



EUROPEAN COMMISSION
DIRECTORATE-GENERAL
Joint Research Centre

Joint Research Centre



Towards the European Forest Data Centre (EFDAC)

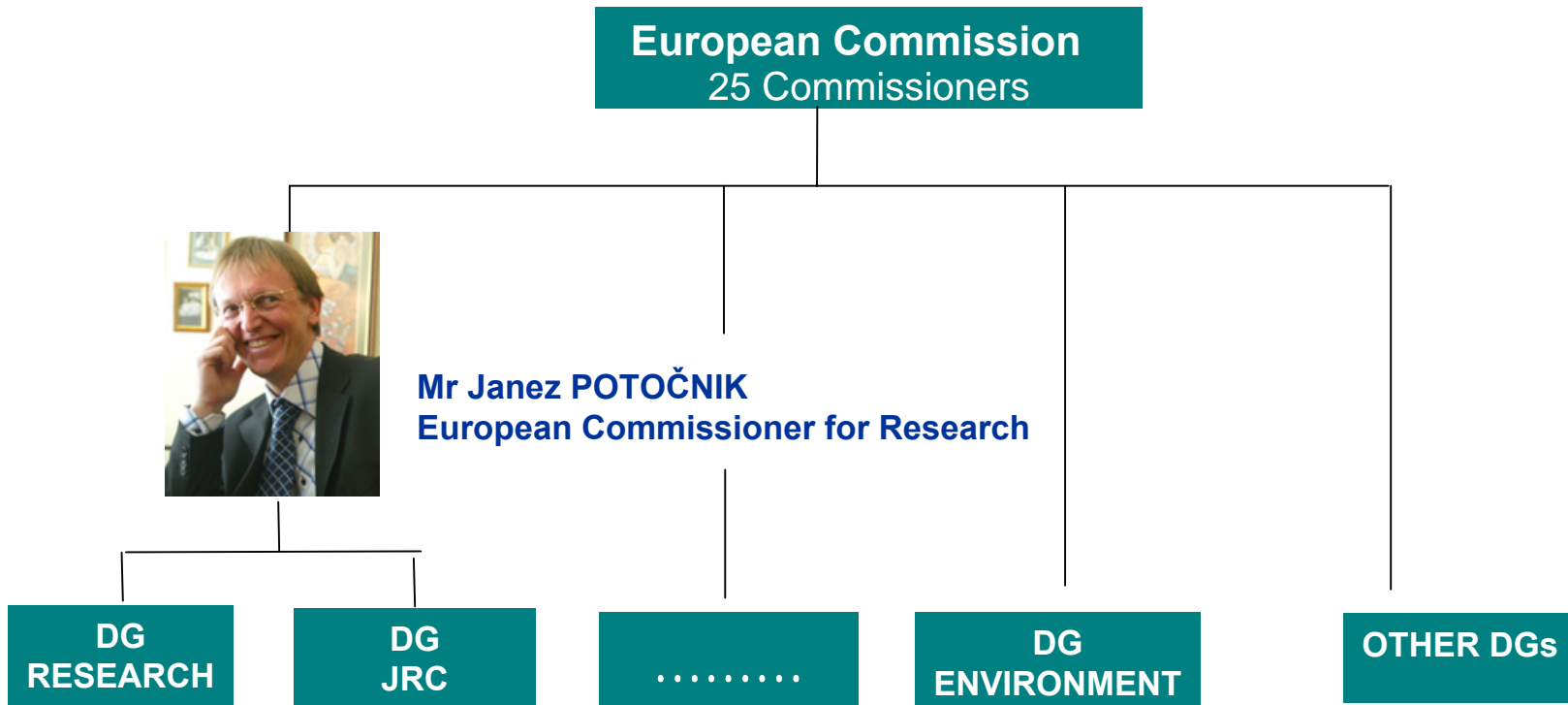
**Land Management and Natural Hazard Unit
INFOREST**

Andrea Camia



What is the Joint Research Centre?

The JRC is a Directorate General of the European Commission





JRC's Mission

The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies.

As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union.



Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.



Structure of the JRC

Staff: 2200 – Budget: 300 million Euro / year

7 Institutes in 5 Member States

IE - Petten (The Netherlands)

- *Institute for Energy*

IRMM - Geel (Belgium)

- *Institute for Reference
Materials and Measurements*

ITU - Karlsruhe (Germany)

- *Institute for Transuranium
Elements*

IPSC - IHCP - IES - Ispra (Italy)

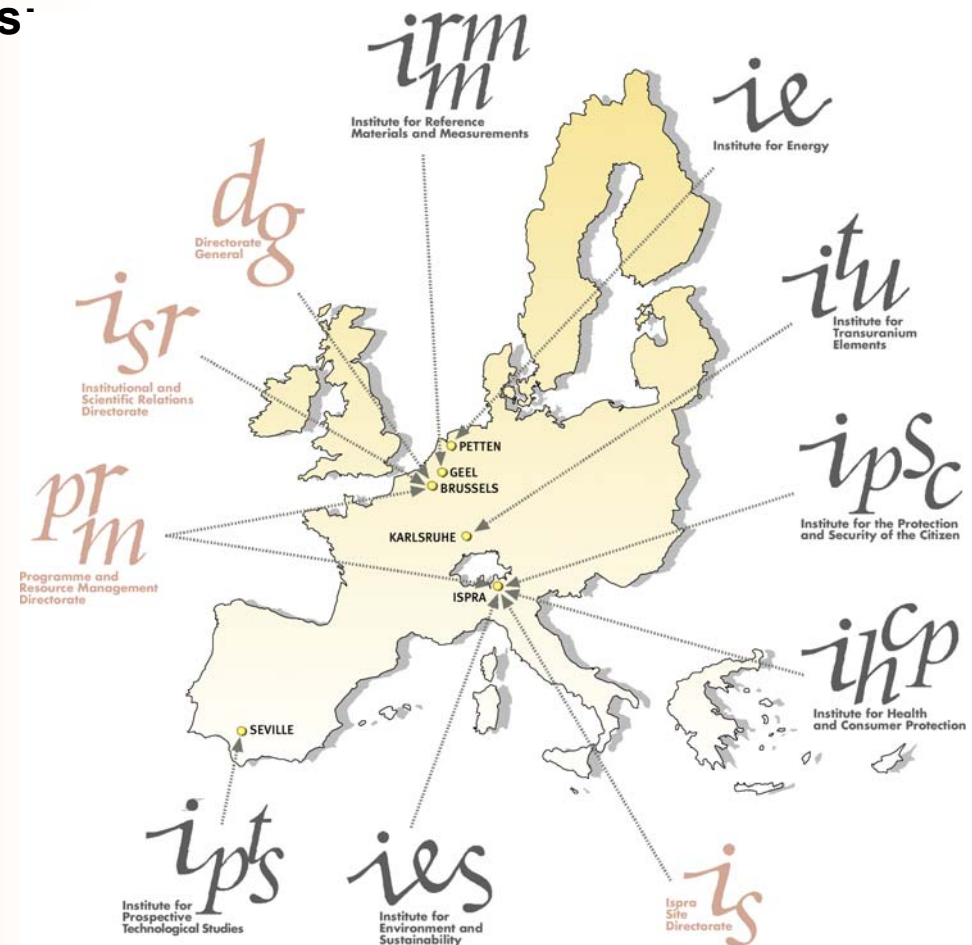
- *Institute for the Protection and
the Security of the Citizen*

- *Institute for Health and
Consumer Protection*

- *Institute for Environment and
Sustainability*

IPTS - Seville (Spain)

- *Institute for Prospective
Technological Studies*





Towards the European Forest Data Centre (EFDAC)

**Land Management and Natural Hazard Unit
INFOREST**

Andrea Camia



1. **Some forest monitoring activities of INFOREST under Forest Focus (Reg. EC 2152/2003)**
 - **EU monitoring of Forest Condition**
 - Building the Forest Focus database
 - Data analysis and reporting of forest condition in the EU
 - **EU monitoring of Forest Fires**
 - Operation and further development of EFFIS (European Forest Fire Information System)
 - **Development of new monitoring aspects (research and coordination of activities)**
 - Forest Biodiversity (forest cover and forest pattern analysis)
2. **Forest information and communication system**
 - **EFICP (European Forest Information and Communication Platform). Follow-up of EFICS (European Forest Information and Communication System)**
3. **Towards the European Forest Data Centre**



Distribution of Level I and Level II Plots

- **Level I**
~5700 plots, crown condition data.
- **Level II**
~860 plots, data from 10 different surveys.



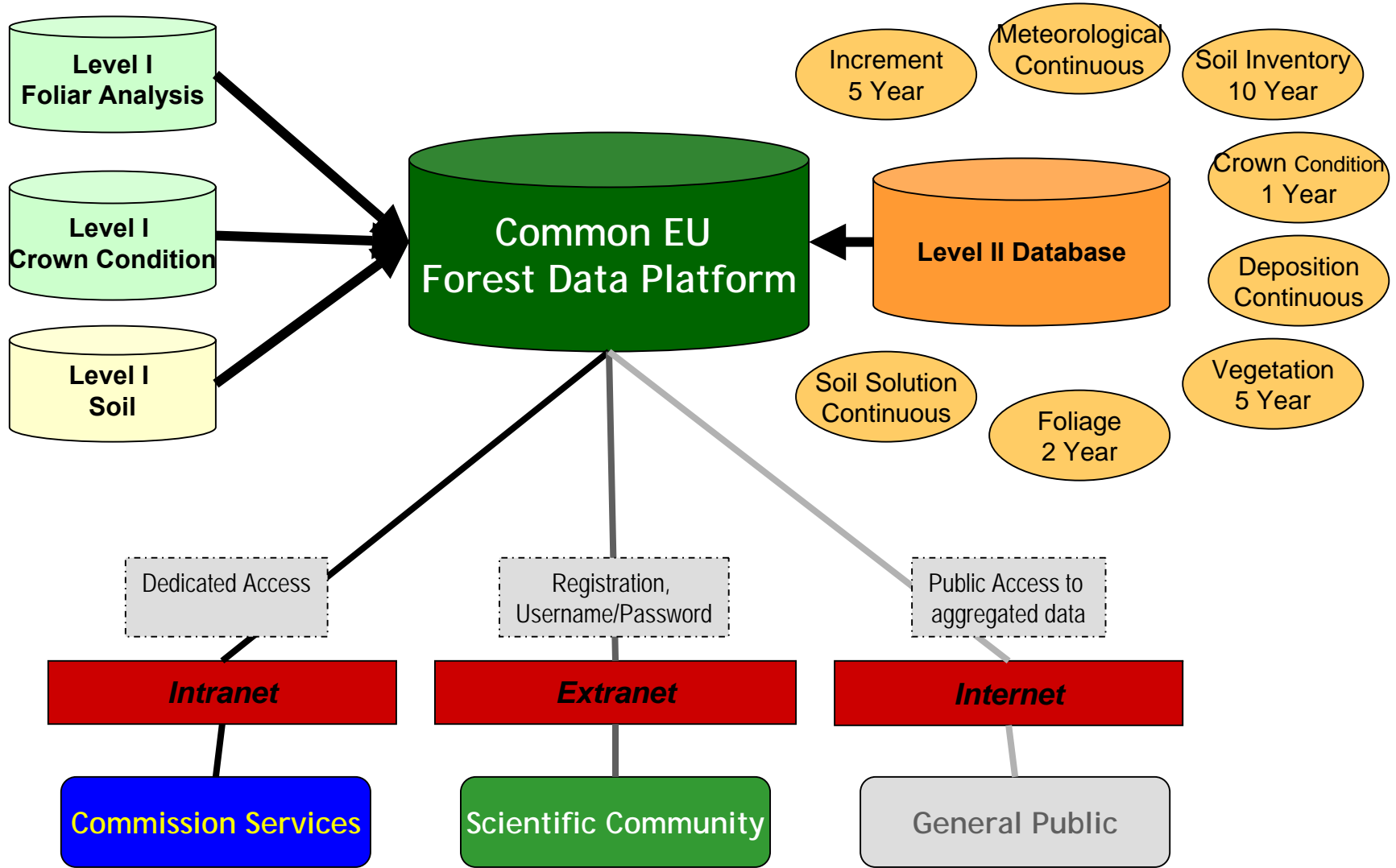
Forest Condition – *Forest Focus database*

SURVEYS CONDUCTED	LEVEL I		LEVEL II	
CROWN CONDITION	annually	all plots	at least annually	all plots
FOLIAR CHEMISTRY	once until now	1497 plots	every 2 years	all plots
SOIL CHEMISTRY	once until now	5289 plots	every 10 years	all plots
Soil Solution Chemistry			continuously	part of the plots
Tree Growth			every 5 years	all plots
Ground Vegetation			every 5 years	all plots
Atmospheric Deposition			continuously	part of the plots
Ambient Air Quality			continuously	part of the plots
Meteorology			continuously	part of the plots
Phenology			several times per year	optional
Remote Sensing			Preferably at plot installation	optional



Forest Condition – *Forest Focus database*

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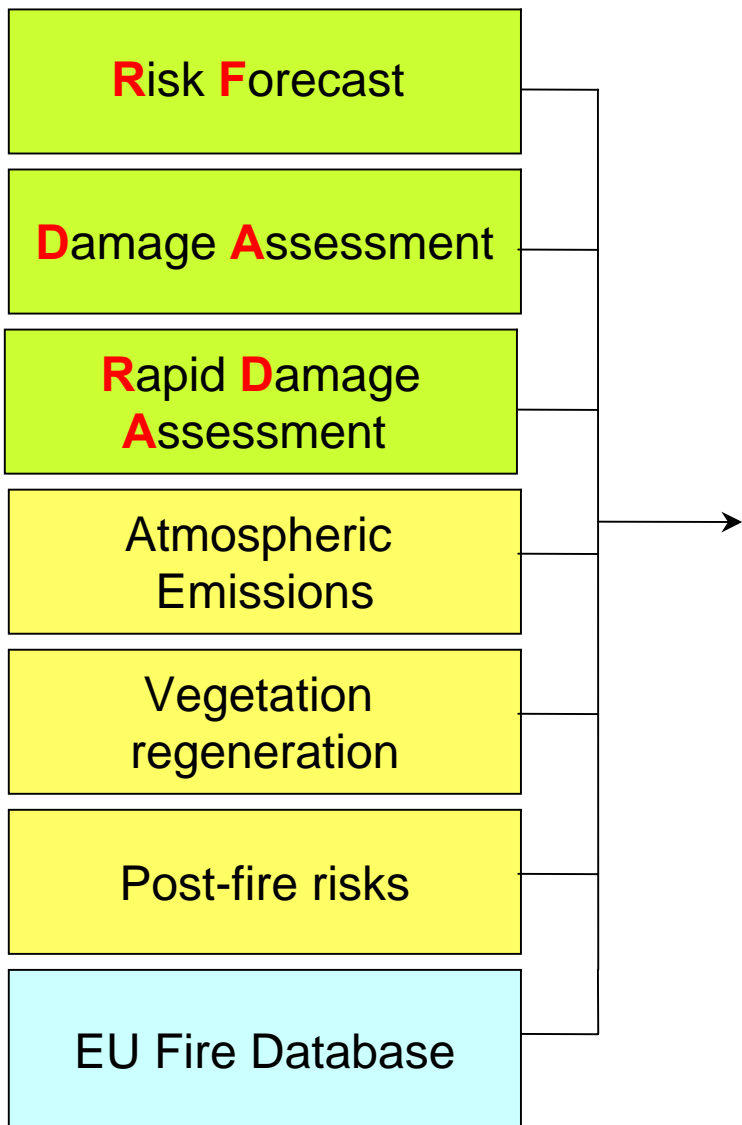


Forest Fires

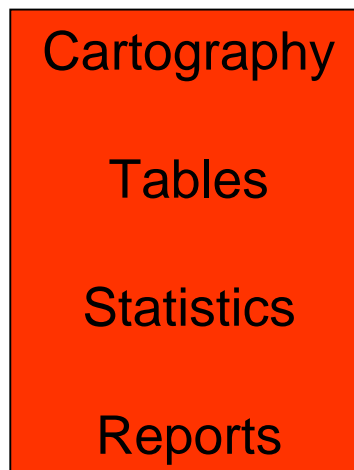
European Forest Fire Information System (EFFIS)

Joint Research Centre

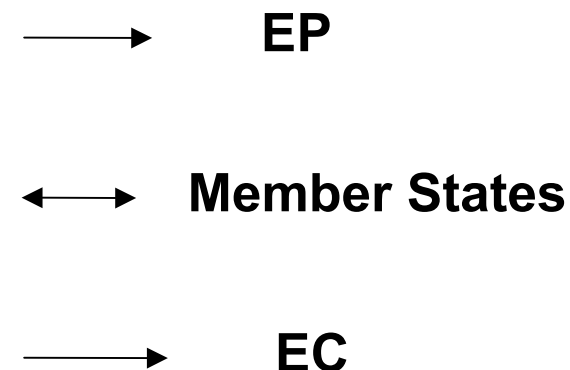
Modules:



Products:



Customers and Users:

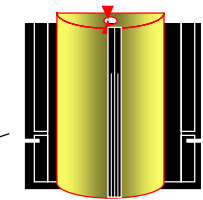
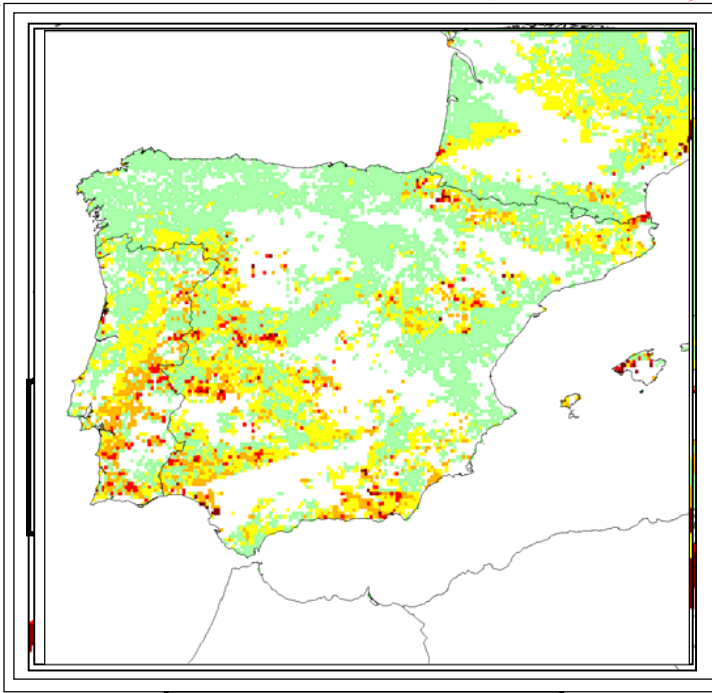
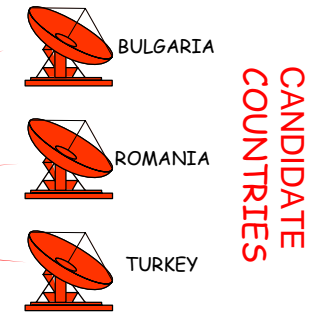
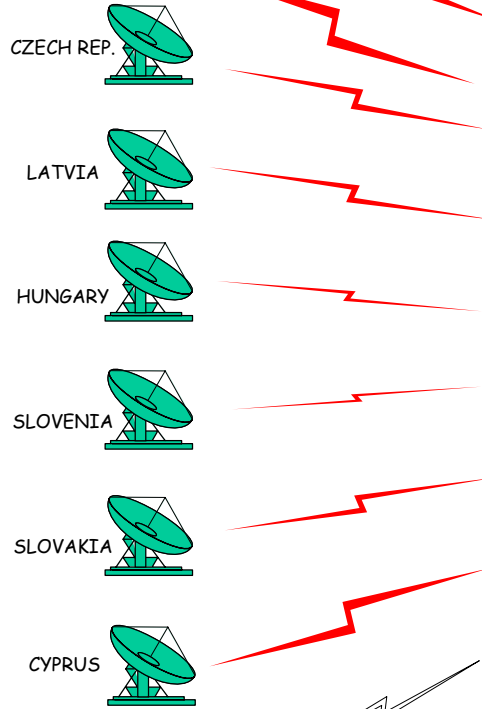




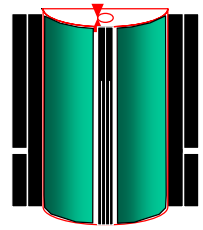
EFFIS – Risk Forecast

Joint Research Centre

DG ENV



FIRE RISK MODELS



METEOROLOGICAL MODELS

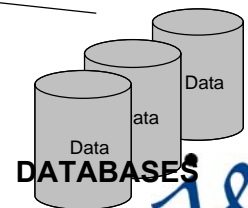
European Forest Fire Risk Forecasting System

Index: Fire Potential Index
Day: 2005-08-01 (1 Day Forecast)

Level of Risk	Color
Very Low	Light Green
Low	Yellow
Moderate	Orange
High	Red
Very High	Dark Red

Meteorological Data from MeteoFrance
Administrative Boundaries from EUROSTAT - GISCO
Application by JRC - INFOREST Action

EUROPEAN COMMISSION
DG Environment - B3 / A5
DG Joint Research Center - IES



DATA DATABASES



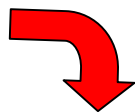
RESEARCHERS



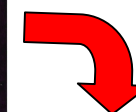
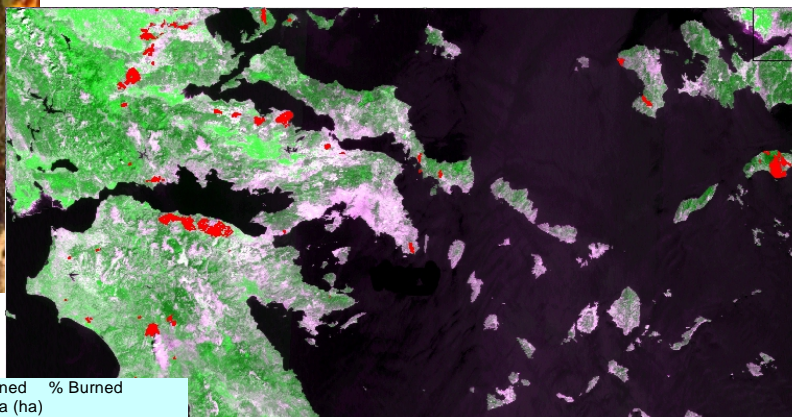


EFFIS – Damage Assessment

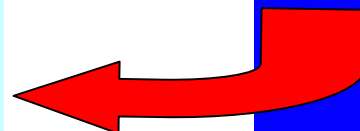
Fire event



Mapping of burnt areas



Damage Analysis

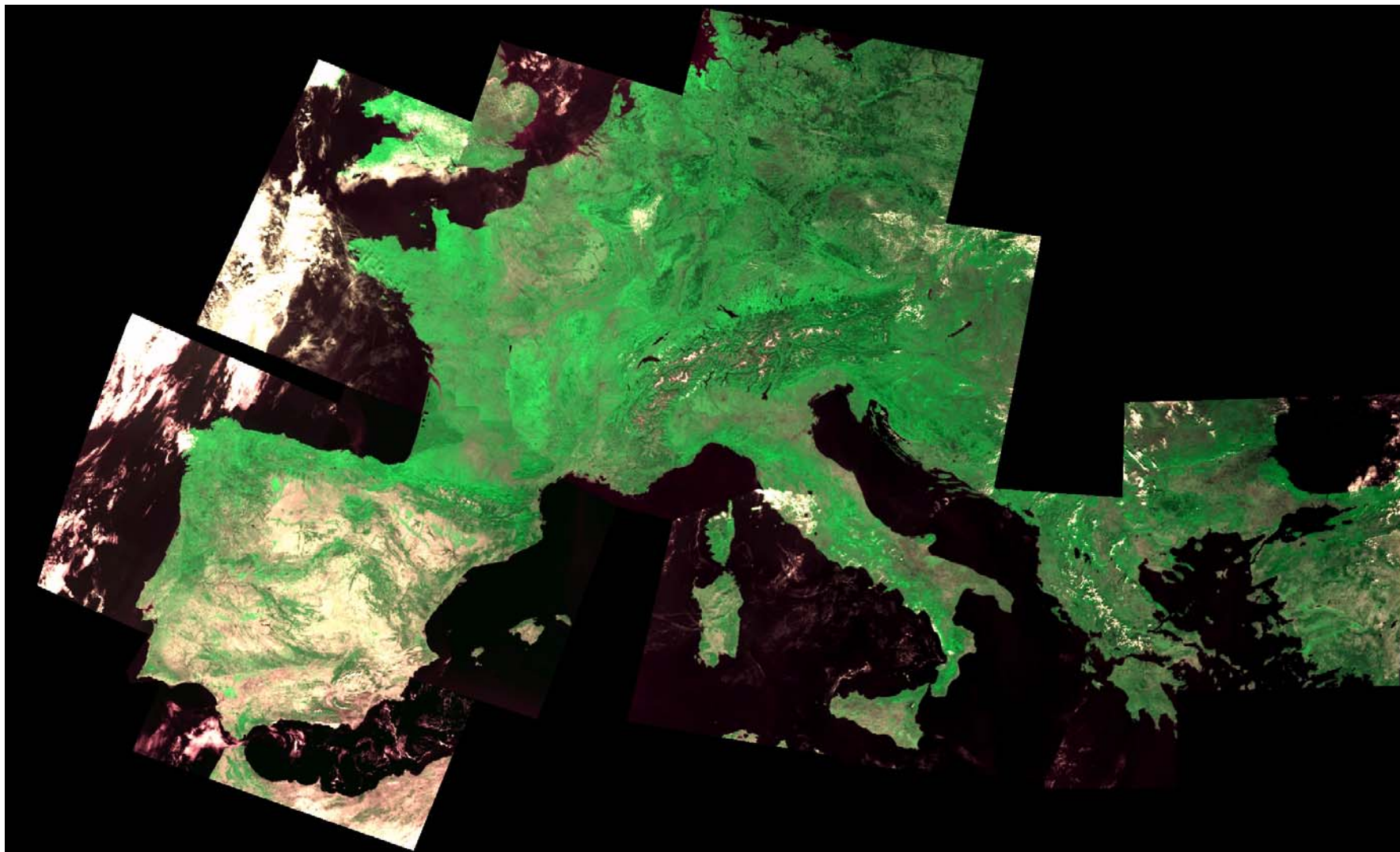


CORINE Code	CORINE Class	Non-Burned Area (ha)	Burned Area (ha)	% Burned
112	DISCONTINUOUS URBAN FABRIC	109878	42	0.0%
211	NON-IRRIGATED ARABLE LAND	1194065	6990	0.6%
212	PERMANENTLY IRRIGATED LAND	682939	403	0.1%
221	VINEYARDS	134274	2843	2.1%
222	FRUIT TREES AND BERRY PLANTATIONS	123157	1398	1.1%
223	OLIVE GROVES	518360	2421	0.5%
241	ANNUAL CROPS ASSOCIATED WITH PERMANENT CROPS	16563	10	0.1%
242	COMPLEX CULTIVATION PATTERNS	1007677	5040	0.5%
243	LAND PRINCIPALLY OCCUPIED BY AGRICULTURE, WITH SIGNIFICANT AREAS OF NATURAL VEGETATION	773877	11269	1.4%
244	AGRO-FORESTRY AREAS	164627	2314	1.4%
311	BROAD-LEAVED FOREST	840208	1006	0.1%
312	CONIFEROUS FOREST	526430	3812	0.7%
313	MIXED FOREST	573425	3930	0.7%
321	NATURAL GRASSLAND	1247403	6448	0.5%
322	MOORS AND HEATHLAND	260835	1628	0.6%
323	SCLEROPHYLLOUS VEGETATION	2070419	25793	1.2%
324	TRANSITIONAL WOODLAND-SHRUB	1044180	5266	0.5%
331	BEACHES, DUNES, AND SAND PLAINS	31072	68	0.2%
332	BARE ROCK	22903	59	0.3%
333	SPARSELY VEGETATED AREAS	249691	437	0.2%
334	BURNT AREAS	19081	2102	9.9%
	UNCLASSIFIED FOREST SURFACES	1371987	17445	1.3%
	TOTAL	12983050	100724	0.8%



EFFIS – Damage Assessment

Joint Research Centre



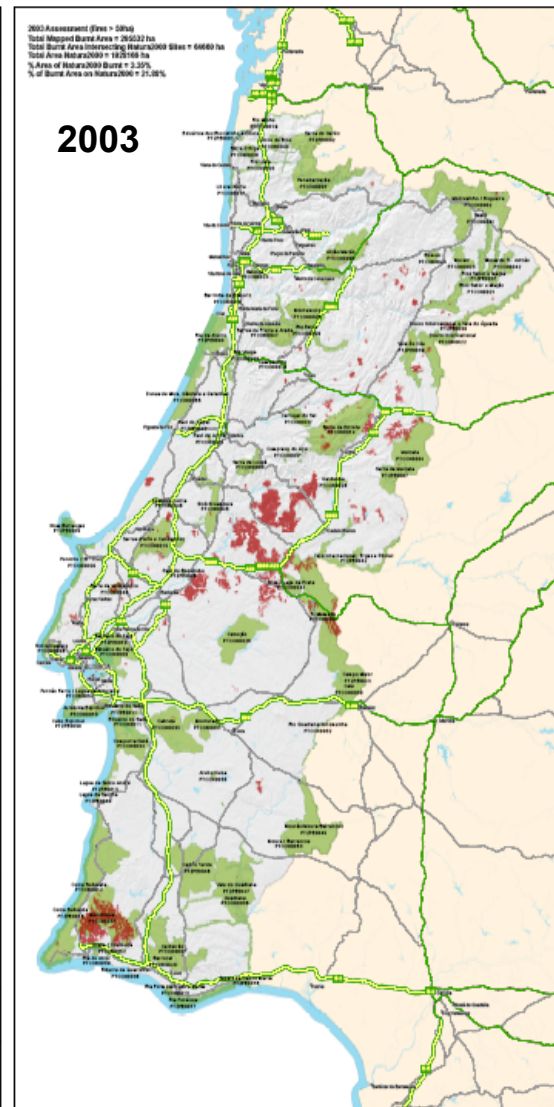
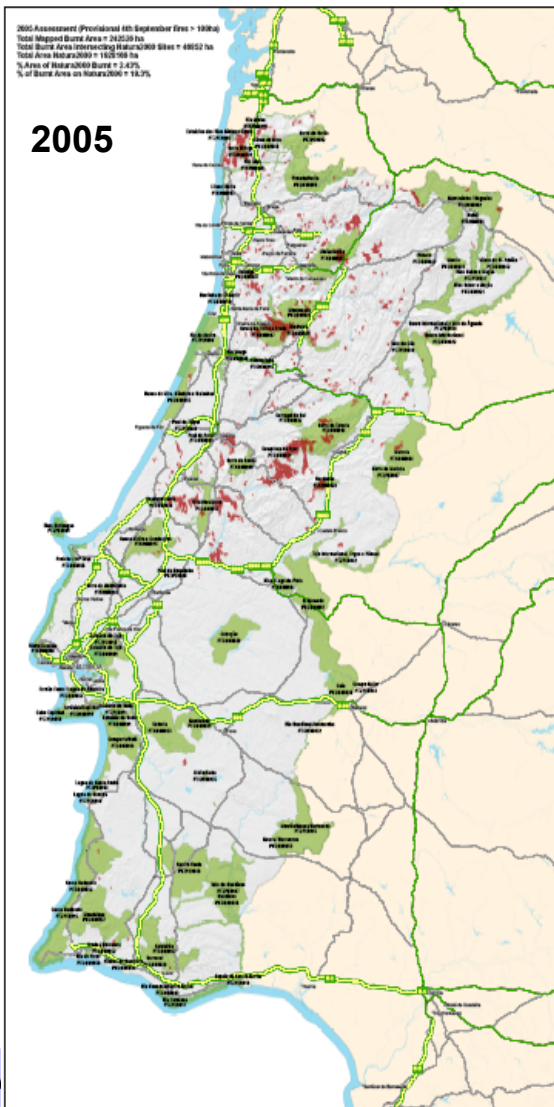


EFFIS – Damage Assessment

242 526 ha burnt
19.3% on Natura2000 sites
2.43% of Natura2000 sites

94 123 ha burnt
36.27% on Natura2000 sites
1.78% of Natura2000 sites

379 038 ha
21.88% on Natura2000 sites
3.5% of Natura2000 sites

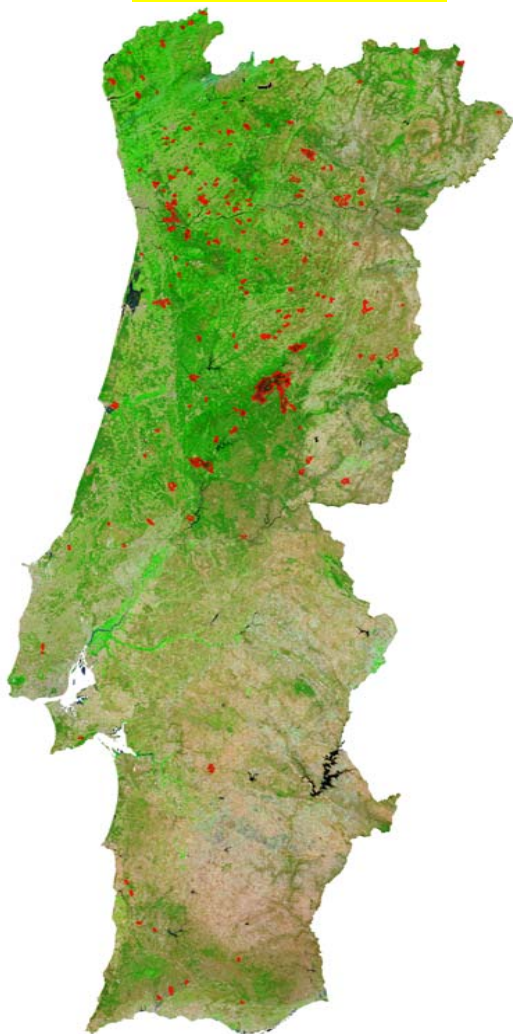




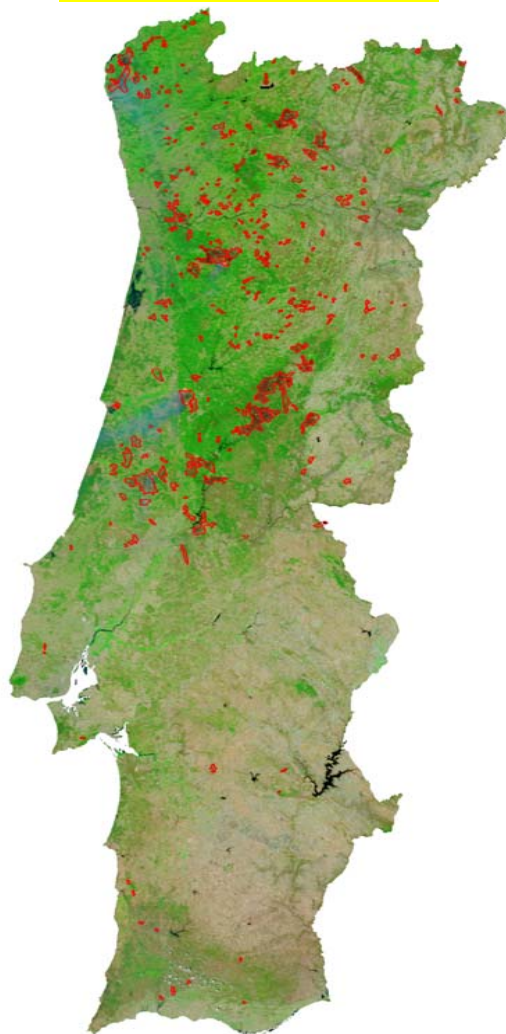
EFFIS - Rapid Damage Assessment

Joint Research Centre

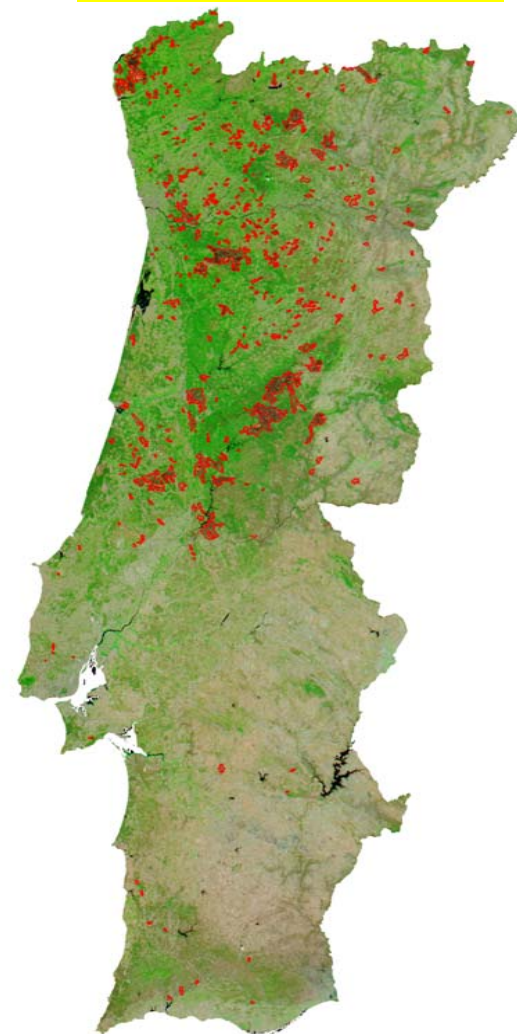
31 July 2005
76 238 ha



22 August 2005
221 062 ha



4 September 2005
242 537 ha

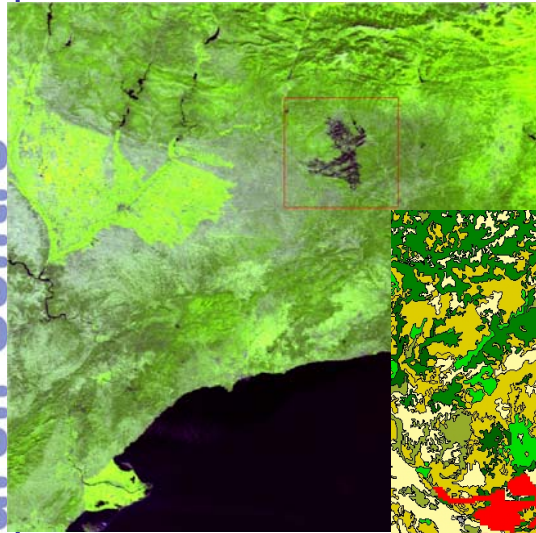




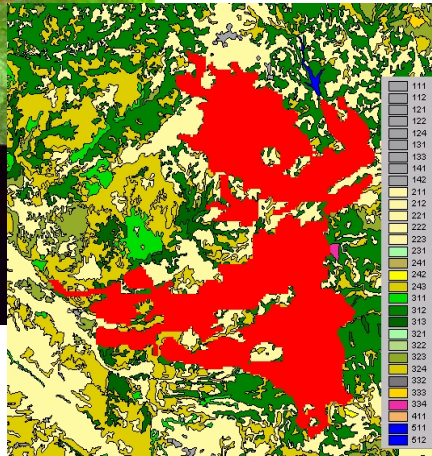
EFFIS – CO₂ Emissions (research)

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A_v burned area (m²)



B_v biomass (g m⁻²)



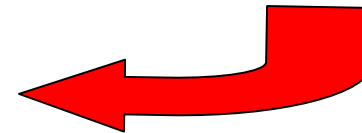
$$CO_2 = \sum_v A_v \times B_v \times C \times E_v$$

C burning efficiency (g g⁻¹)



E_v emission coefficient for CO₂

Regional estimates of CO₂ emissions





EU Fire Database

WHEN ?

FIRE TIME

- Date and Time of first alert
- Date and Time of first intervention
- Date and Time of fire extinction

WHERE ?

FIRE LOCATION

- Country
- NUTS level 3 code (province)
- NUTS level 5 code (commune)

HOW ?

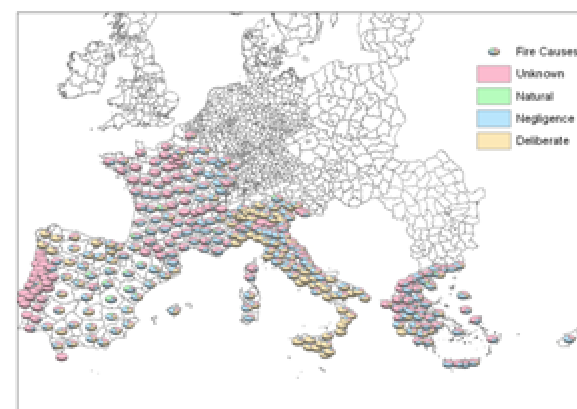
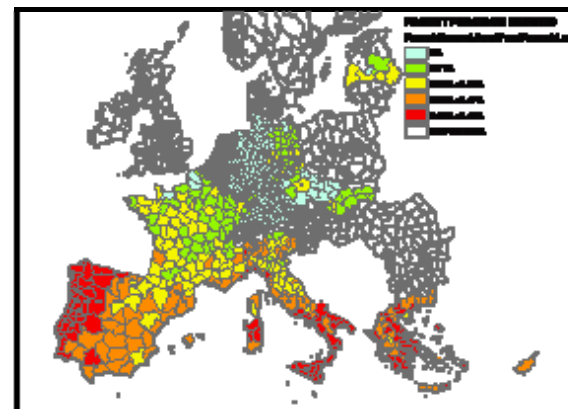
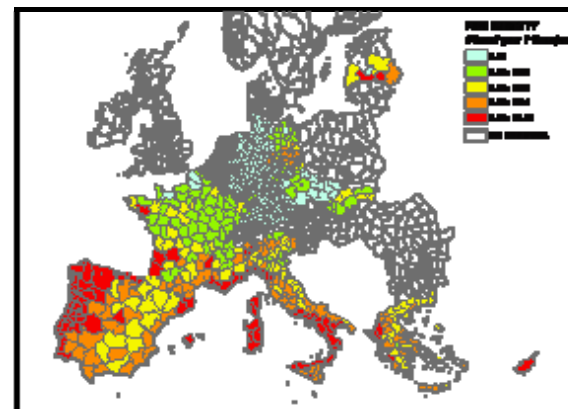
FIRE SIZE

- Total Burned Area
- Forest Burned Area
- Non Forest Burned Area

WHY ?

FIRE CAUSES

- Presumed cause (4 classes)





The European Forest Fire Information System Newsletter

Issue 2005 (2)
September 2005



CONTENTS	
1.	Introduction
2.	Forest fire risk trend up to 10 September 2005
3.	Assessment of fire damages up to 4 September 2005





Risk Forecast System

- Fire Risk
- Index: Canadian FW
- Day: Period
- Function: Average
- Forecast: 1 days
- Draw**

Damage Assessment System

- Burnt Areas (>50 ha)
- Year 2000
- Year 2001
- Year 2002
- Year 2003
- Draw**

Rapid Assessment System

- Burnt Areas (>100 ha)
- Year 2004
- Draw**

EU Fire Database (by province)

- Fires
- 1994
- Number of Fires
- Burnt Areas
- Average Fire Size
- Draw**

Atmospheric Emissions

Vegetation Regeneration

Doc-Fire Risk

THEMES

- Country Names
- DEM
- Land Cover: CORINE Level3
- Fuel Map:
- WIFS-IRS: 2000

Legend:

- Continuous Urban Fabric
- Discontinuous Urban Fabric
- Industrial or Commercial Un
- Road and Rail Networks and
- Port Areas
- Airport Areas
- Mineral extraction sites
- Dump sites
- Construction sites
- Green Urban Areas
- Sport and Leisure facilitie
- Non-irrigated arable land
- Permanently irrigated land
- Rice fields
- Vineyards
- Fruit trees and berry plant
- Olive groves
- Pastures
- Annual crops associated wit
- Complex cultivation pattern
- Land principally occupied b
- Agro-forestry areas
- Broad-leaved forest
- Coniferous forest
- Mixed forest
- Natural grassland
- Moors and heathland
- Sclerophyllous vegetation
- Transitional woodland shrub
- Beaches, dunes and sand pla

EFFIS Web Map

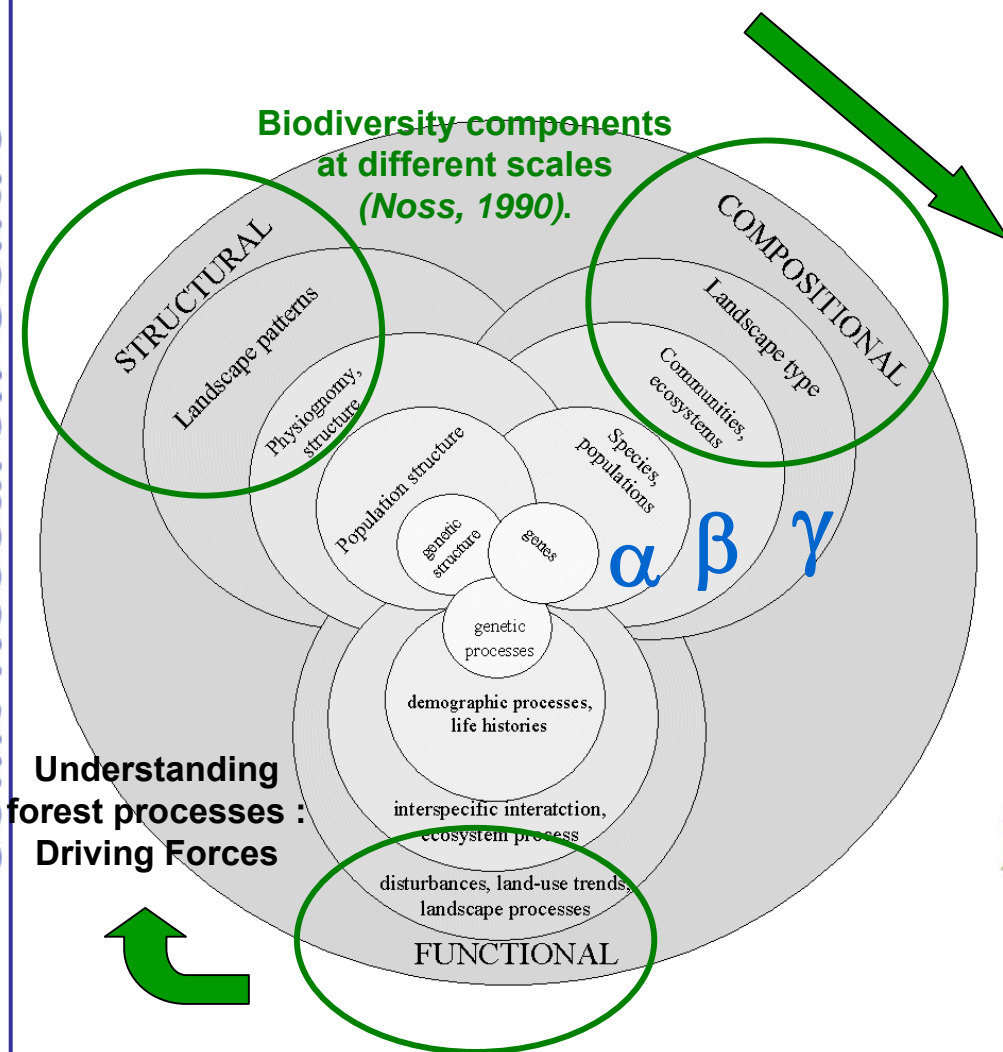
EFFIS web site (<http://effis.jrc.it>)



Forest biodiversity (forest area & pattern)

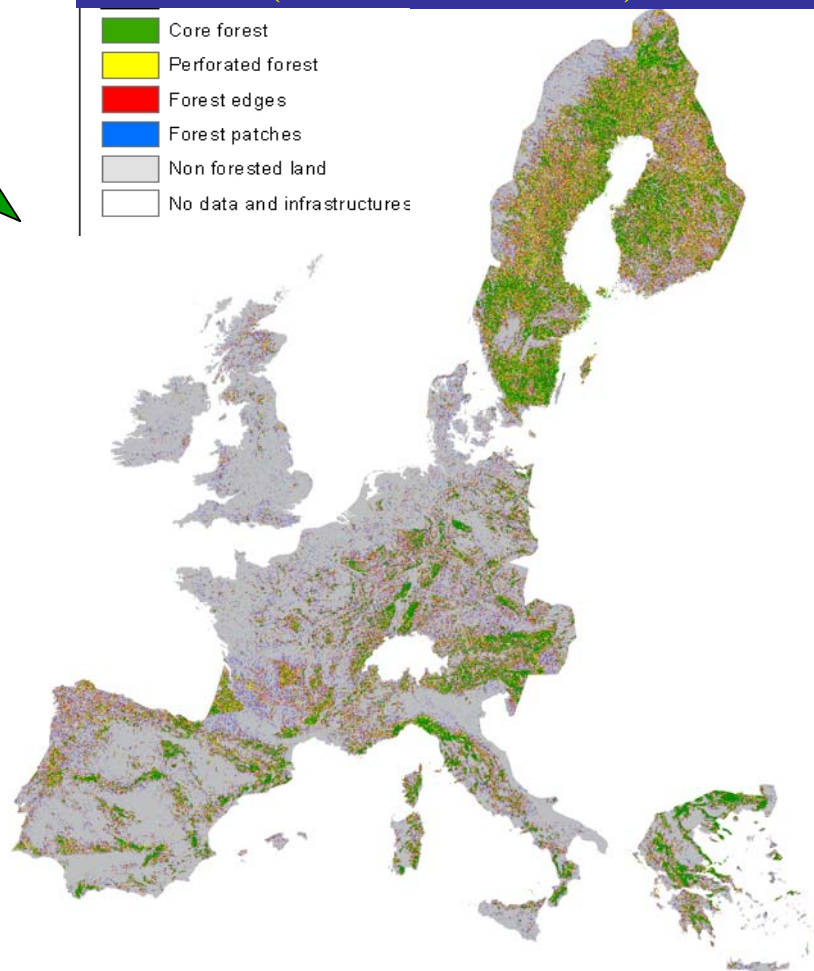
Forest Landscape pattern and changes

Joint Research Centre



Forest Landscape Pattern (MCPFE Indicator)

- Core forest
- Perforated forest
- Forest edges
- Forest patches
- Non forested land
- No data and infrastructures





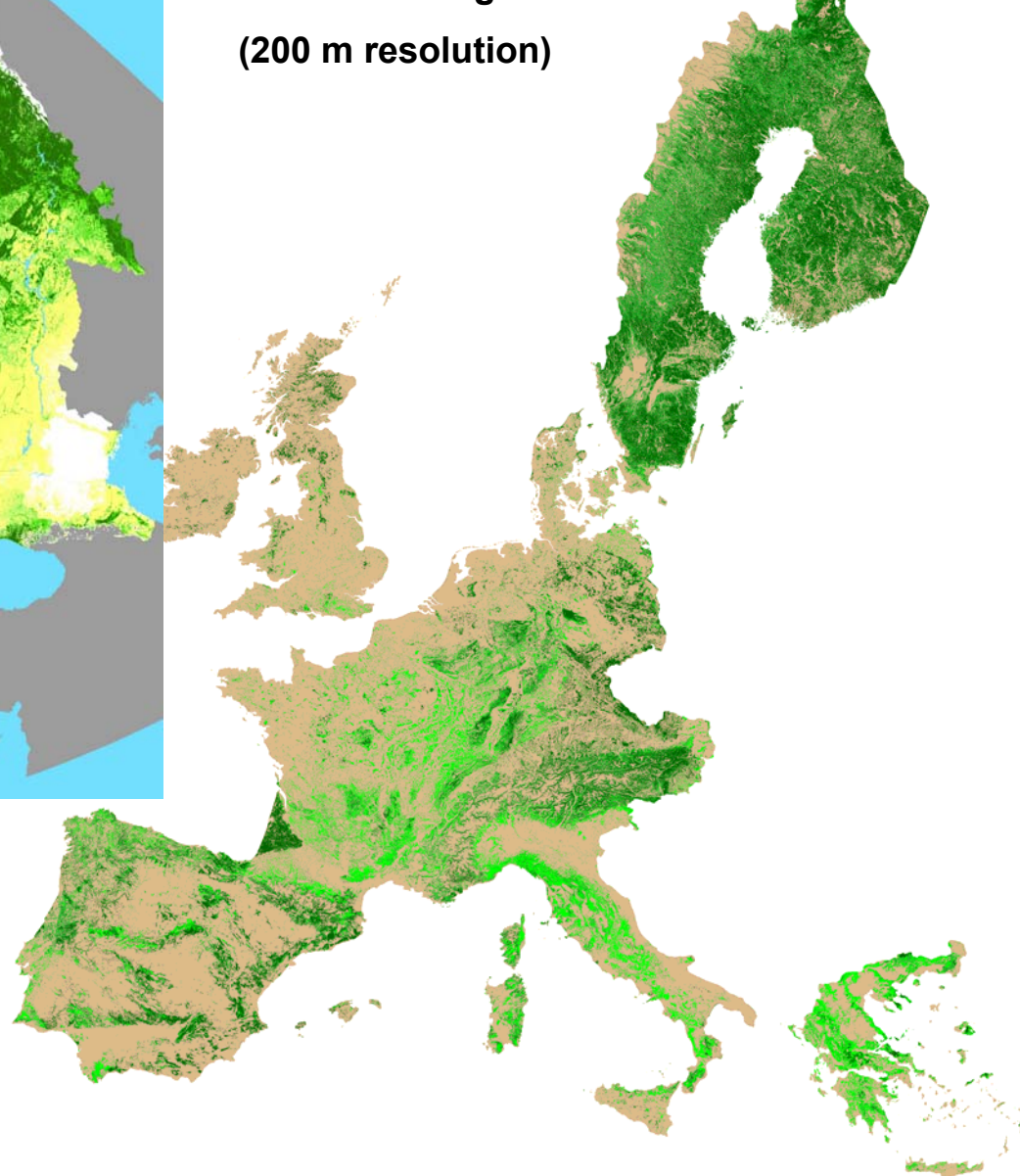
Forest mapping for biodiversity analysis (forest area & pattern)

Joint Research Centre



**Forest Proportion – from NOAA-AVHRR
(1 km resolution)**

**IRS WIFS image mosaic classification
(200 m resolution)**





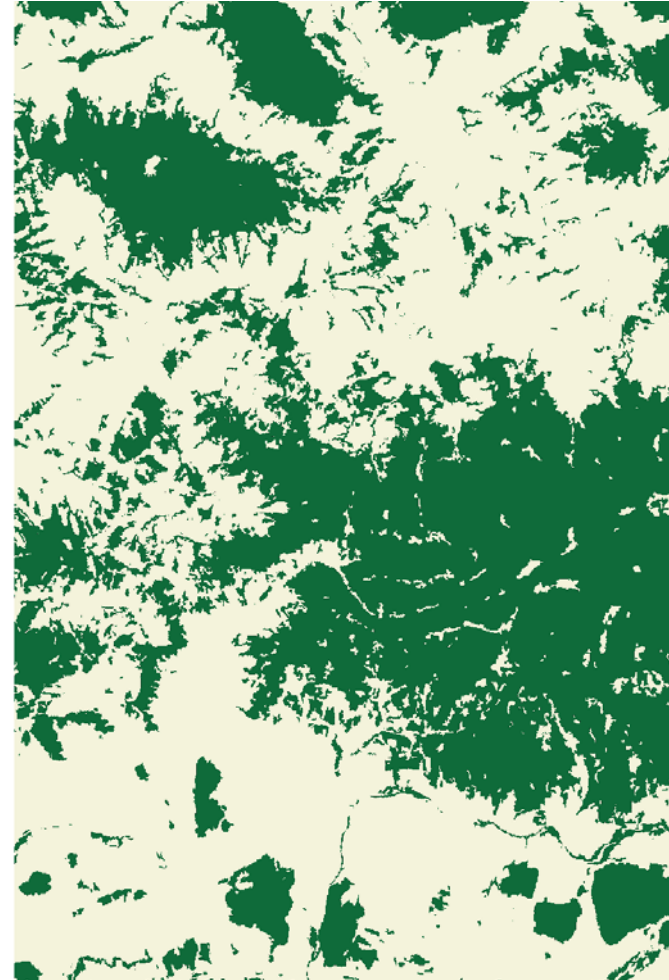
Forest biodiversity (*forest area & pattern*)

Effect of the spatial resolution on forest pattern

CORINE LC (100m raster, SE 9ha):



Landsat (25m, SE <1ha):

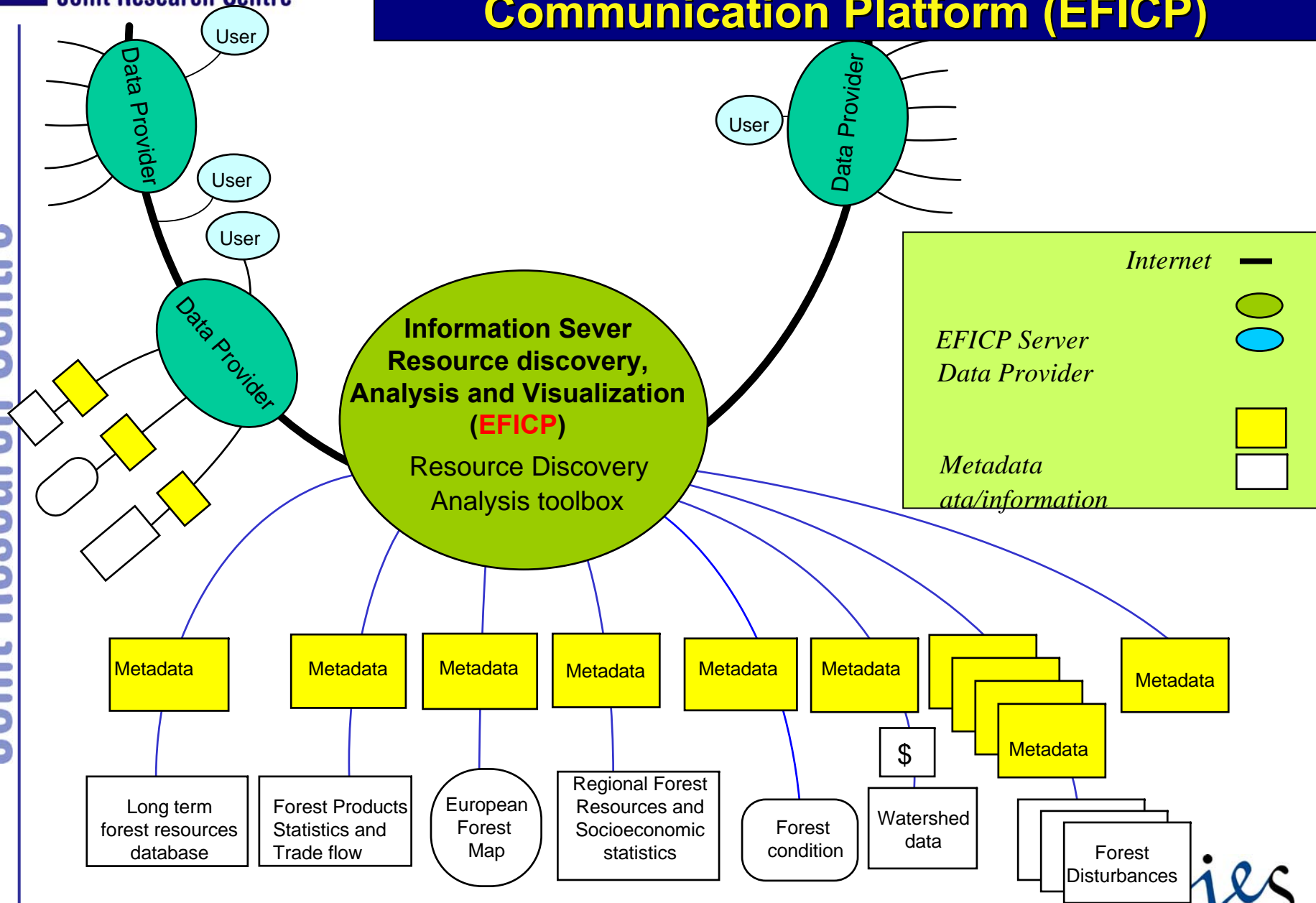


5 0 5 10 15 20 km



European Forest Information and Communication Platform (EFICP)

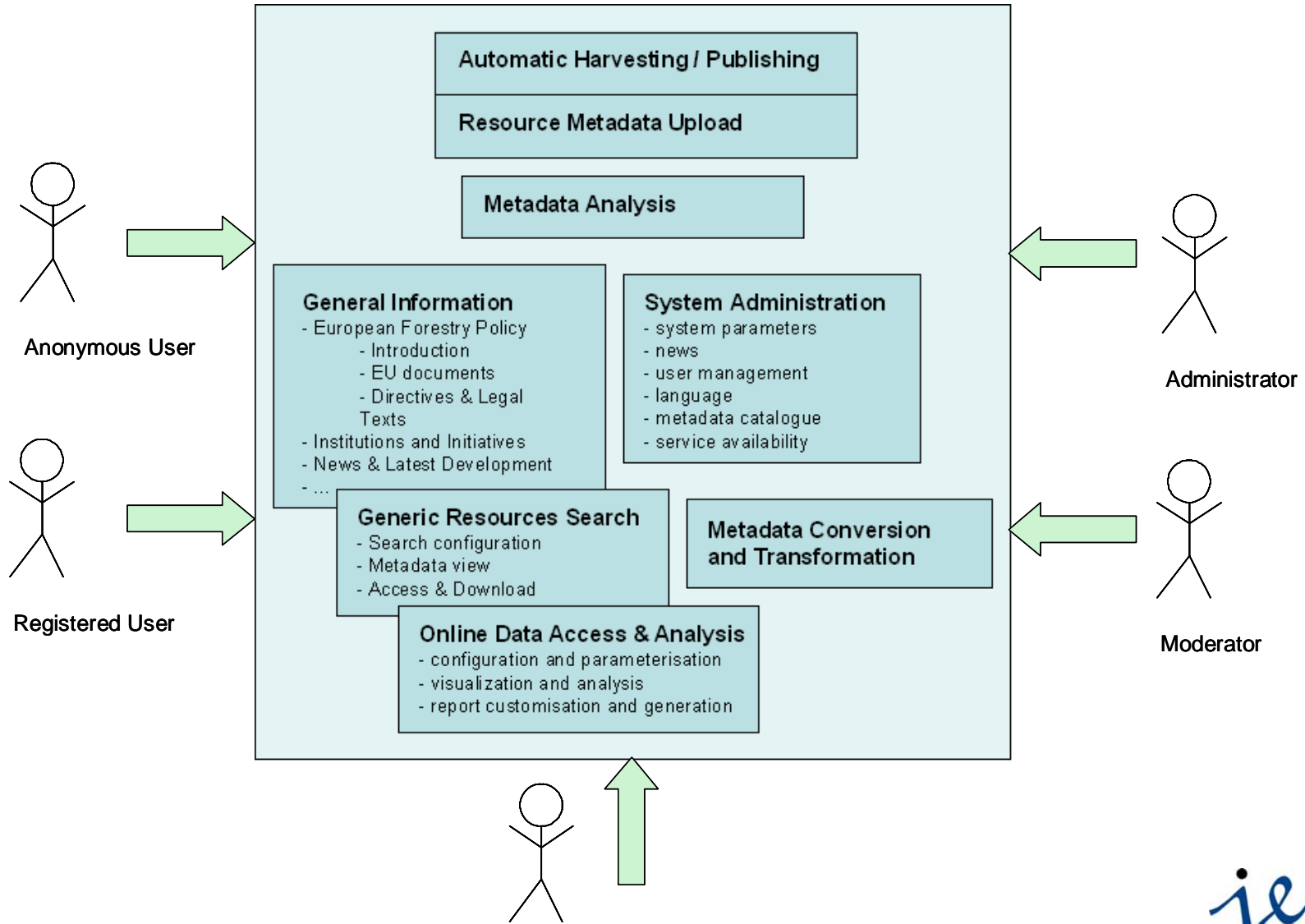
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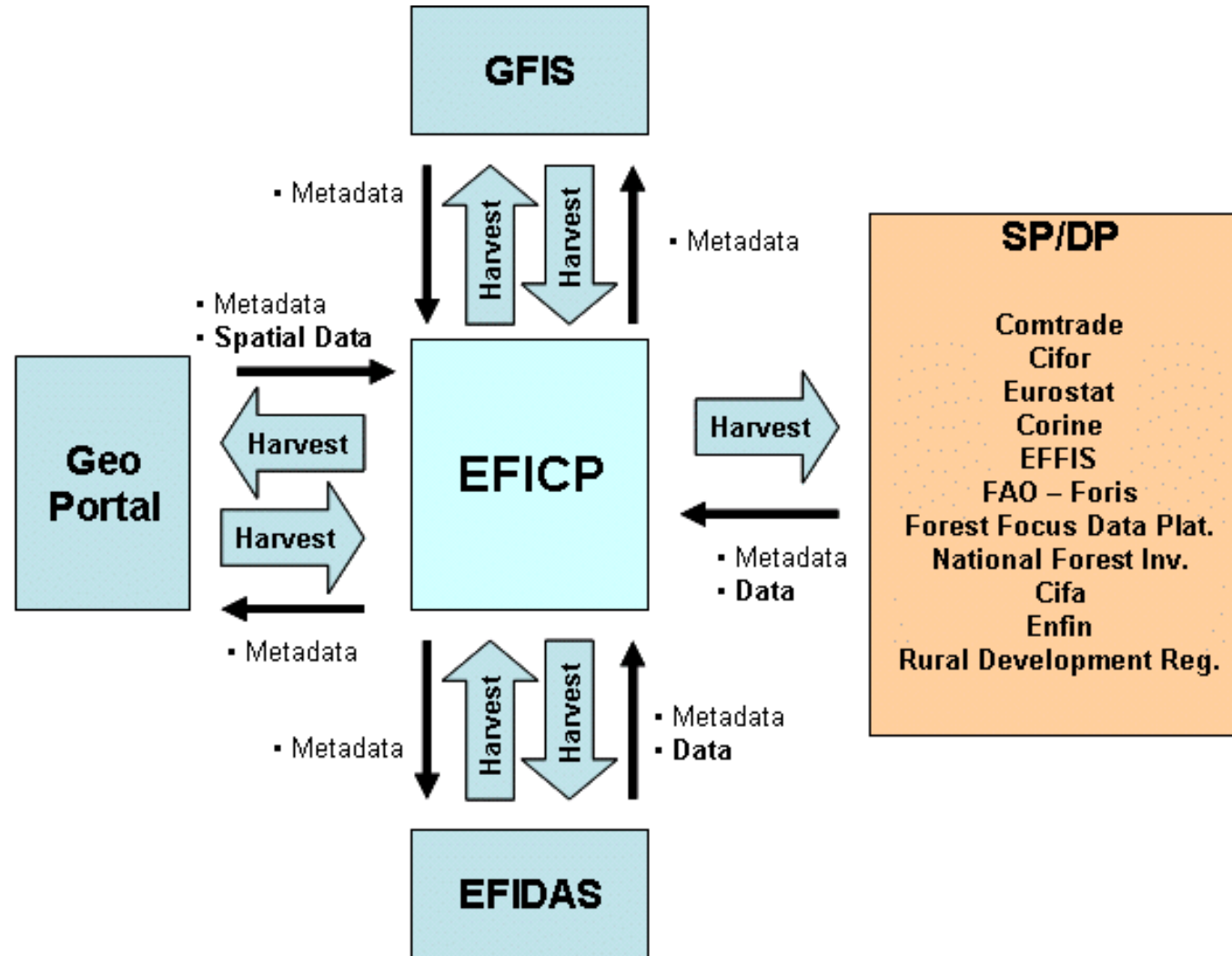
EFICP Major System Functions and Use Scenarios

Joint Research Centre





EFICP and external systems





Towards the European Forest Data Centre

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Data requirements



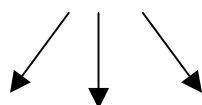
Data collection/
updating



Data management/
harmonization



Data dissemination



DG ENV, MS



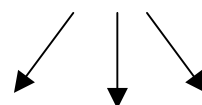
Nat. Focal Centers
Nat. F. Fire Services
Nat. F. Inventories
Remote sensing



Qa and Qc



Forest Focus db
EFFIS
EFICP



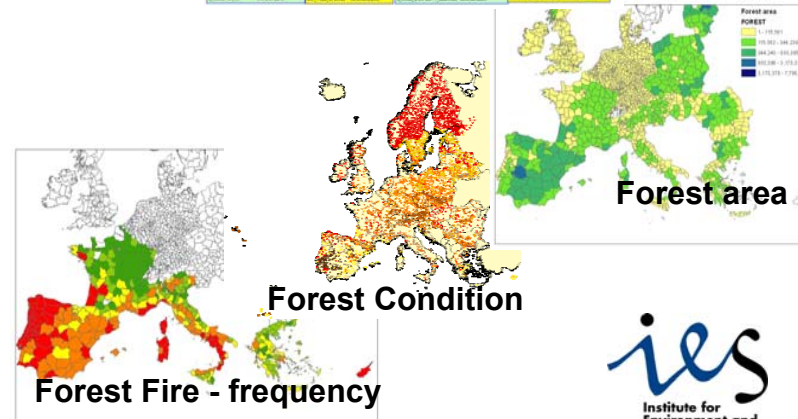
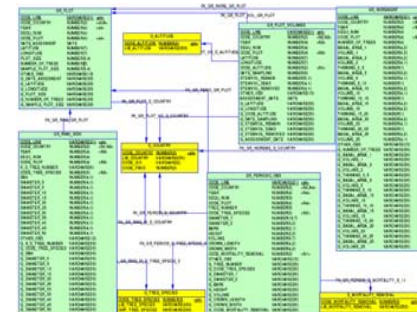
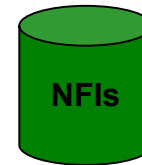
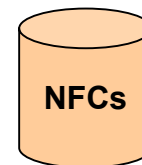
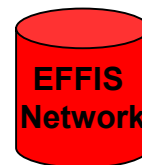
Fire record
Fire ID
Date & Time of ignition
Date & Time of extinction
Time to intervention
Burnt area
Cause

Forest Condition
•Plot ID
•Country
•Tree species
•Defoliation %
•Discoloration
•Damage

Forest Inventory
Plot ID
Species comp.
Diameter class
Volume class
Dead wood
Damage

European Forest Information sources

National Forest Information sources





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Thank you
for your attention