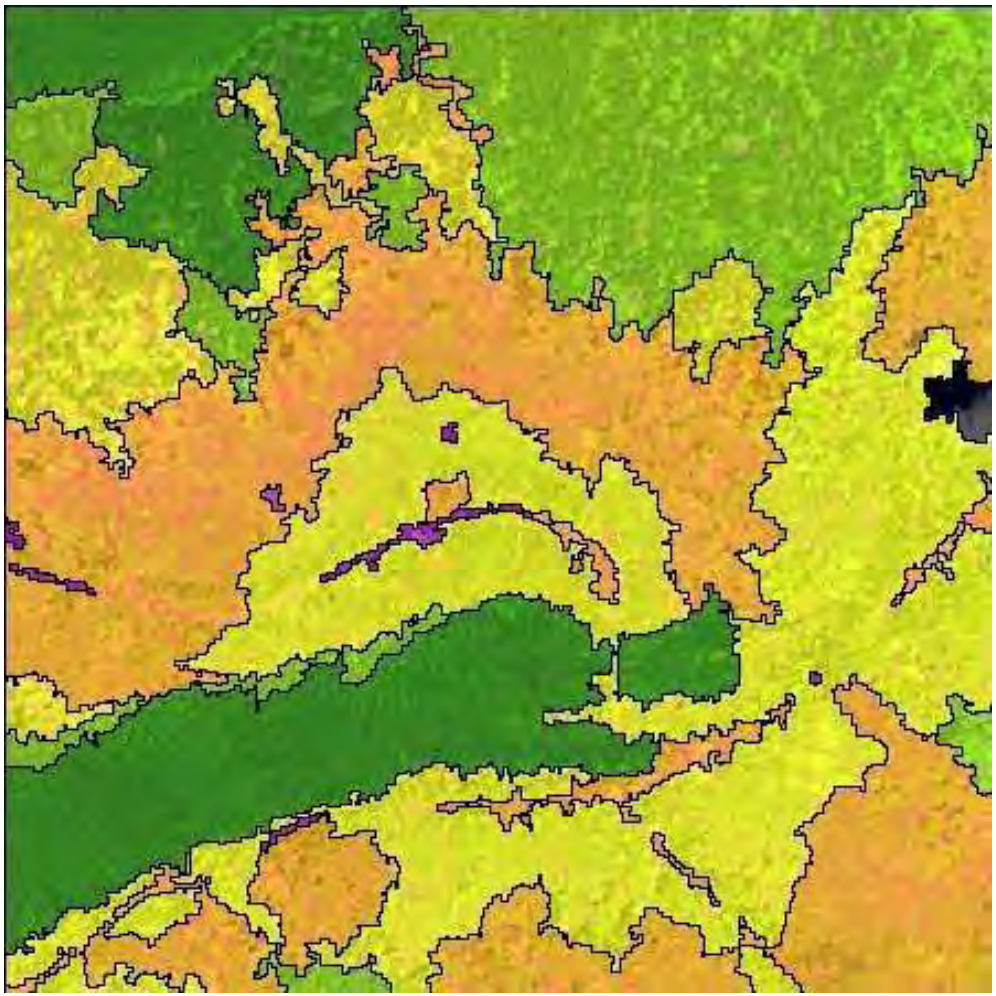


1990

2000

Operational results: forest cover change detection



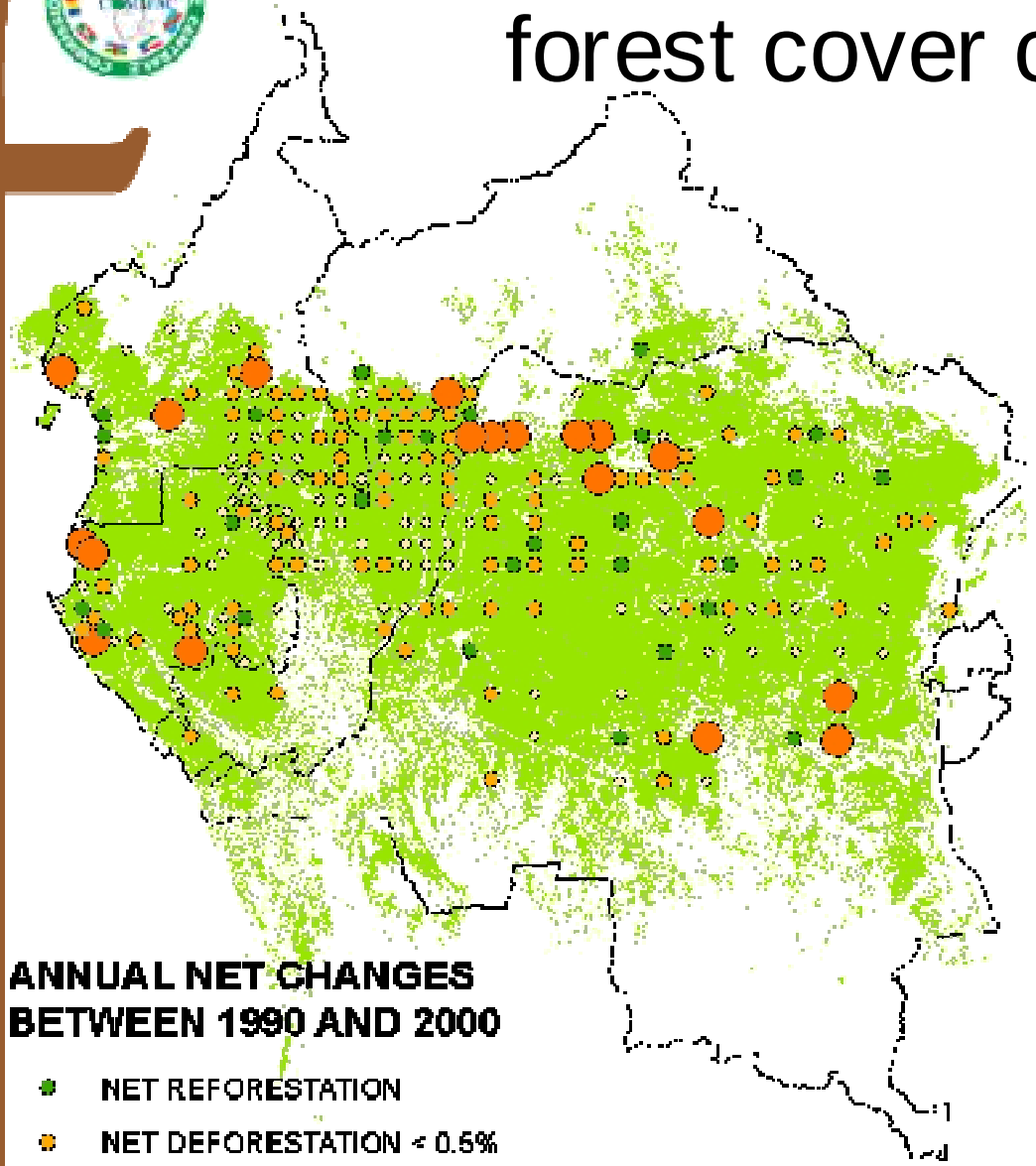


2000

Operational results: forest cover change estimate at national level with national experts

Regional Validation Workshop – Kinshasa, Sept. 2009

Very preliminary results: already processed extracts for forest cover change estimate



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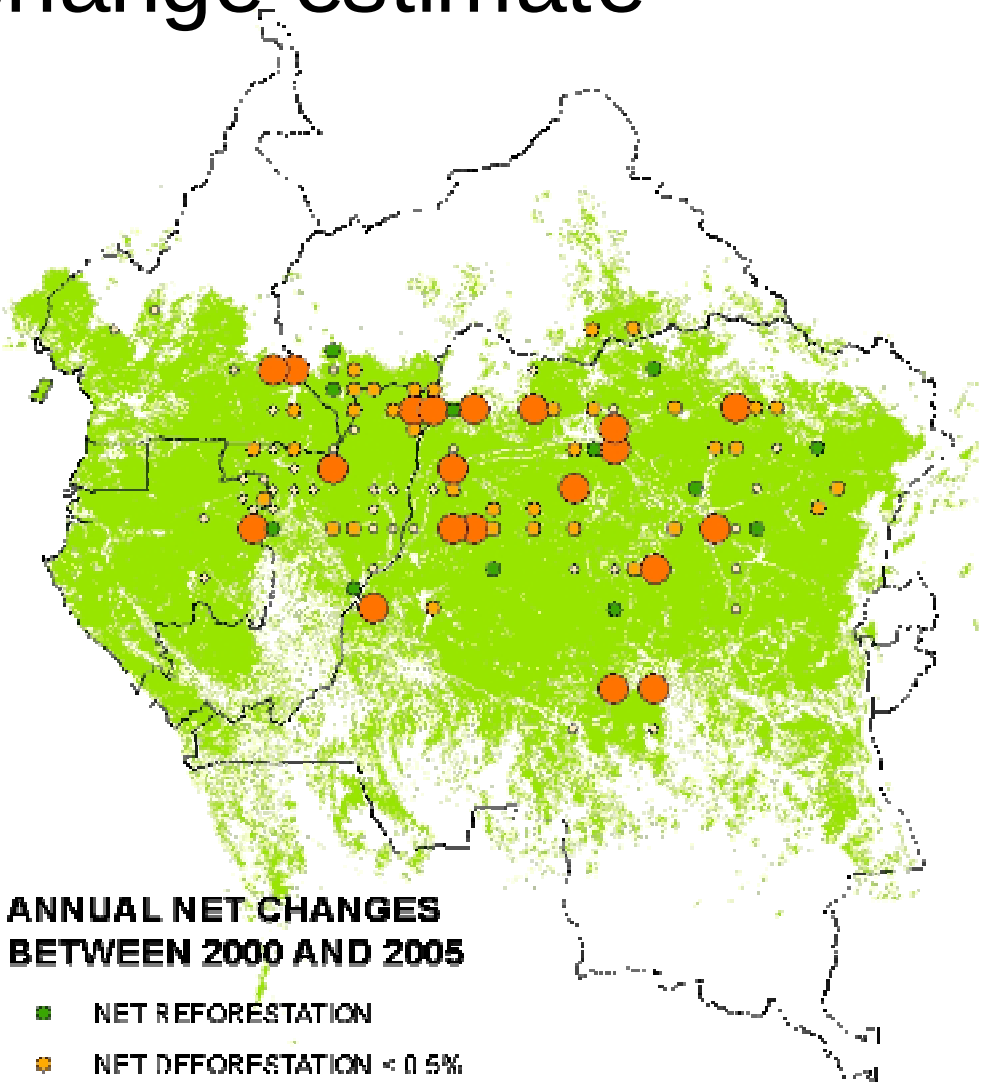

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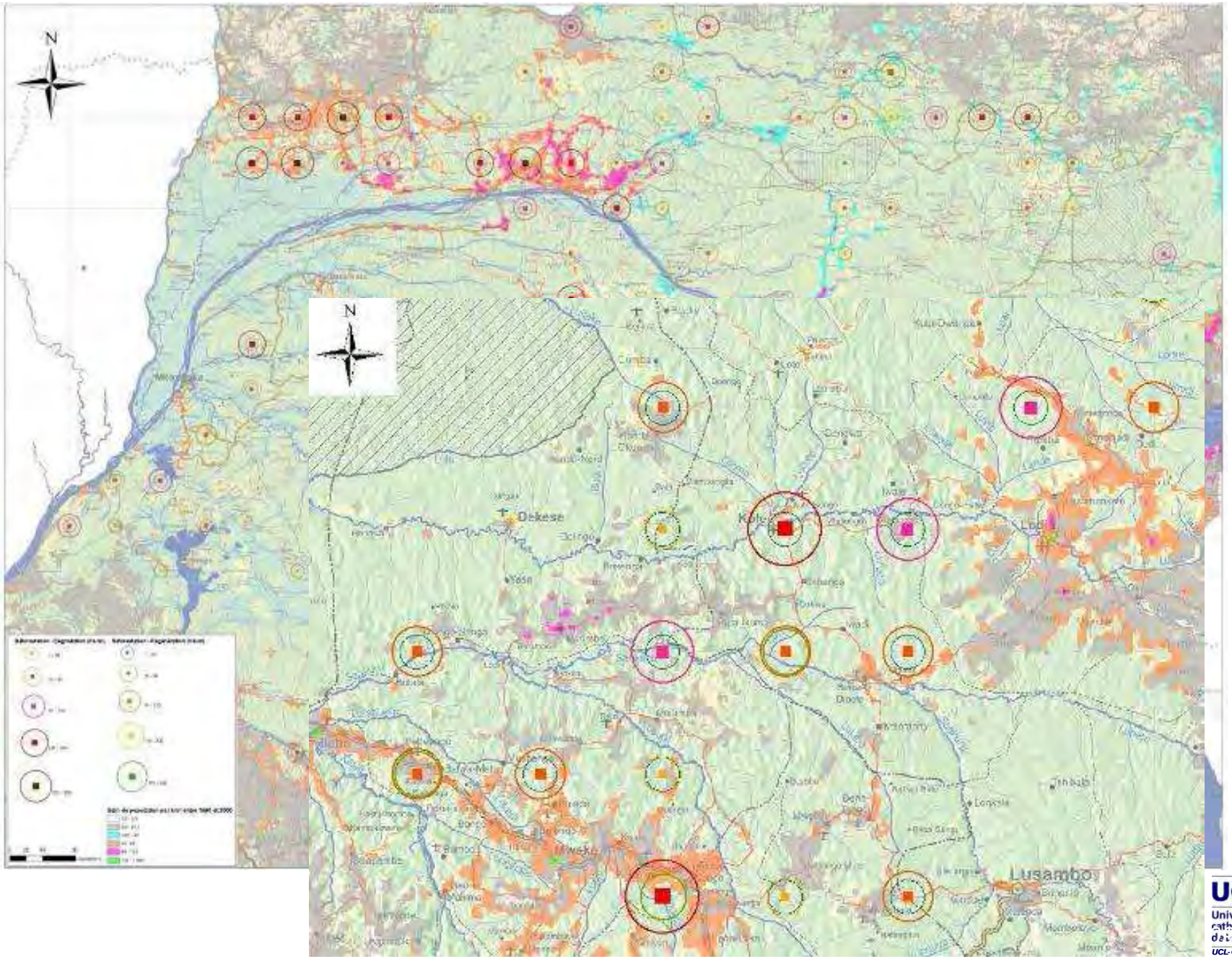
Deforestation drivers analysis

On-going study in the framework of the UN-REDD DRC coordination



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Perspectives

- **Technological and scientific maturity** for forest change assessment

  => International effort to enhance the satellite data acquisition strategy (regional receiving station, SAR coverage)

- Capacity building and technology transfer needed to support **national ownership**

  => National reporting is required

- **Observatory of Central African Forests** : a very efficient collaborative framework capitalizing various efforts

  ⇒ robust estimate at national level by early 2010

  ⇒ follow-up for 2005-2010 already planned