



Aplicaciones terrestres

- Sobrevista de proyectos y productos del Centro alemán de datos de percepción remota en el Centro alemán aeroespacial (DFD – DLR)
- Michael Schmidt, Abril 23 de 2008



Deutsches Zentrum
für Luft- und Raumfahrt e.V.
in der Helmholtz-Gemeinschaft

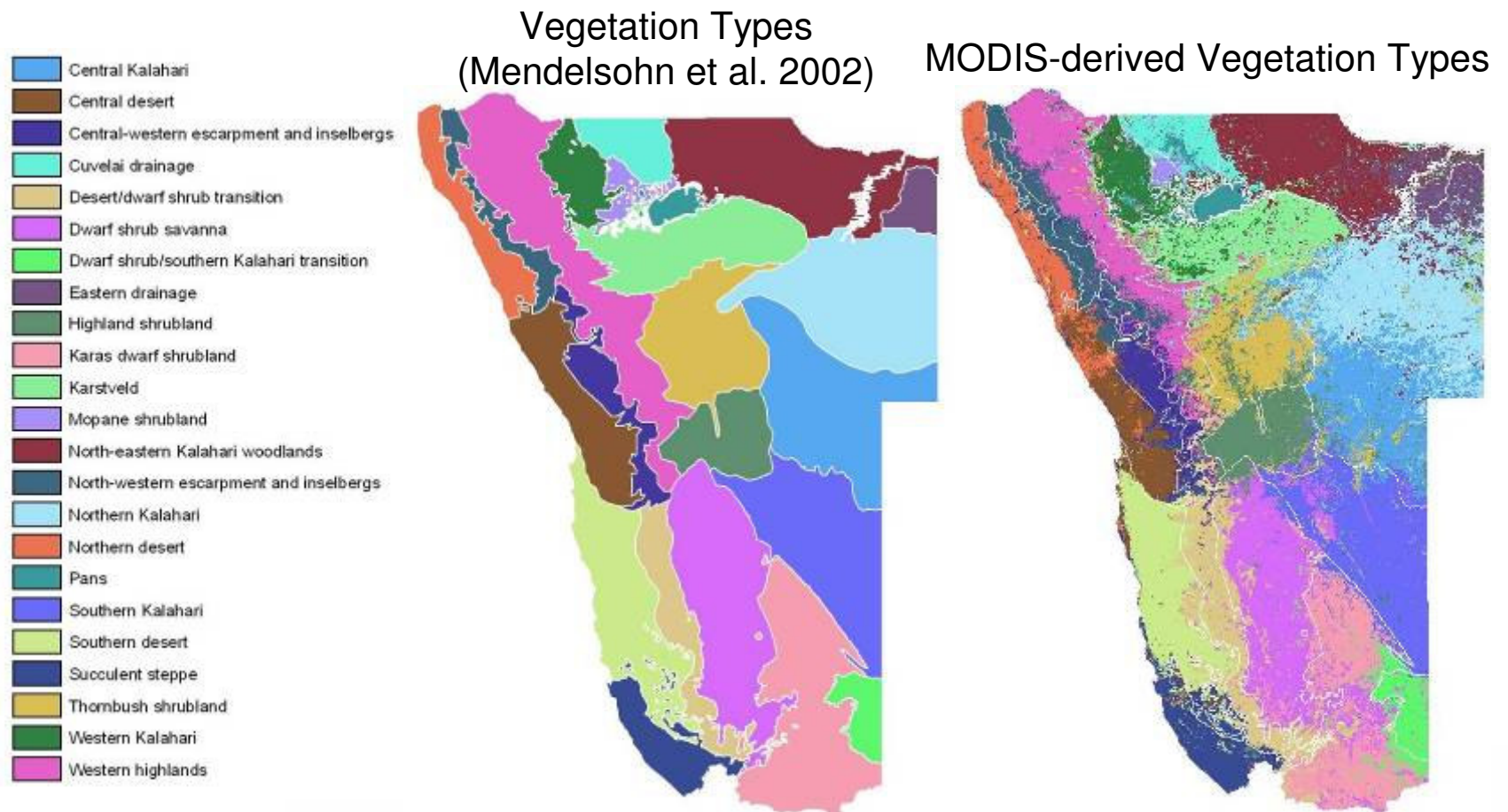


Temas

- Biodiversidad
 - Análsis de paisaje
- El ambiente urbano
- Agua y manejo de recursos acuáticos
- Agricultura
 - Mapeo de uso de suelo
 - Modelación de riego
- El ambiente forestal

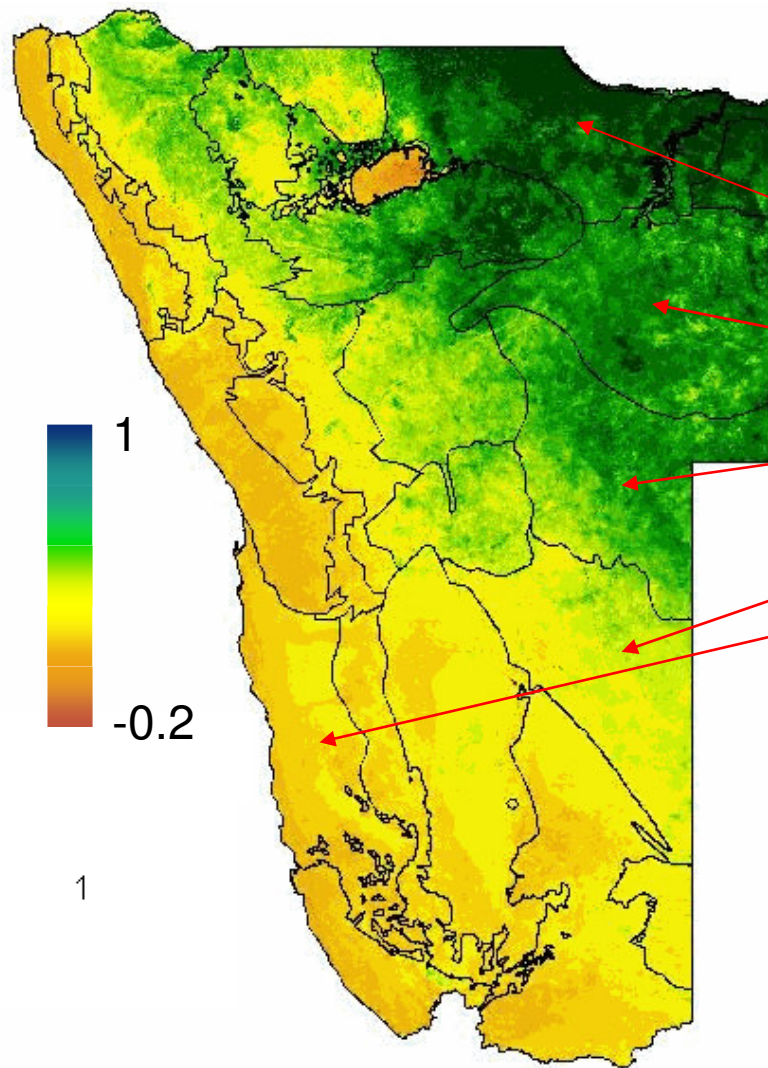
Vegetation Types of Namibia

Mapping of large areas with remote sensing time series

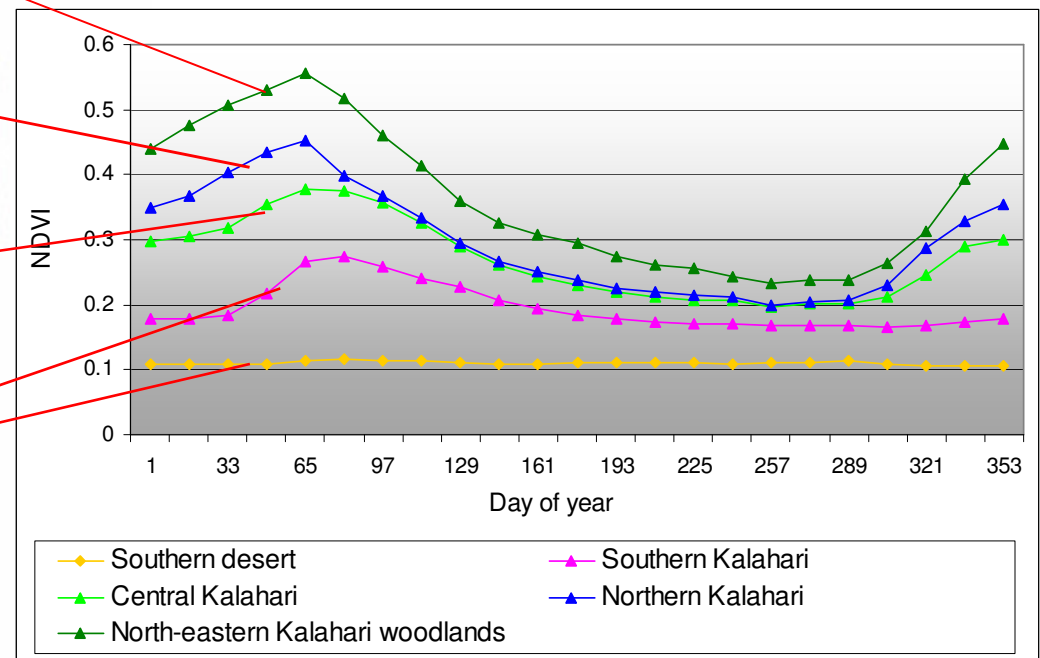




Data basis - multi-temporal satellite data

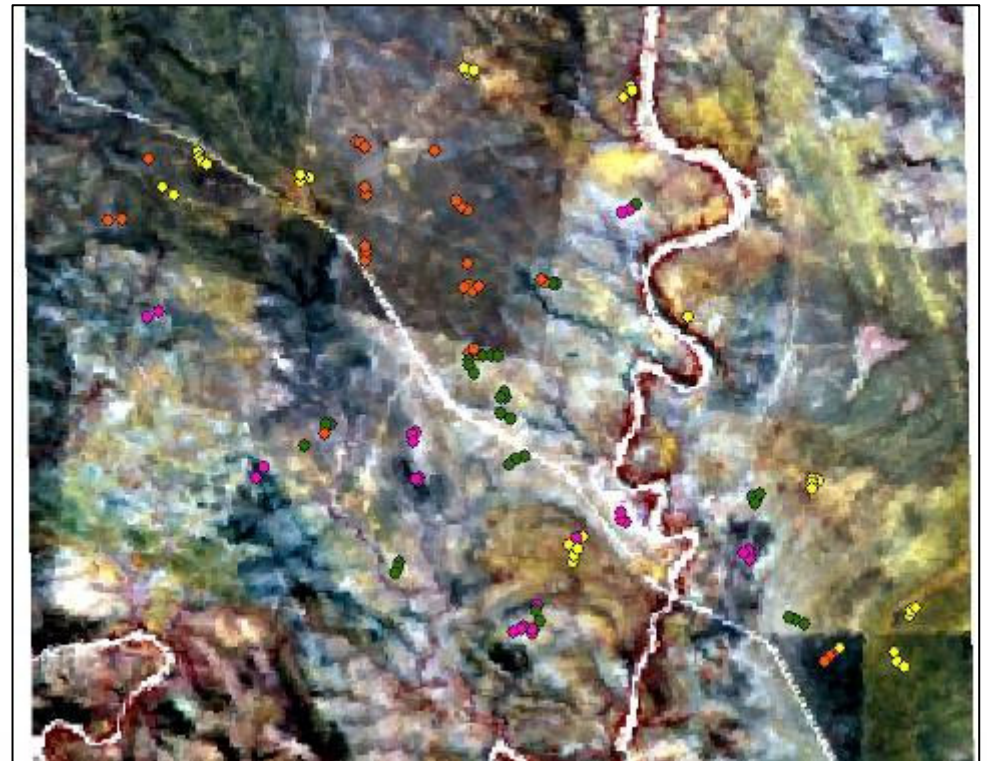
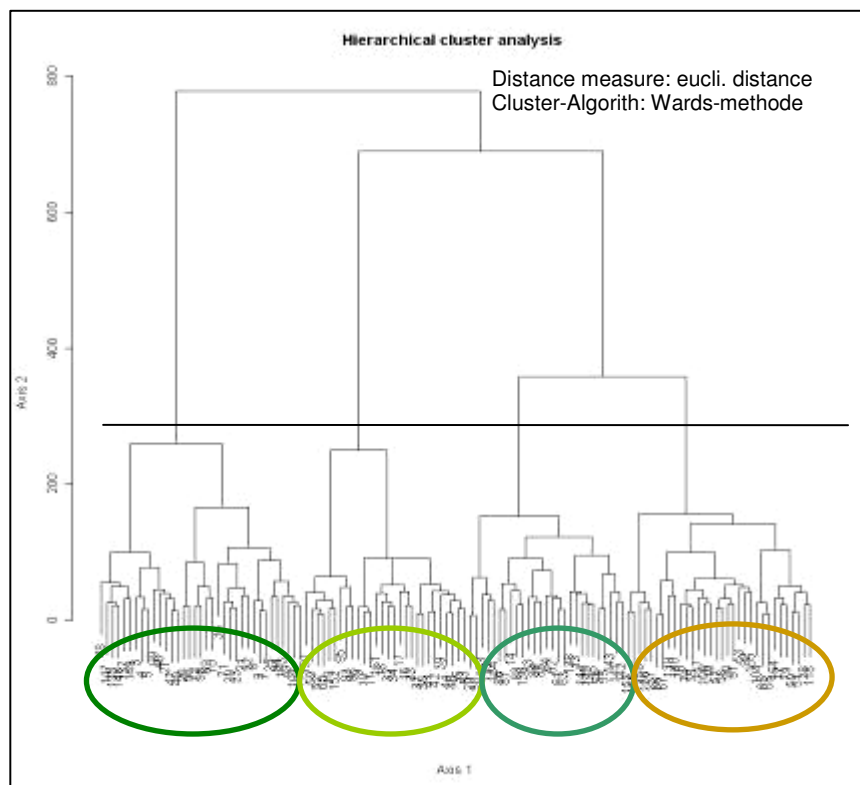


MODIS NDVI of the year 2002

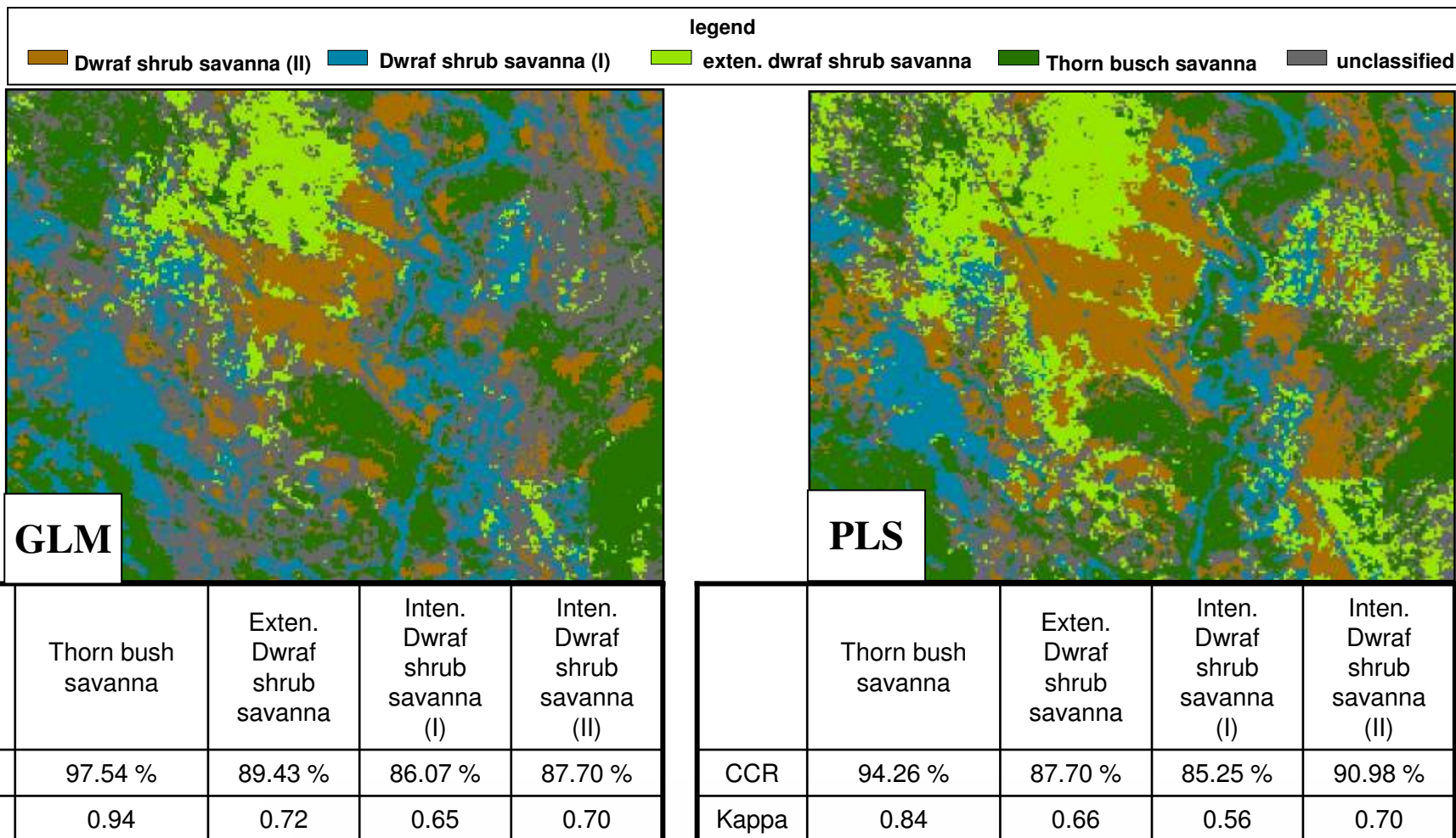




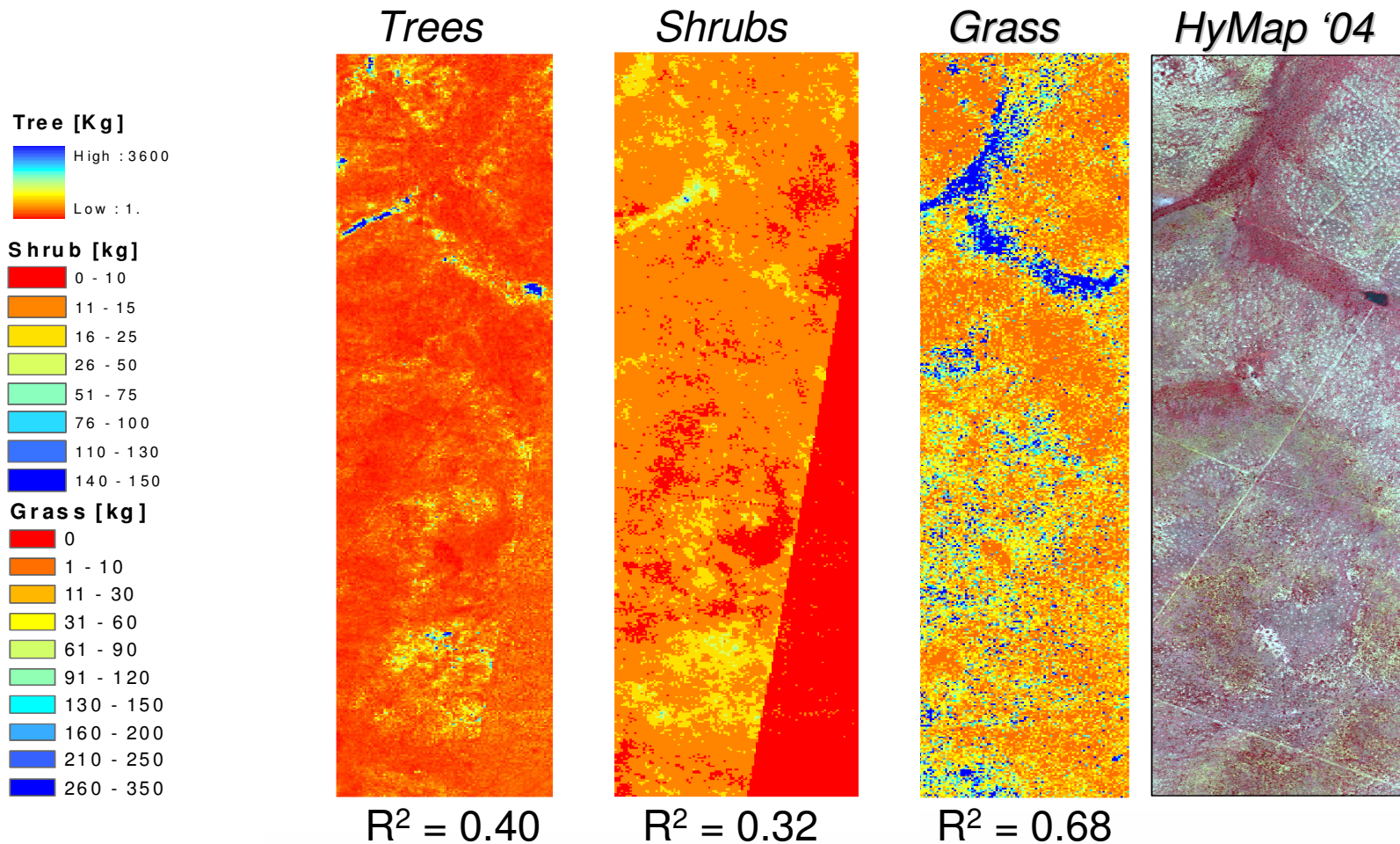
Modelling vegetation classes with GLM and PLS with Vegetation Indices for CHRIS/Proba



Modelling vegetation classes with GLM and PLS with Vegetation Indices for Chris/Proba



Biomass Modelling using Groundtruth data and Hyperspectral Imagery



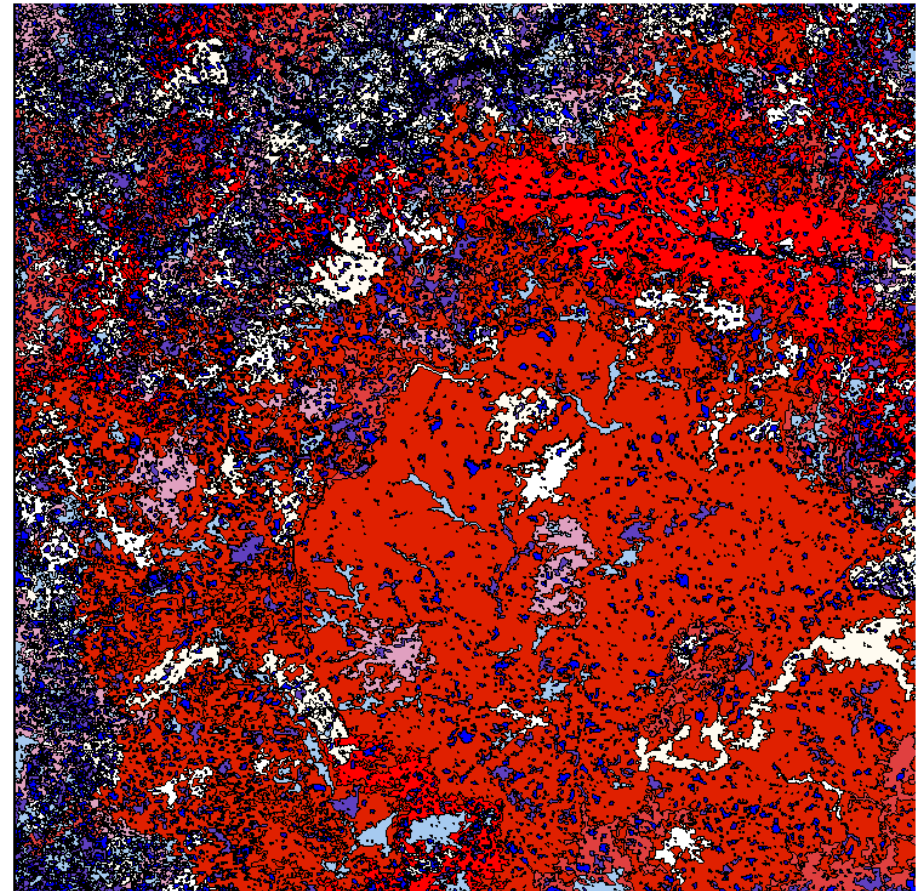
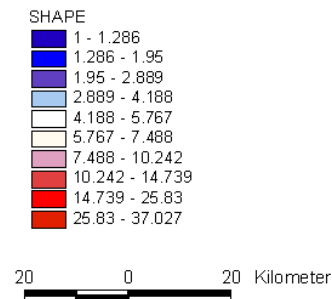


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Shape – Analysis of area shape

- Improved parameter – area index
- Low values indicate geometric similarity to a rectangular of equal size
- Data base: MOD09Q1 2004, 20 Klassen



Patch analysis results – based on types of patches

➤ Individual patch attributes

➤ - Area, Perimeter, compactness, SHAPE

➤ Patch context

Isolation

Neighbourhood relationship

Area/SHAPE

SHAPE Index

high
low

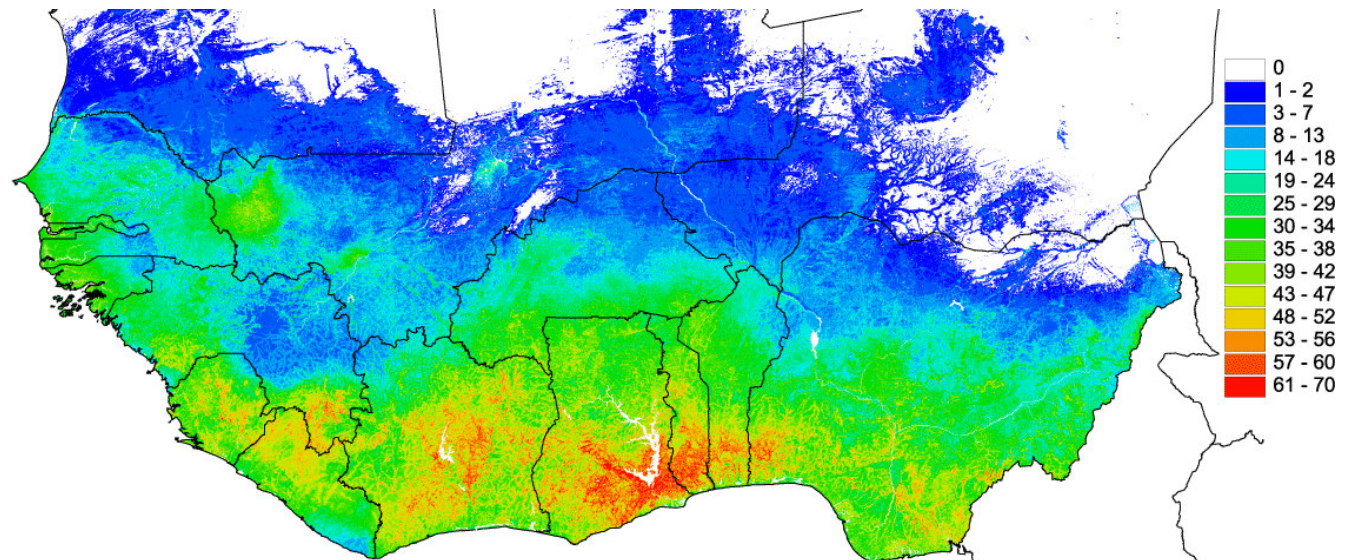
Voronoi Distance

low
high

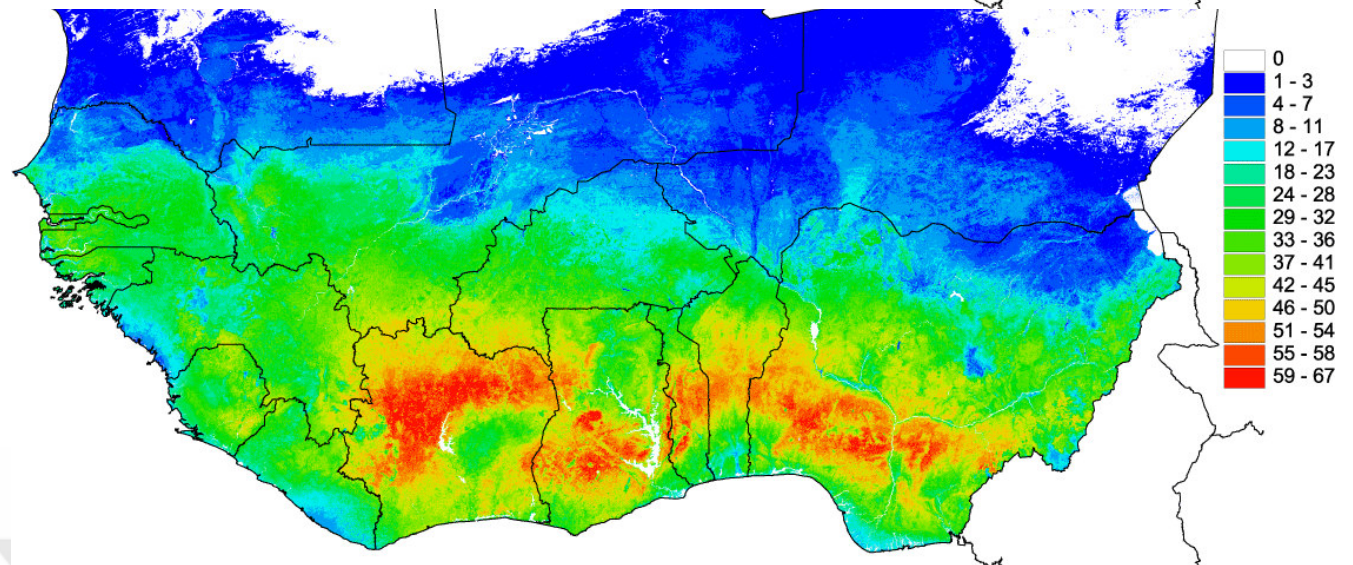


Diversity of Chiroptera (Bats), West Africa

Maxent



GARP

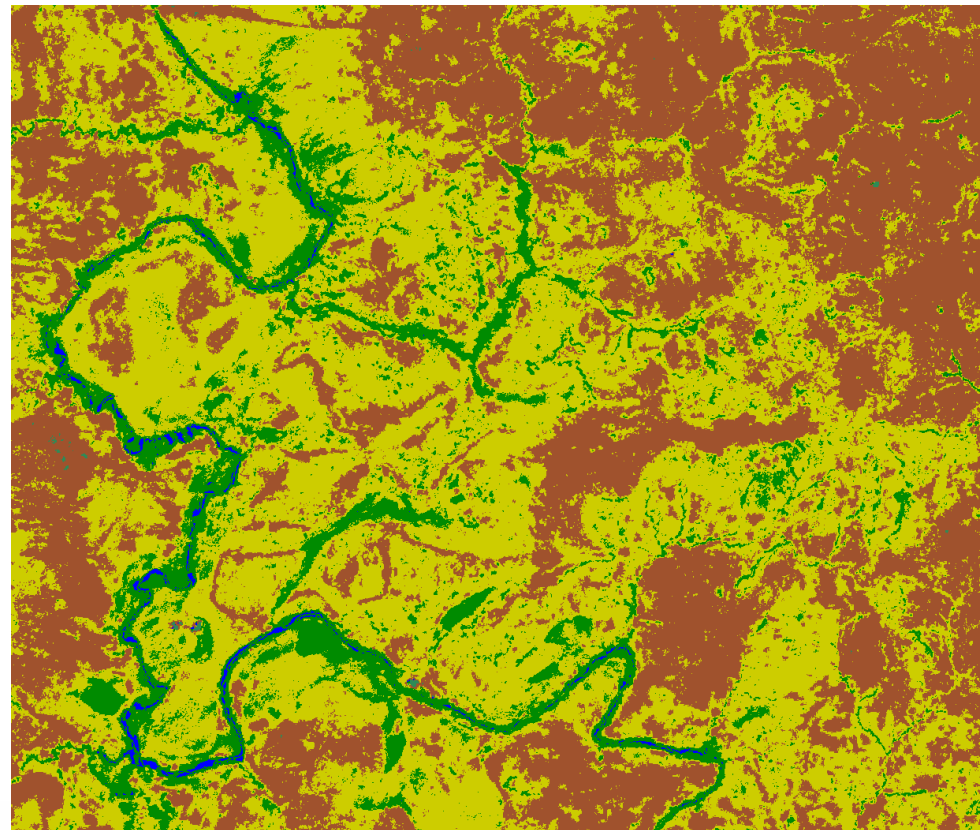
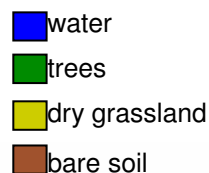


Deutsches Zentrum
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Deutsches Fernerkundungsdatenzentrum

Local scale vegetation structure as classes

- Objective: spectral mixture modeling to retrieve tree cover density and fractional cover of life form per pixel (woody, herbaceous, bare soil)
- comparison with ordinal land cover classes, traditional classification approach

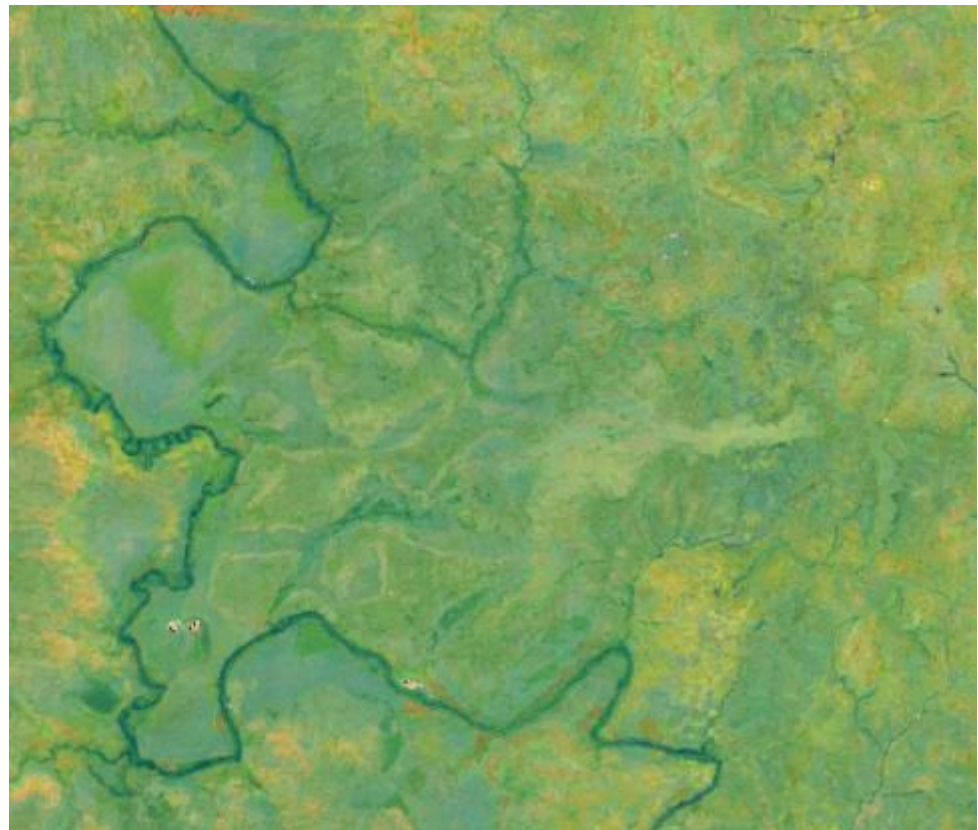
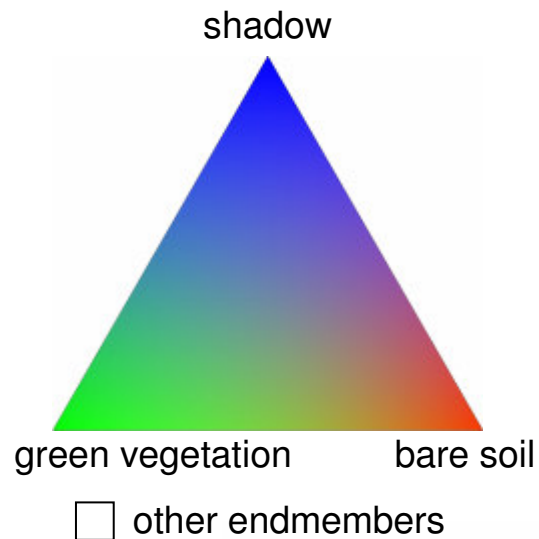


from PhD thesis: M. Schramm



Local scale vegetation structure as continuum

- Spectral unmixing result shows a continuous *improved* vegetation gradient



from PhD thesis: M. Schramm



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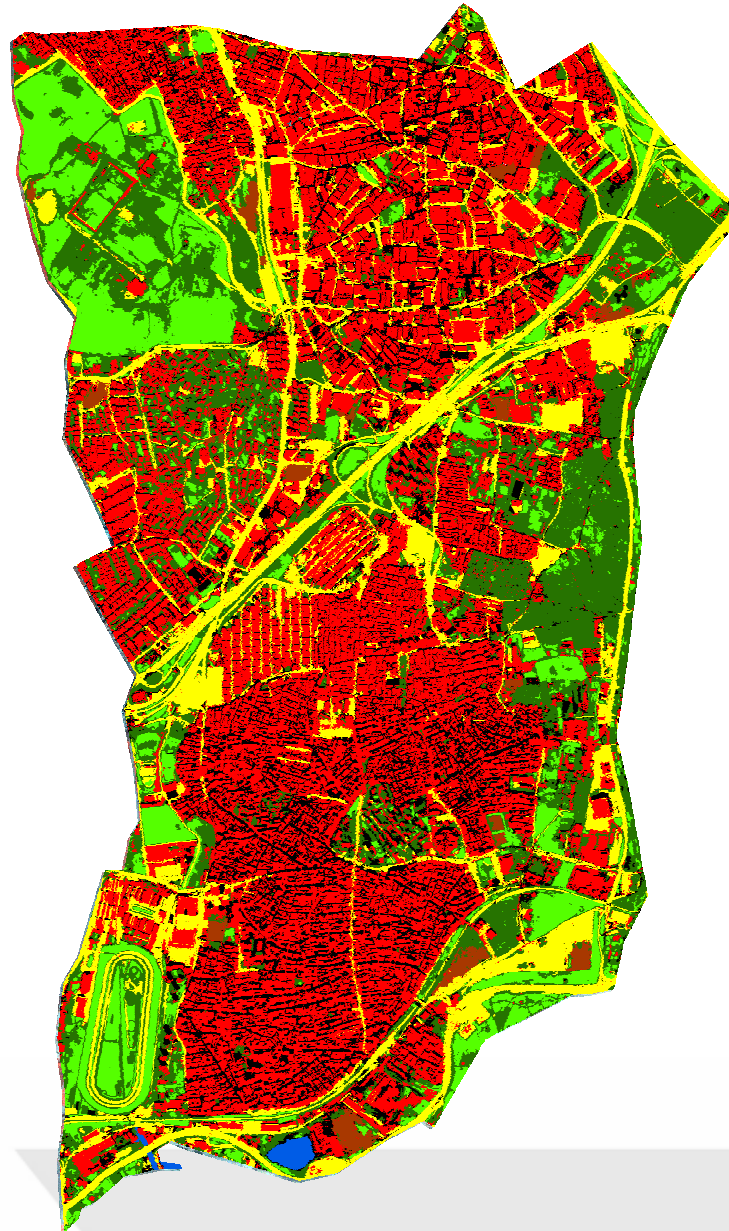
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Clasificación de zonas urbanas (opción 1)

Resolución alta de
datos ópticos de
satélites
(mostrado: IKONOS
1m)

Ejemplo:
Districto Zeytinburnu,
Istanbul



- Houses
- Streets
- Trees
- Grassland
- Bare Soil
- Water
- Shadows

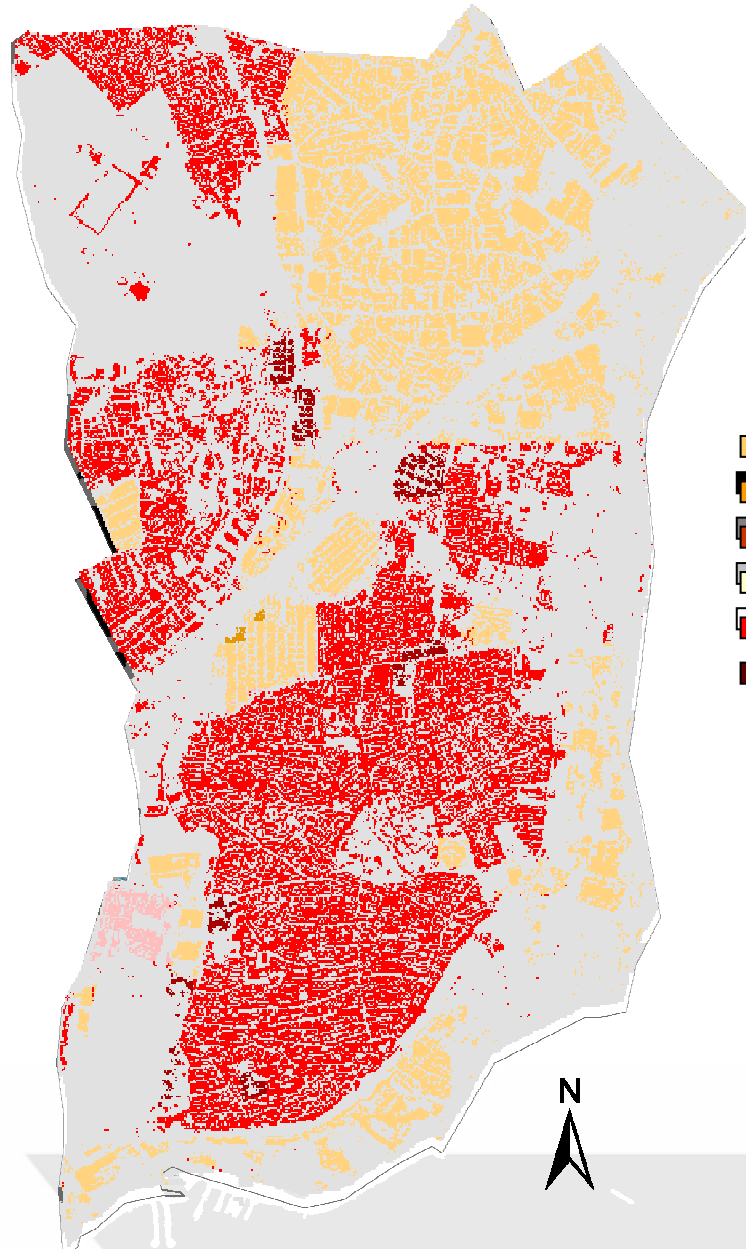
Estructura Urbana

•PARAMETROS

Densidad de zonas de
construcción

altura de edificios

Uso de suelo



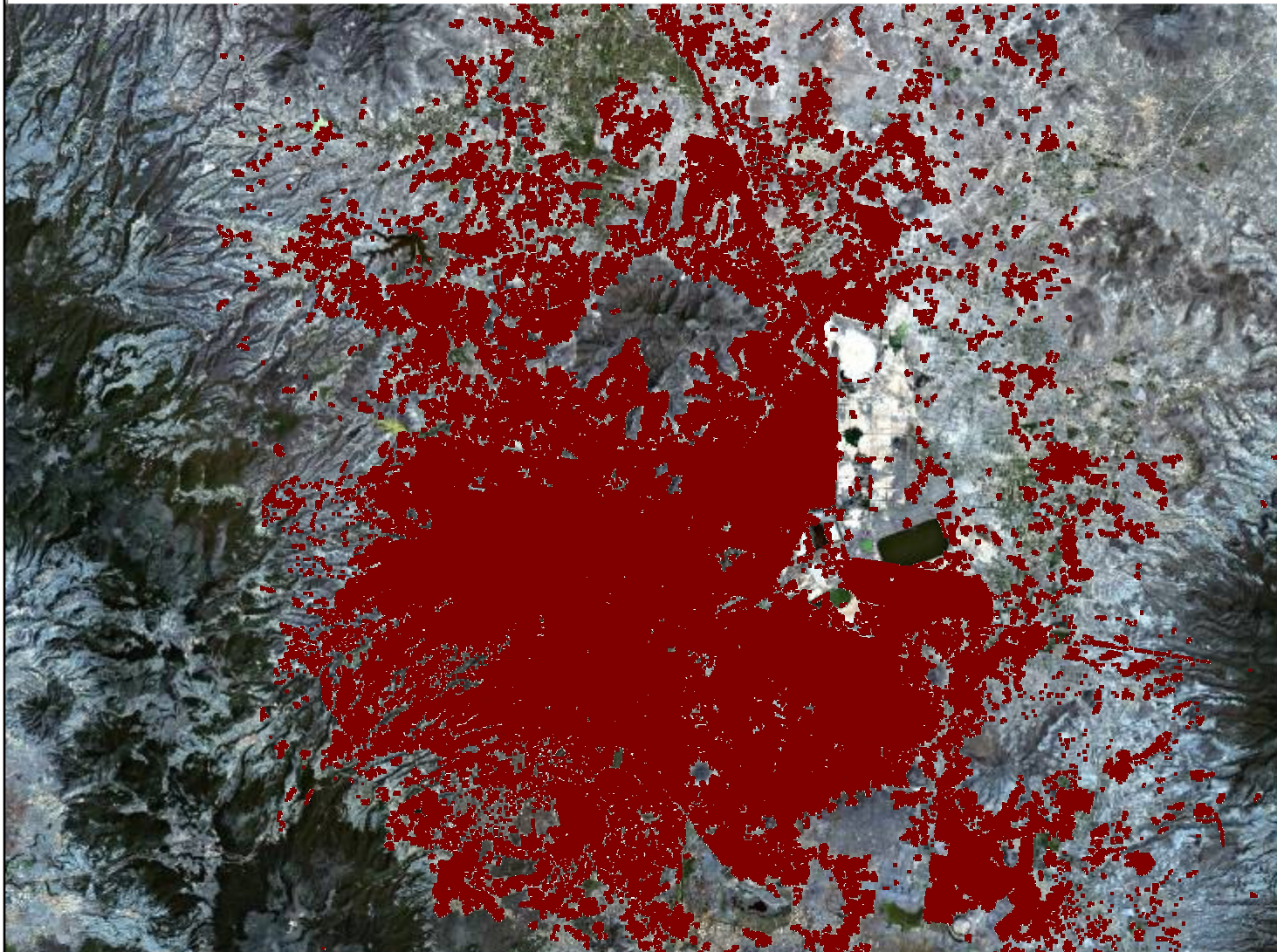
- Commercial use; 1-3 floors
- High density zone; Commercial use; 4-7 floors
- Medium density zone; Commercial use; >7 floors
- Low density zone; Residential use; 1-3 floors
- Open spaces; Residential use; 4-7 floors
- Residential use; >7 floors



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México DF – áreas pavimentadas 2001



Leyenda: suavizada y generalizada



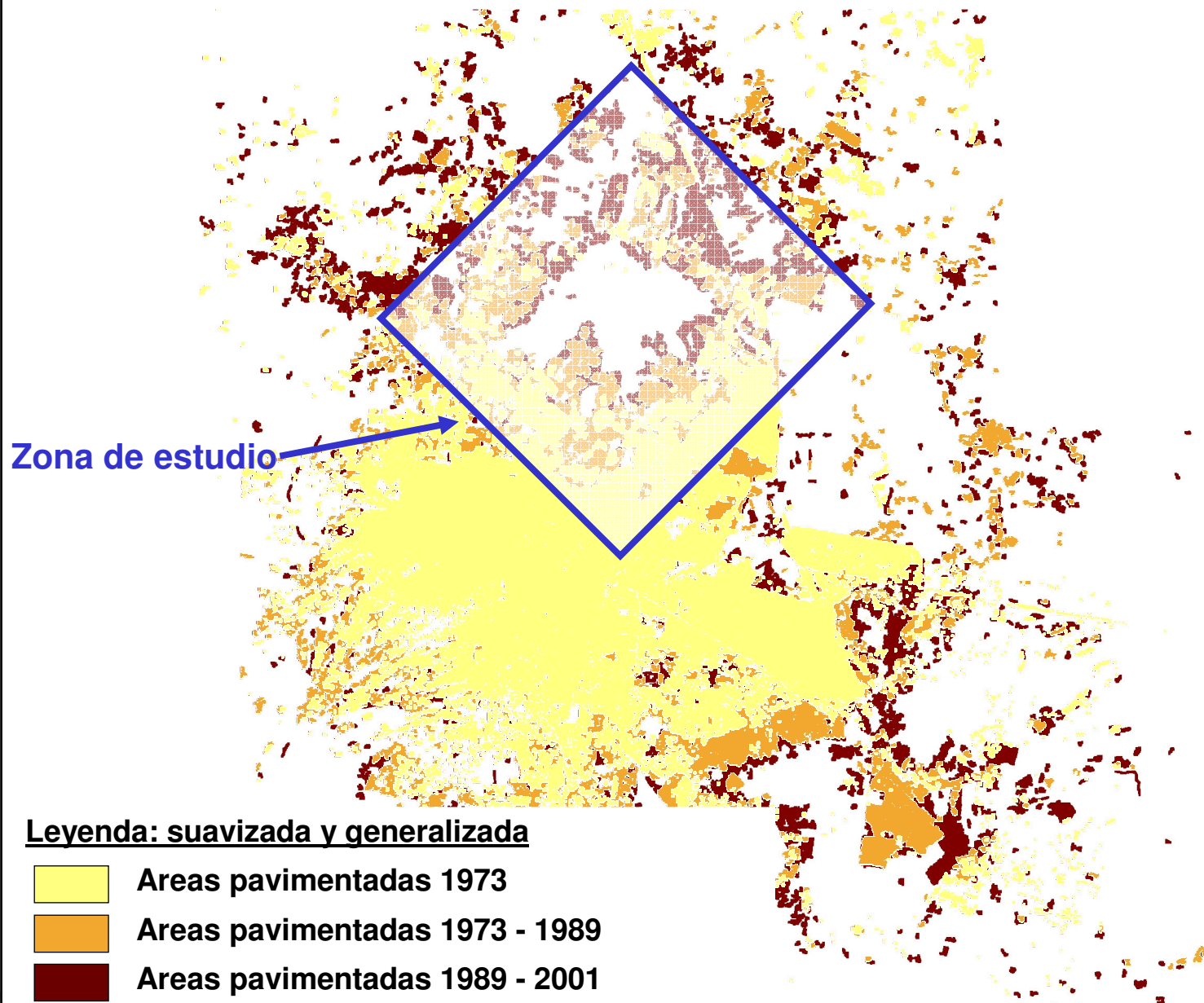
Áreas pavimentadas 2001



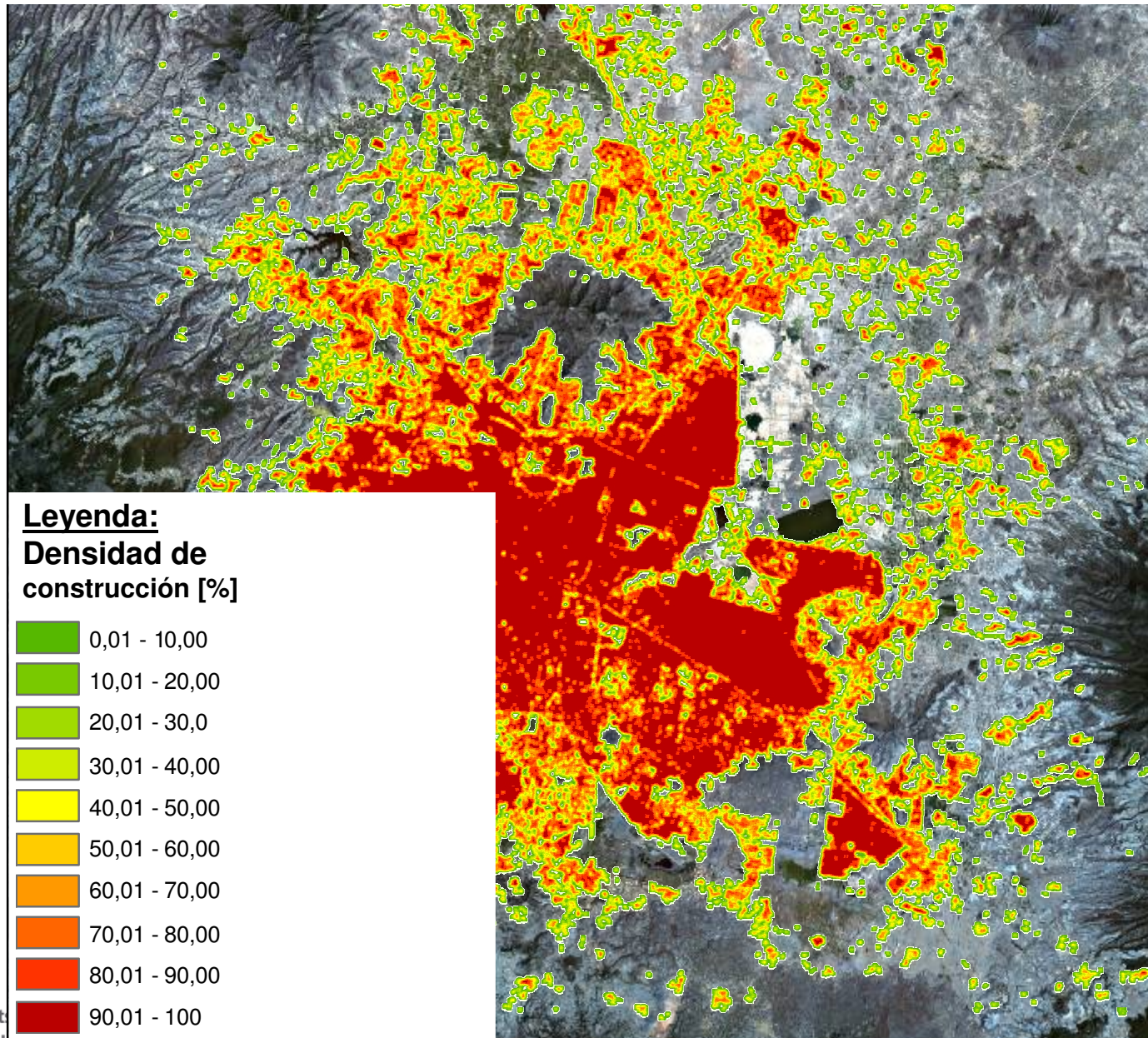
Deutsches
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Detección de cambio - México DF 1973 -2001



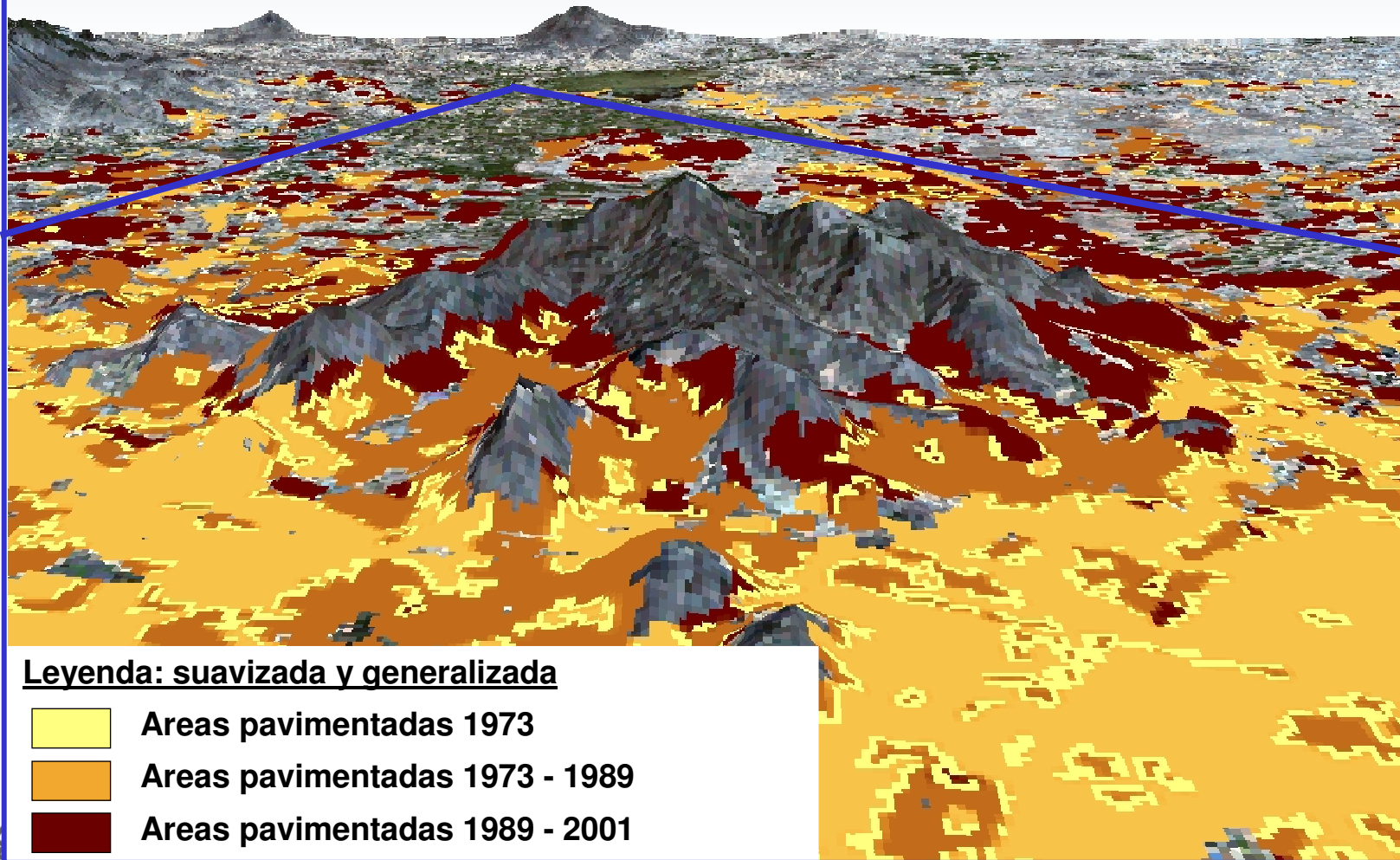
México DF 2001 – Densidad de construcción



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Estudio de caso – México DF 1973 -2001

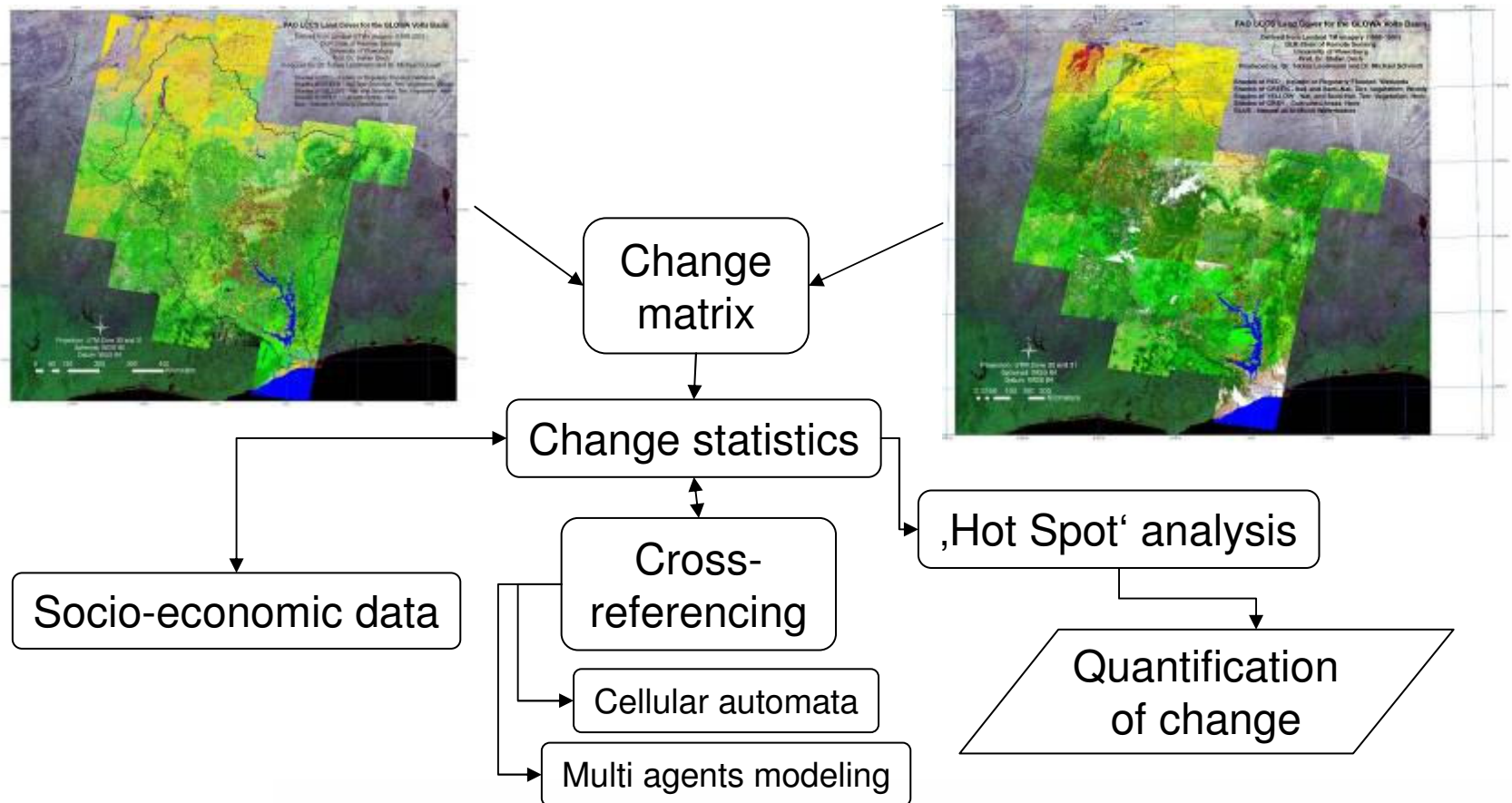




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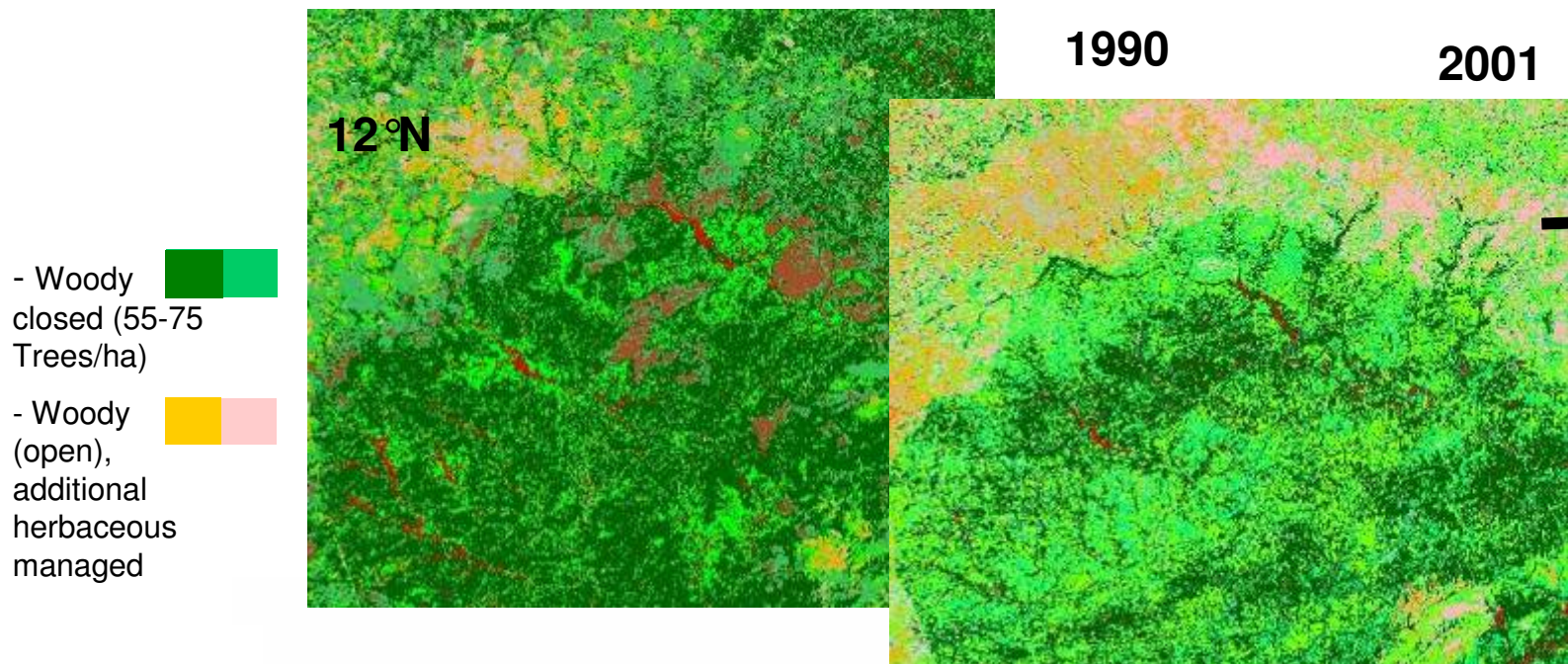
LCCS based change detection mechanism, 1990 – 2000/2001 data sets





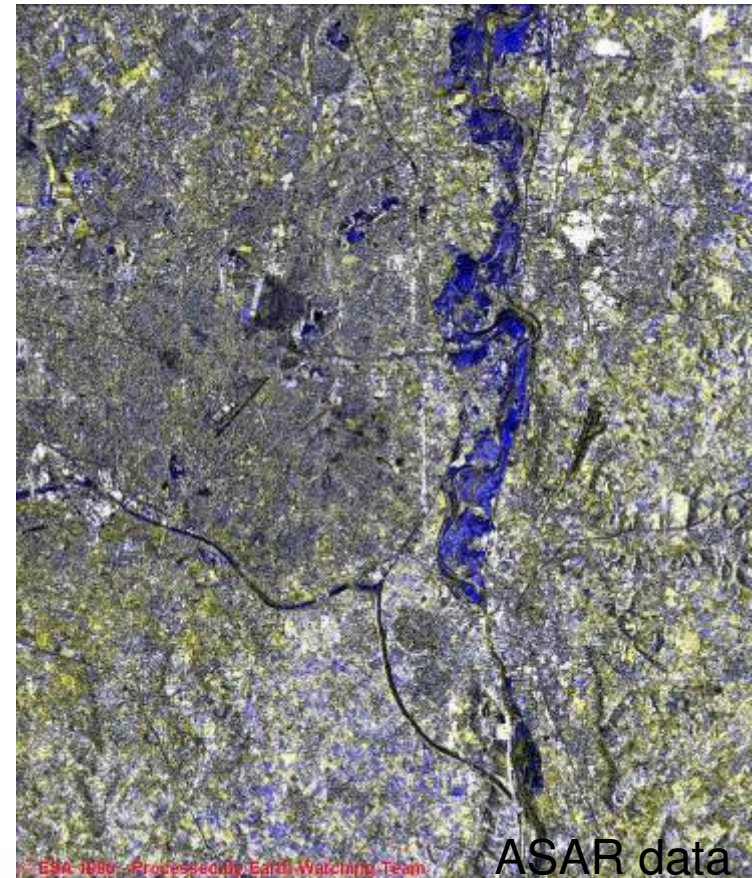
Zooming in: LC change example 1990-2001

- thinning of tree cover related to the expansion of agricultural areas
- Pendjari National Park in Benin, West Africa





Water Levels in Near Real Time from Microwave and Optical Satellite Data

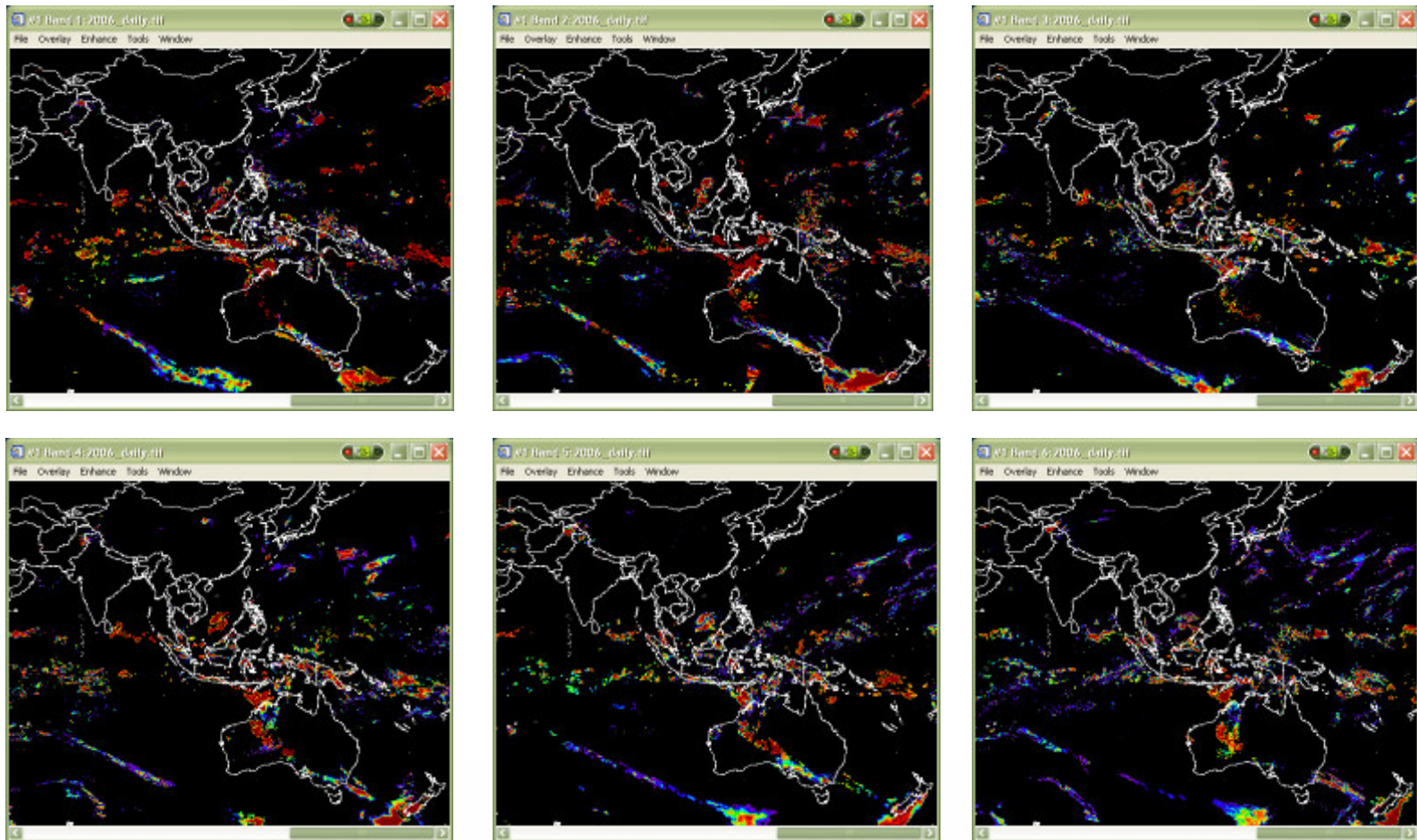


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Monitoring Precipitation over the Whole Drainage System, using TRMM data to feed models for Flood Prediction

Daily data (1st week of January 2006)



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Deutsches Fernerkundungsdatenzentrum

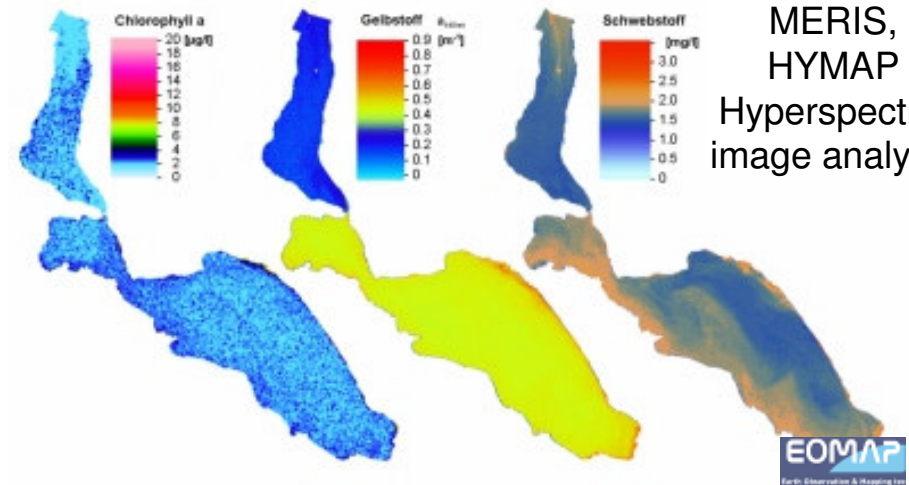
Environment: Water and Chemical Pollution

➤ Location

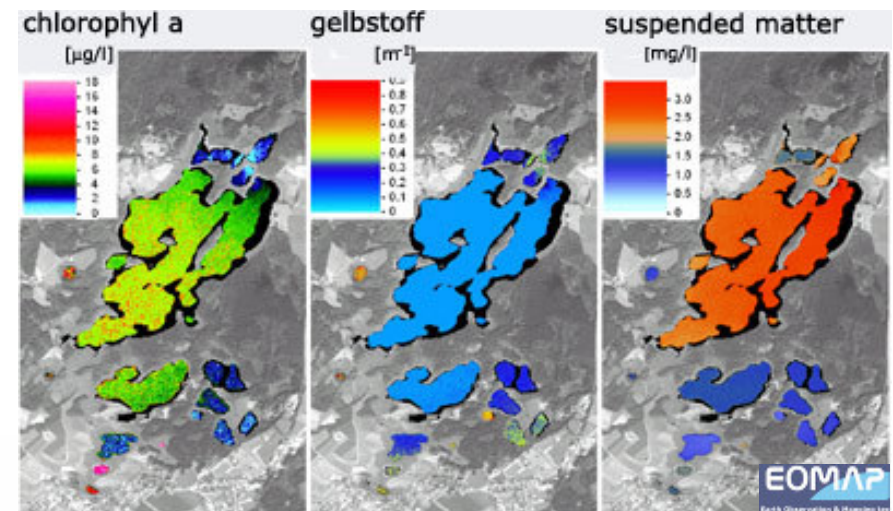
- Germany, Bavaria
Sub-Alpine Lake Region

➤ Political Relevance

- **Health threat**
for man and environment
- **Manmade threat to fragile ecosystems**
- **Long-term monitoring of ecosystems**



Envisat-
MERIS,
HYMAP
Hyperspectral
image analysis



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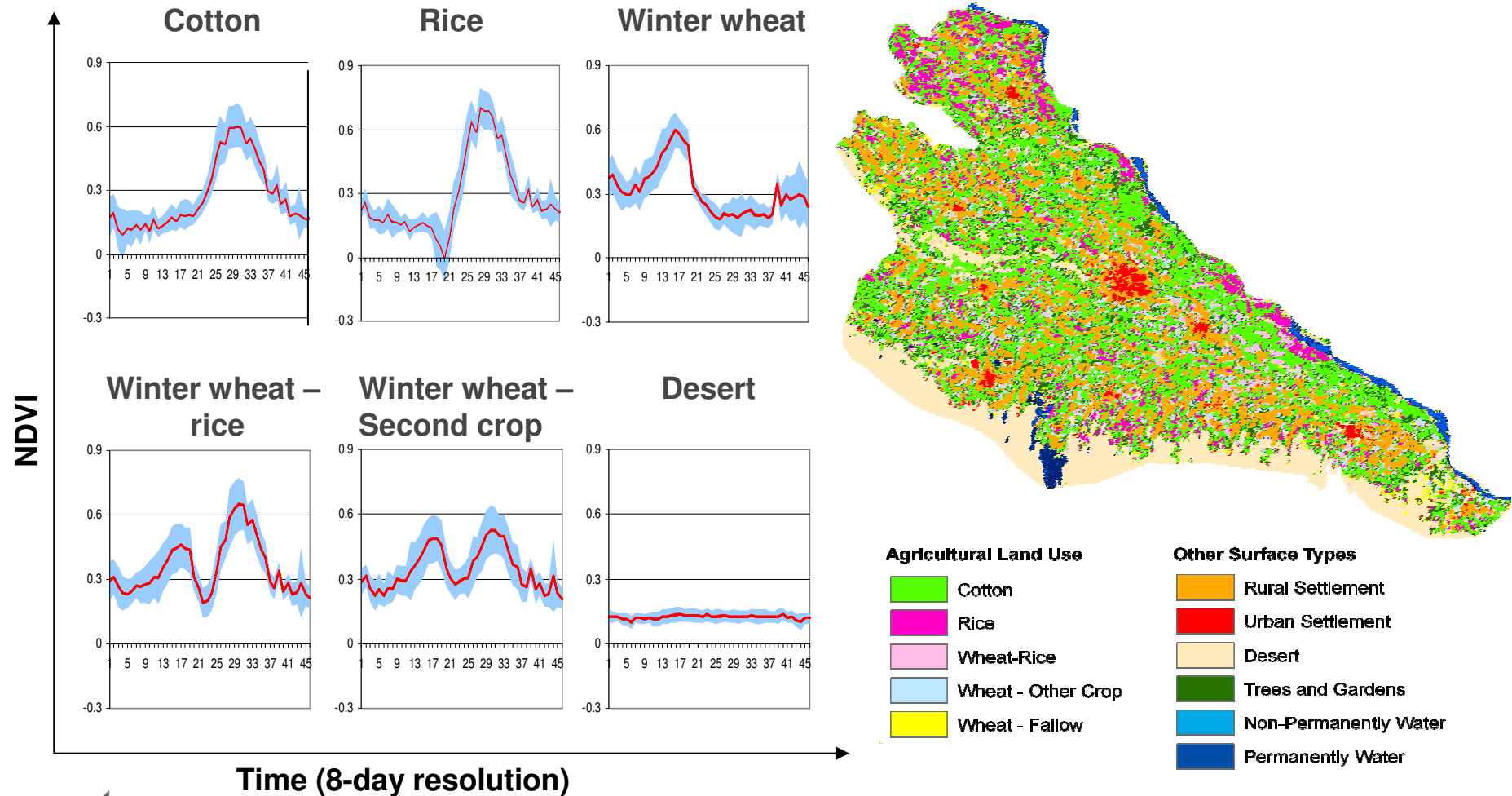
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Land Use / Land Cover Classification at Regional Scale

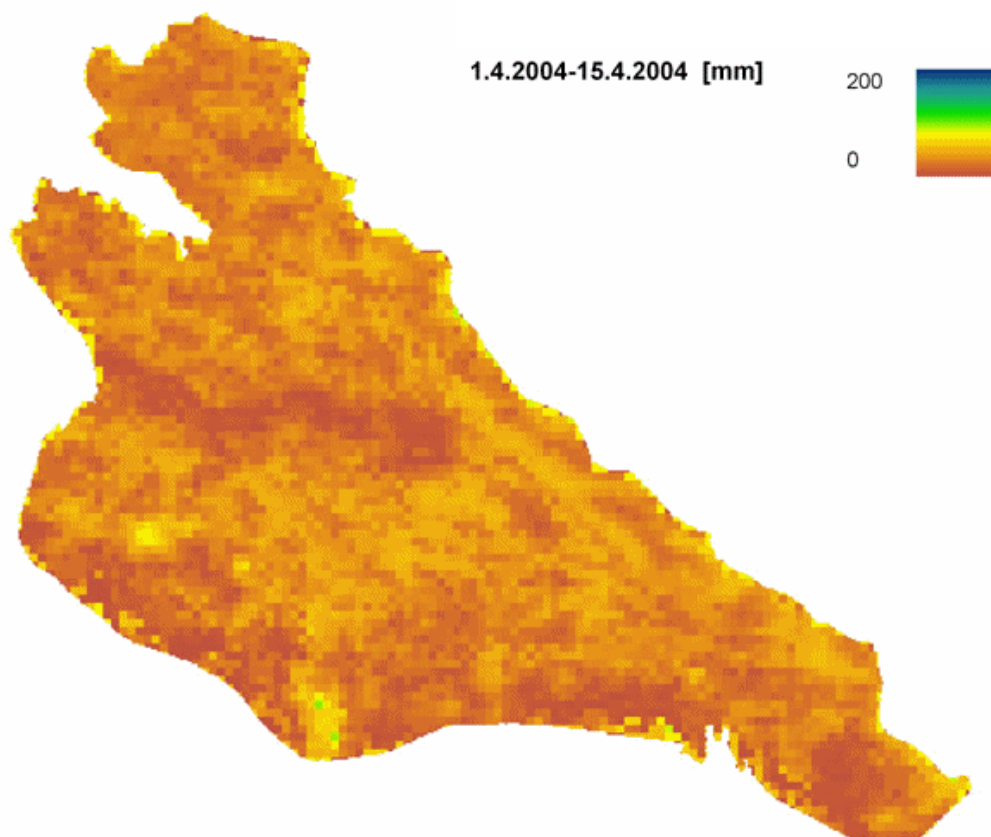
Temporal Vegetation Signal

Classification





15day Evapotranspiration Product



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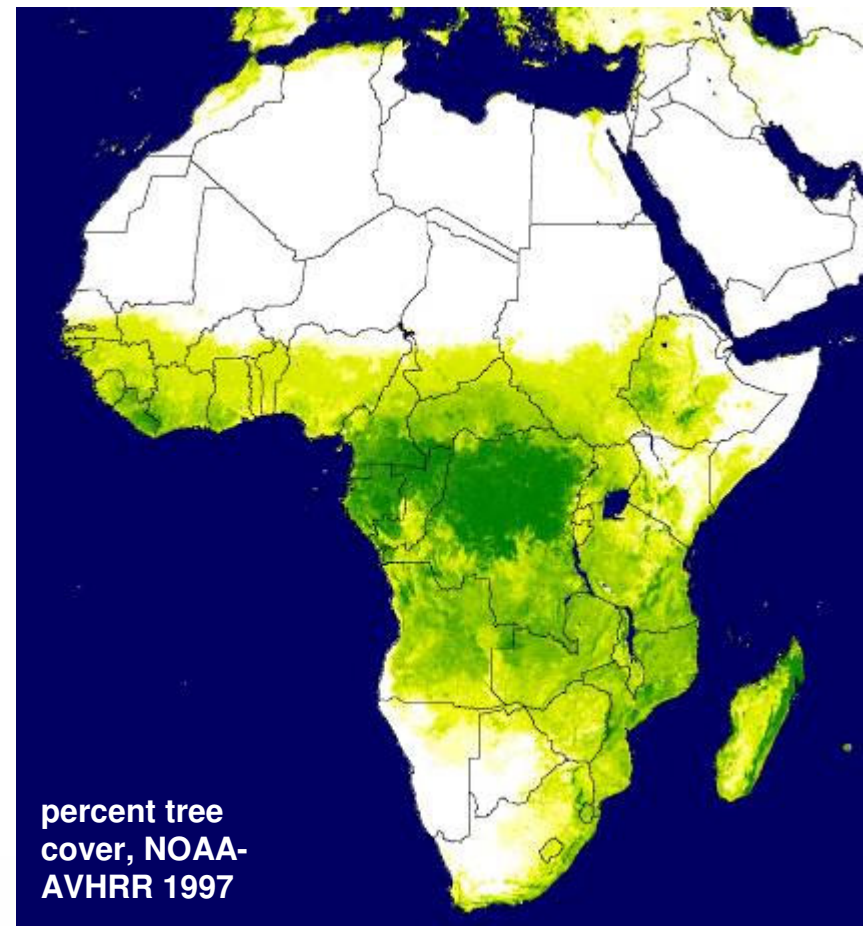
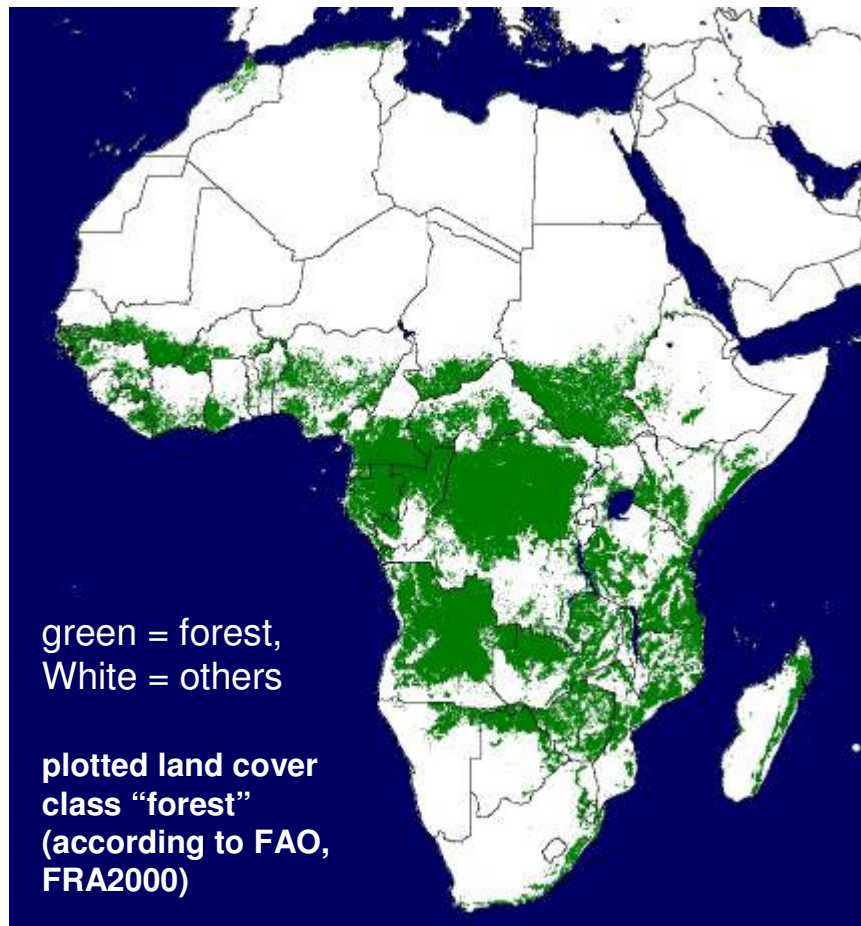
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Forest Cover versus Forest structure, discrete vs. continuous



Pan-European Forest Monitoring Service

P6 Support to National UNFCCC and Kyoto Protocol Reporting on LULUCF Activities

Forest Information Up-date

Support to Environmental Monitoring

Detection and Post-monitoring of Natural and Human Induced Forest Disturbances

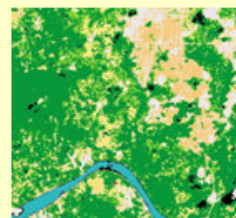
Support to Management and Reporting Obligations of LULUCF CDM Projects

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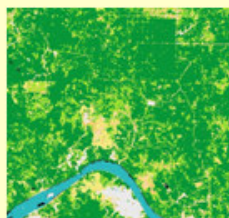
Landsat TM 1991



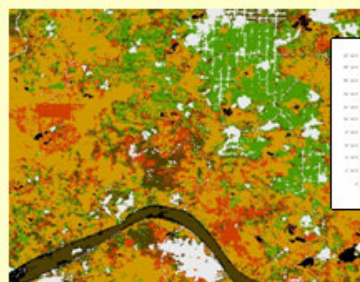
Landsat ETM 2001



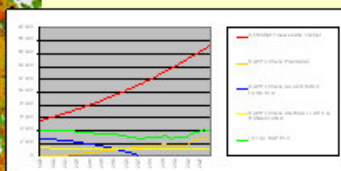
Land cover 1991



Land cover 2001



Land cover change 1991-2001



Proof of additional carbon benefits by new forestry projects

Users:

Project developers for LULUCF projects (Kyoto Protocol, Art. 12)

Services:

- Consistent and cost effective method to assess the baseline (without project case)
- Proof of additionality
- Land Cover/Land Cover Change Mapping for Clean Development Mechanism (CDM),
- Baseline Definition for afforestation and reforestation projects
- In some countries the only feasible way of assessing land use and change

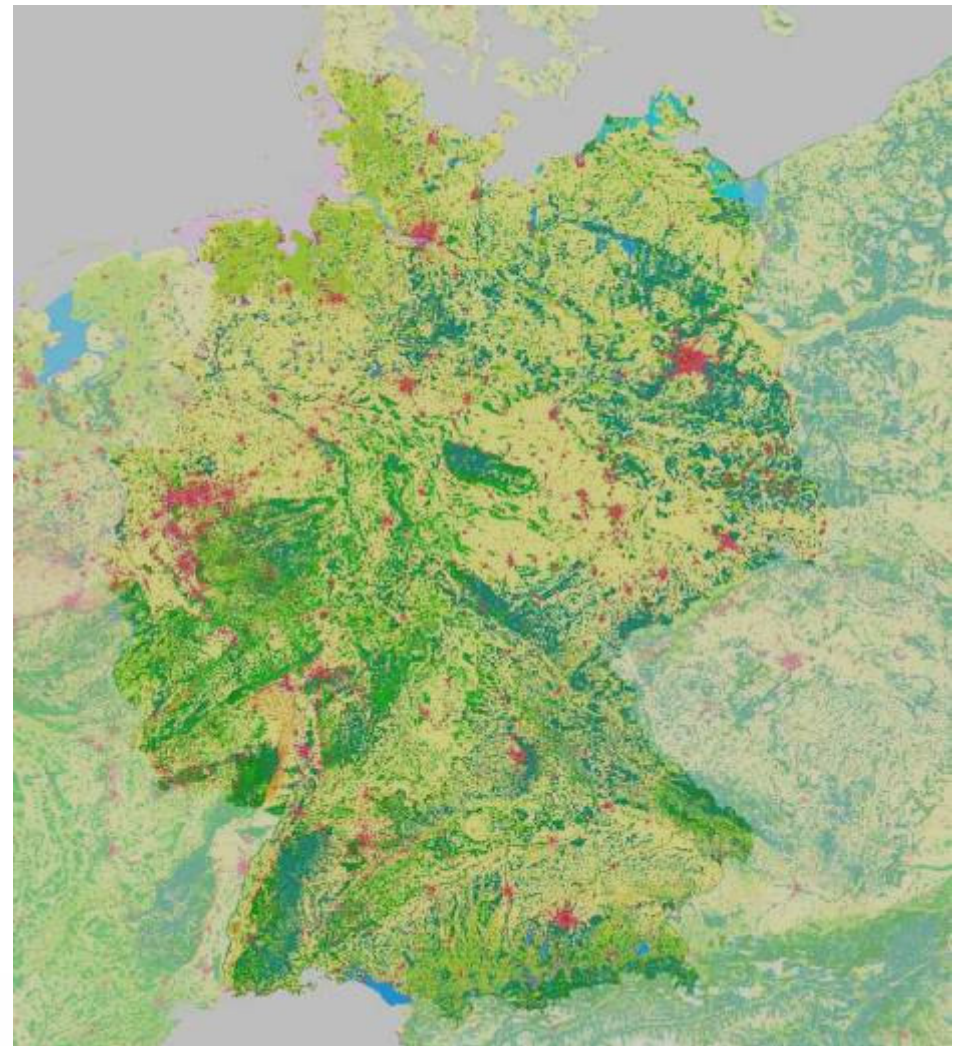


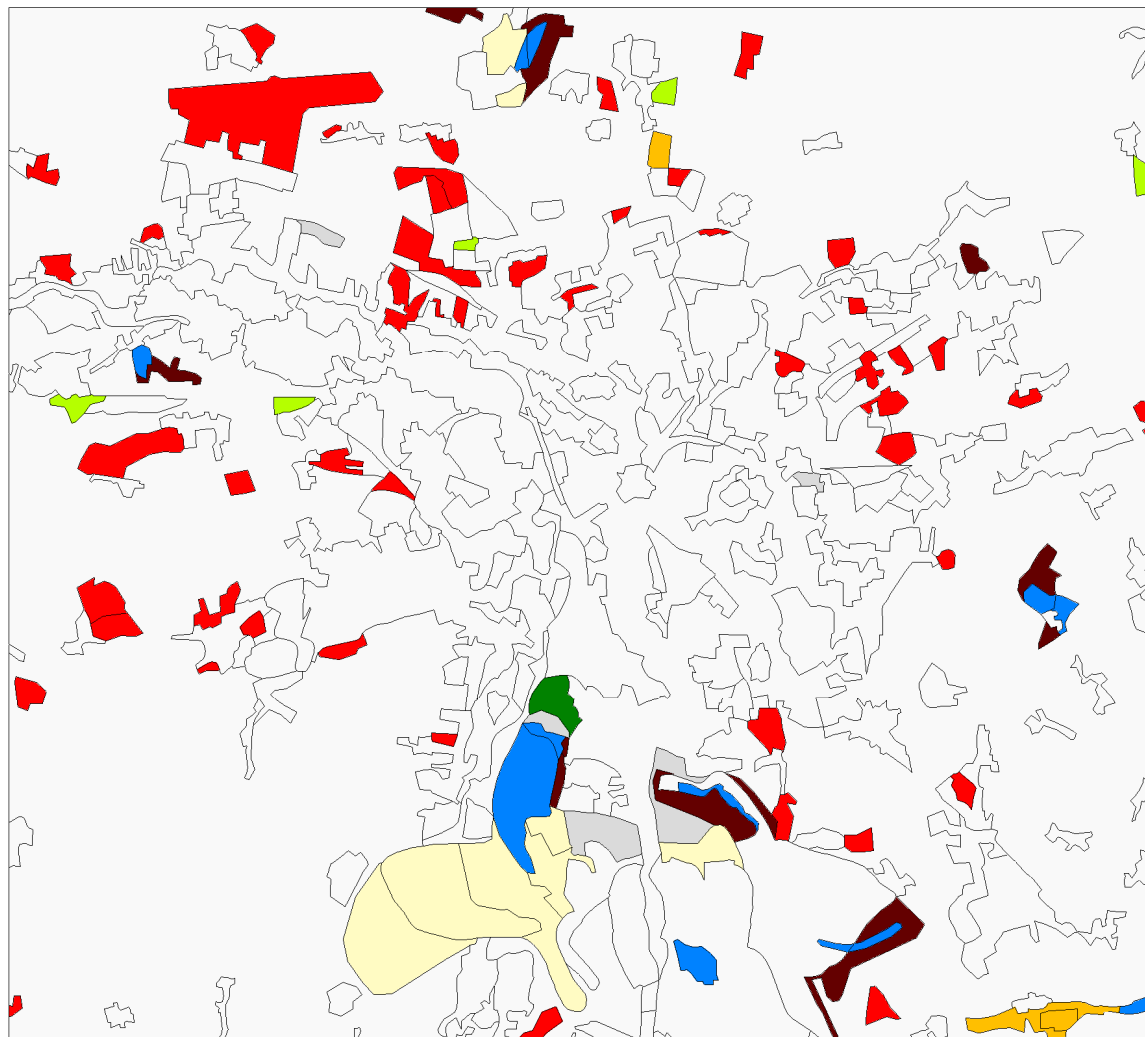
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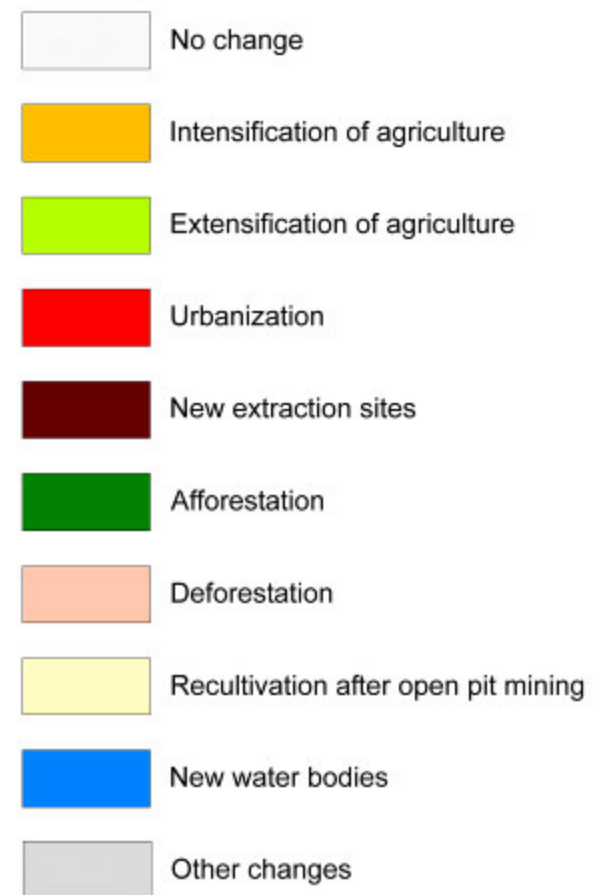
Project Corine (I-III) 1990-2006

- data base on land use
- in all European countries
- harmonized method
- classification key
- Visual GIS-supported interpretation
- Mapping unit 25 ha, 5 ha for land use changes
- Landsat-7 ETM + statistics of 1999 to 2001
- IRS-P6 LISS3/SPOT5 Data + statistics of 2005/2006





Development of land cover





Muchas Gracias por su atención

Preguntas:

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