

Instituto Geográfico Nacional

Centro Nacional de Información Geográfica



Copernicus Land

Nuria Valcárcel





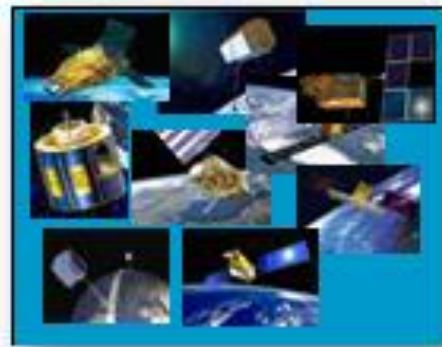
- ❑ Iniciativa de la UE (EC+ESA) para desarrollar capacidades operativas de observación de la Tierra, basadas en infraestructuras de observación del territorio de la UE y de los países miembros
- ❑ Opción estratégica → impacto duradero en el futuro desarrollo político, económico, social y científico de la UE

❖ Programa Copernicus



Sentinels

6 services use Earth Observation data to make ...



Contributing missions



in-situ

...added-value products



Mauro FACCHINI
Copernicus Services Unit
DG Enterprise and Industry
11 December 2014
Overall review of Copernicus programme

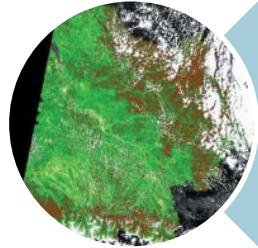


❖ Programa Copernicus

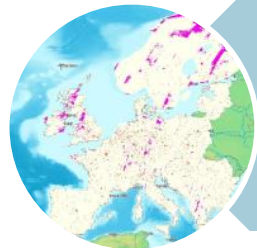


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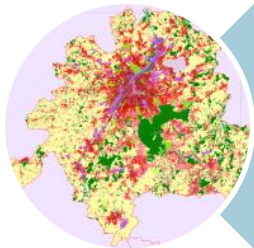




Global



Continental



Local

❖ Servicio Copernicus Land Global

- Producción sistemática de composiciones espaciales y temporal de observaciones globales sistemáticas.
- Producción de variables bio-geofísicos terrestres a escala global y continental
- Reprocesamiento de datos históricos para nuevo análisis y anual entre comparaciones



❖ Servicio Copernicus Land Global

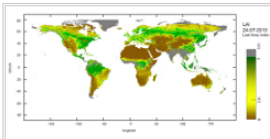
Copernicus Global Land Service
Providing bio-geophysical products of global land surface

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Vegetation State

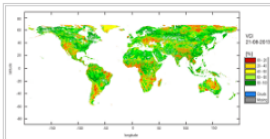
VEGETATION PROPERTIES



Collections

- LAI 1km V1
- FCOVER 1km V1
- FAPAR 1km V1

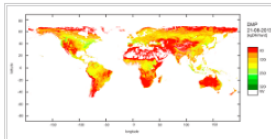
VEGETATION INDICATORS



Collections

- NDVI 300m V1
- NDVI 1km V1
- NDVI 1km V2
- VCI V1
- VPI V1

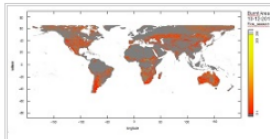
BIOMASS



Collections

- Dry Matter Productivity V1

FIRE DISTURBANCE

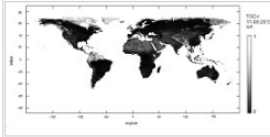


Collections

- Burned Area 300m V1
- Burned Area 1km V1

Energy Budget

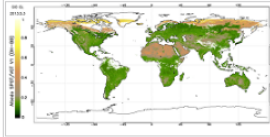
TOP OF CANOPY REFLECTANCE



Collections

- TOCR 1km V1

ALBEDO

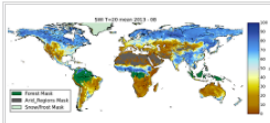


Collections

- Directional Albedo V1
- Bihemispheric Albedo V1

Water Cycle

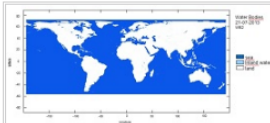
SOIL WATER



Collections

- Soil Water V1

WATER BODIES



Collections

- Water Bodies V1

Version 2.1.14-20151019

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❖ Servicio Copernicus Land Global

The screenshot shows a web browser window displaying the Copernicus Global Land Collection Catalogue search results. The browser address bar shows the URL: <https://land.copernicus.vgt.vito.be/geonetwork/srv/eng/main.home?any=94542540-a0a7-11e0-8264-0800200c9a66>. The page features a search bar on the left with the Copernicus logo and a 'SEARCH THE CATALOG:' section. The main content area displays search results for 'GLOBAL 10-DAILY SPOT-VEGETATION NORMALIZED DIFFERENCE VEGETATION INDEX (10° TILES)'. The results include an abstract, website, data portal, fees, ordering instructions, spatial resolution, spatial extent, and temporal extent. A 'Metadata' button is visible at the bottom of the result entry.

Global land product disc: X

Home | Contact us | Links | About |

Simple Search | Advanced Search

Username: Password: Login

Show map

FIND METADATA IN COPERNICUS GLOBAL LAND COLLECTION CATALOGUE

Aggregated results matching search criteria : 1-1/1 (page 1/1) , 0 selected

Select : all, none actions on selection

GLOBAL 10-DAILY SPOT-VEGETATION NORMALIZED DIFFERENCE VEGETATION INDEX (10° TILES)

Logo

Abstract The Normalized Difference Vegetation Index (NDVI) is a proxy to quantify the vegetation amount. It is defined as $NDVI = \frac{NIR - Red}{NIR + Red}$ where NIR corresponds to the reflectance in the near infrared band (B3 of VEGETATION sensor), and Red to the reflectance in the red band (B2 of VEGETATION sensor). It is closely related to FAPAR and is little scale dependant

Website <http://land.copernicus.eu/global/>

Data Portal <http://land.copernicus.vgt.vito.be/PDF/portal/Application.html#Browse:Root=513186;Time=NORMAL,NORMAL,-1,-1..>

Fees Free by ftp and Eumetcast; cost of medium by DVD or tape

Ordering Instructions Products can be downloaded on-line via HTTP (or FTP) or can be received through EUMETCast satellite reception in Africa and Latin-America. Users can also get the latest datasets in near-real time via FTP after subscription. Through <http://land.copernicus.eu/global/access>, users can subscribe to receive future products as well as placing orders to retrieve the product archive (massive order). You will be informed through e-mail whenever new products are ready on the FTP server to be downloaded.

Spatial Resolution 0.00892857142857 deg

Spatial Extent -180.00000000 180.00000000
-70.00000000

Temporal Extent From 1999-01-01 to 2016-12-31

Metadata

1



❖ Servicio Copernicus Land Global

Copernicus Global Land Service
Providing bio-geophysical products of global land surface

Vegetation Indicators - NDVI 300m V1

- NDVI 300m V1 (100 products)
- NDVI 1km V1 (3885 products)
- NDVI 1km V2 (952 products)
- VCI V1 (952 products)
- VPI V1 (952 products)

Basic

Date Slot

Range: 1 to 17

From year: 2014 To year: 2014

ROI

Advanced

Search Reset

Number of results per page 100

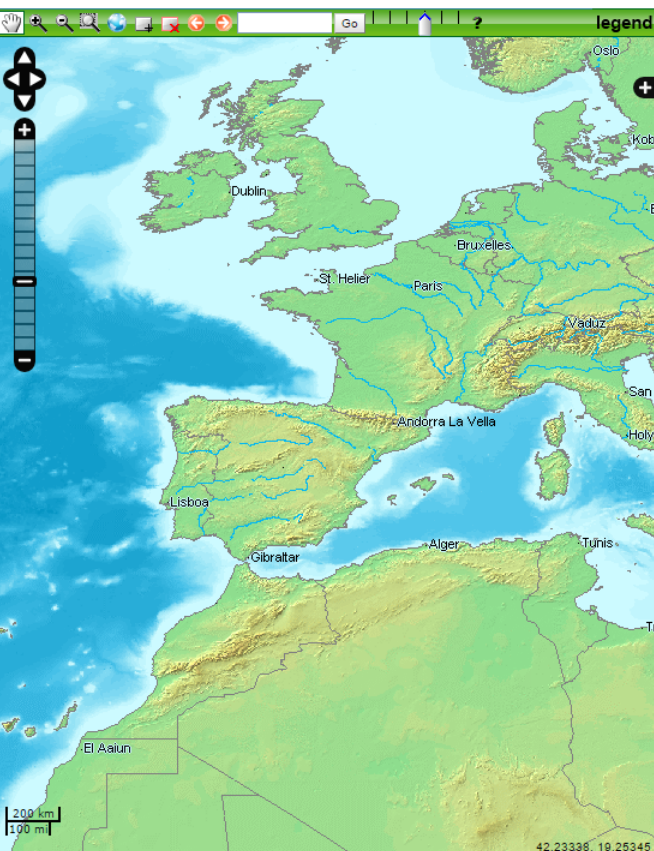
Version 2.1.14-20151019

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❖ Servicio Copernicus Land Global

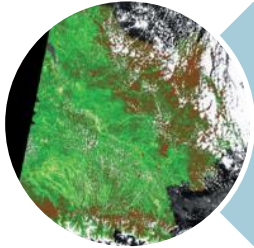


Vegetation Indicators - NDVI 300m V1
 0 products selected on a total of 29

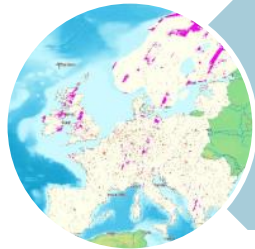
Select all 29 products

Download	Product ID	Start Date	End Date	Size	Thumbnail	Quicklook	Ingestion date
<input type="checkbox"/>	NDVI300_201410110000_GLOBE_PROBAV_V1.0	11/10/2014	20/10/2014	1 GB			27/04/2016
<input type="checkbox"/>	NDVI300_201410010000_GLOBE_PROBAV_V1.0	01/10/2014	10/10/2014	1 GB			27/04/2016
<input type="checkbox"/>	NDVI300_201409210000_GLOBE_PROBAV_V1.0	21/09/2014	30/09/2014	1.1 GB			27/04/2016
<input type="checkbox"/>	NDVI300_201409110000_GLOBE_PROBAV_V1.0	11/09/2014	20/09/2014	1.1 GB			27/04/2016
<input type="checkbox"/>	NDVI300_201409010000_GLOBE_PROBAV_V1.0	01/09/2014	10/09/2014	1.1 GB			27/04/2016
<input type="checkbox"/>	NDVI300_201408210000_GLOBE_PROBAV_V1.0	21/08/2014	31/08/2014	1.1 GB			27/04/2016
<input type="checkbox"/>	NDVI300_201408110000_GLOBE_PROBAV_V1.0	11/08/2014	20/08/2014	1.1 GB			27/04/2016
<input type="checkbox"/>	NDVI300_201408010000_GLOBE_PROBAV_V1.0	01/08/2014	10/08/2014	1.1 GB			27/04/2016
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<input type="checkbox"/>	NDVI300_201407110000_GLOBE_PROBAV_V1.0	11/07/2014	20/07/2014	1.1 GB			27/04/2016
<input type="checkbox"/>	NDVI300_201407010000_GLOBE_PROBAV_V1.0	01/07/2014	10/07/2014	1.1 GB			27/04/2016
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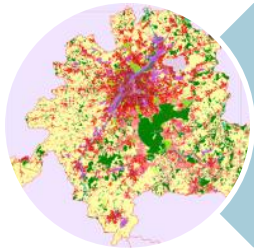




Global



Continental



Local

❖ Copernicus Land Pan- Europeo

Servicio continental

→ Corine Land Cover



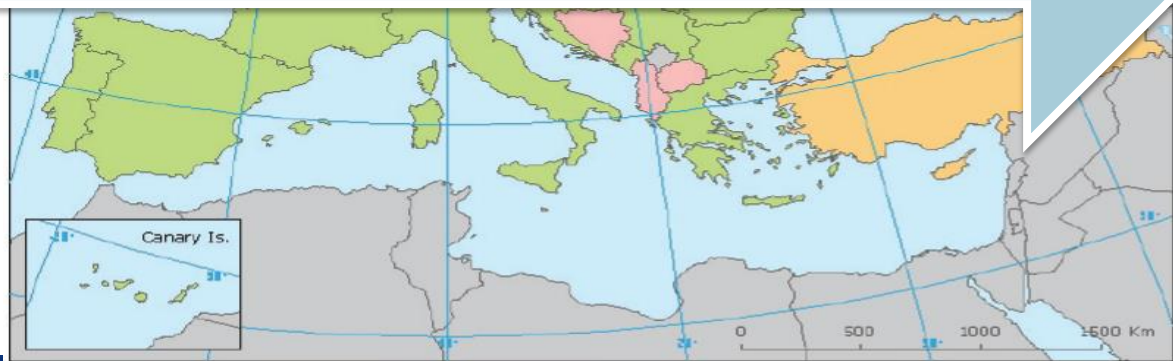
CLC 90

CLC 2000

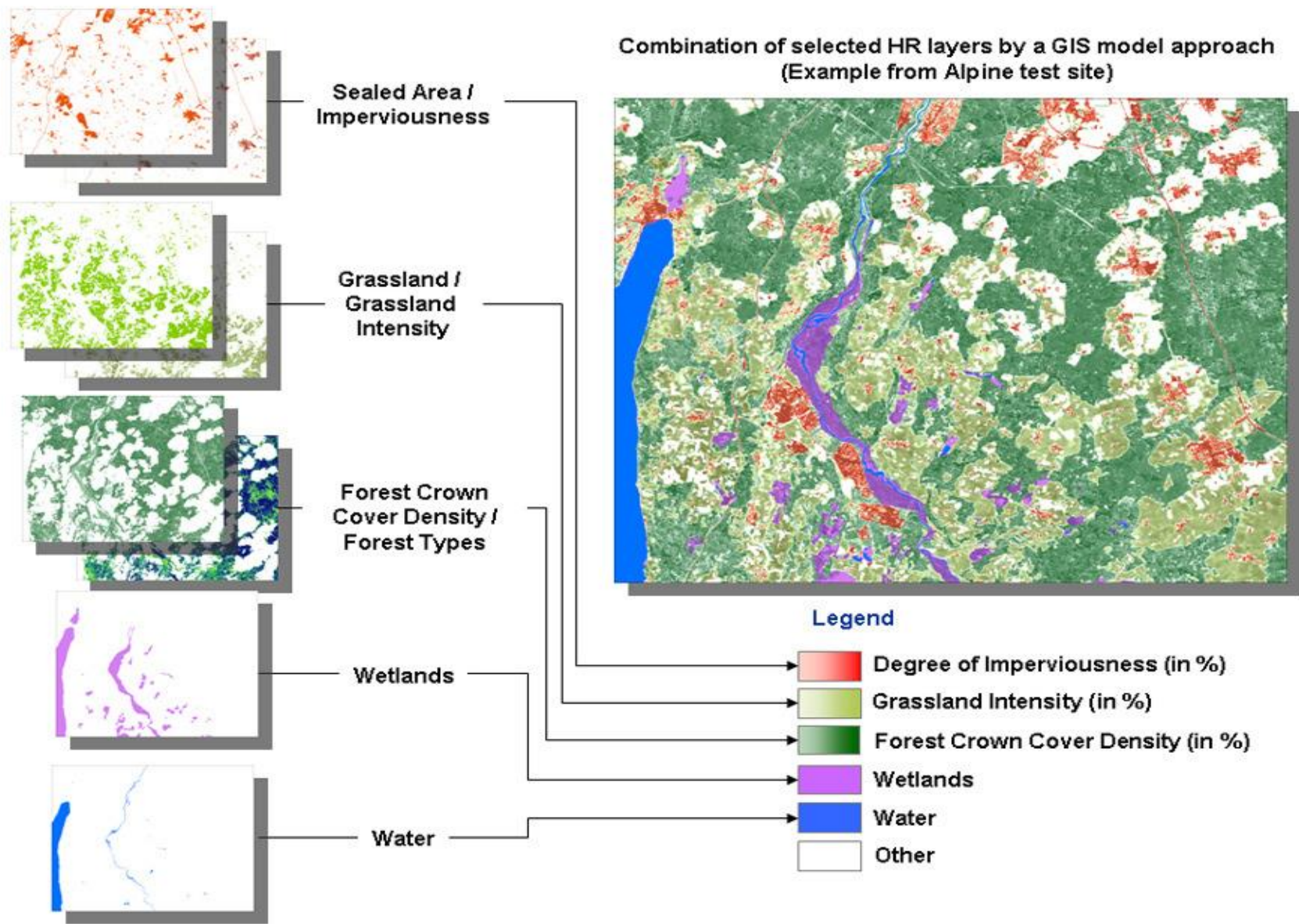
CLC 2006

CLC 2012

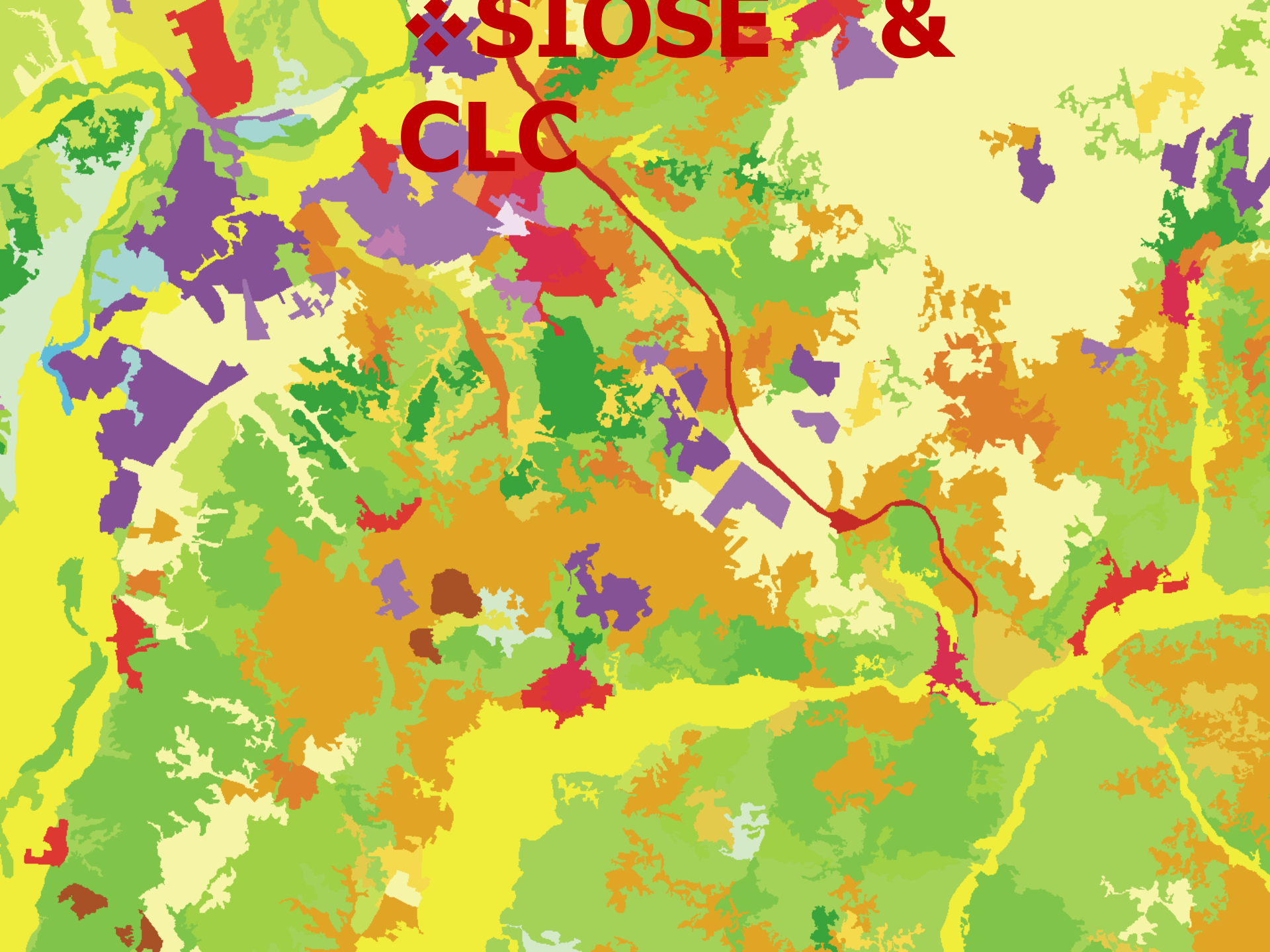
CLC 2018



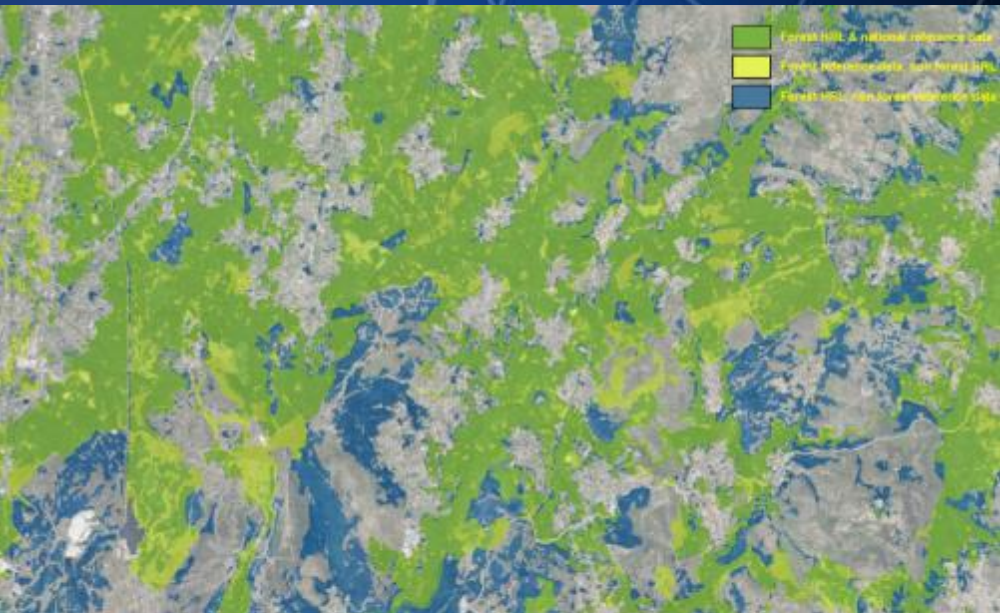
❖ Copernicus Land Pan- Europeo



SIOSE & CLC



■ HRL



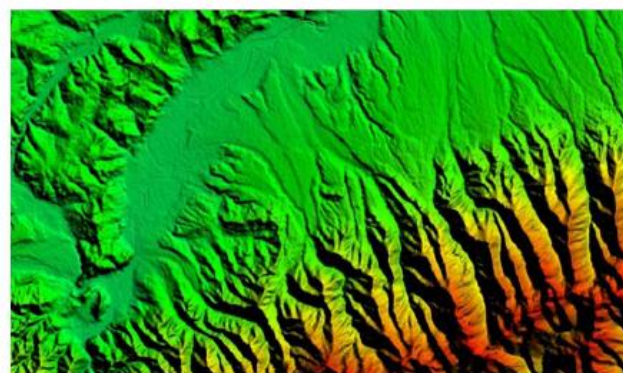
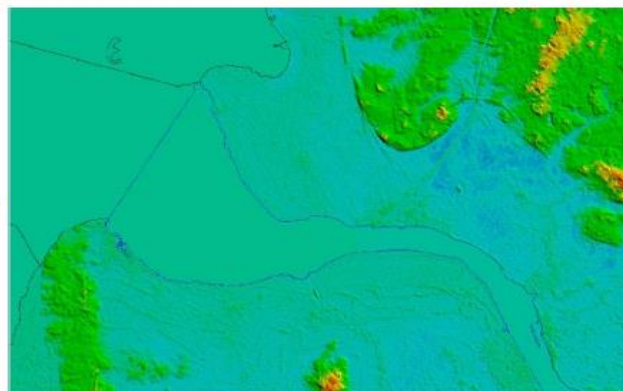
	Omission error	Comision error	National enhacement with
Forest density	4.5% ± 1.22	16.0% ± 1.72	MF50, MFE25, IFE, SIOSE
Forest type	13.2% ± 2.13	26.0% ± 2.14	MF50, MFE25, IFE, SIOSE
Grassland	20.4% ± 2.0	27.3% ± 2.6	SIOSE
Imperviousness	8.9% ± 1.64	9.2% ± 1.26	SIOSE, BTN100
Water	18.5% ± 2.13	32.0% ± 2.54	SIOSE, BTN100
Wetlands	51.2% ± 2.94	47.2% ± 2.97	SIOSE, BTN100



Servicio Copernicus Land (In Situ): EU – DEM 2015

EU-DEM 2015

- ★ Pixel resolution: 25 meters
- ★ Vertical accuracy of +/- 7 meters RMSE
- ★ Projection: LLAEA (EPSG:3035); ellipsoid GRS80, vert. datum EVRS2000 geoid EGG08
- ★ Source datasets: SRTM, ASTER GDEM and Russian topographic maps
- ★ Delivery format: GeoTIFF 32 bit, 100x100 km tiles
- ★ More than 75.000 artifacts detected and corrected
- ★ Consistency with the EU-HYDRO coastline
- ★ Burning EU-HYDRO water bodies into EU-DEM
- ★ QC: statistical analysis, removal of artifacts & ge-positioning errors, consistency with EU-HYDRO, completeness

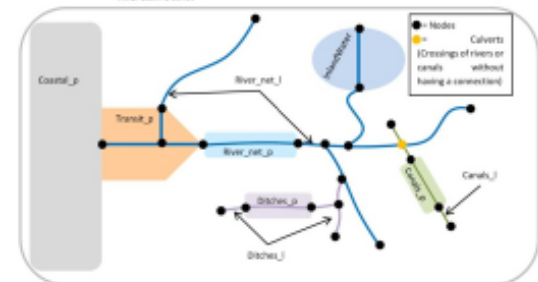
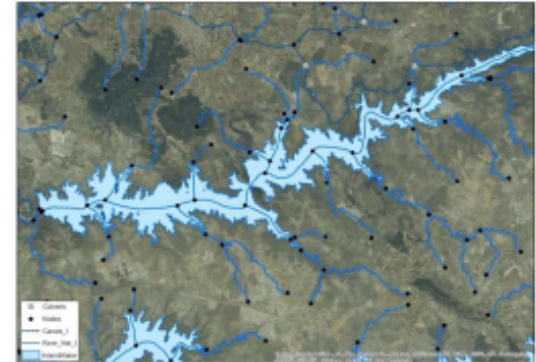


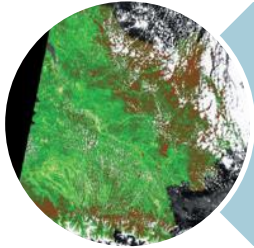
Servicio Copernicus Land (In Situ): EU – HYDRO 2015



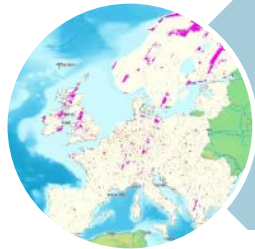
EU-HYDRO 2015

- ★ River Network scale: 1:50,000 and better
- ★ Projection: Lambert Azimuthal Equal-Area (EPSG:3035); geographic CRS – ETRS89
- ★ MMU: 1 ha: photo-interpretation VHR SPOT5/6 imagery (2.5 m res.), period 2011-2013
- ★ River network: rivers (l/p), inland water bodies (p), culverts (l), nodes, canals (l/p), ditches (l/p), transitional waters (p), coastal polygon (p), river basins (p)
- ★ QC: positional & thematic accuracy, topological consistency, completeness, INSPIRE conformity

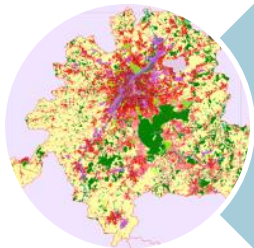




Global



Continental



Local

Servicio Land Local: Urban Atlas

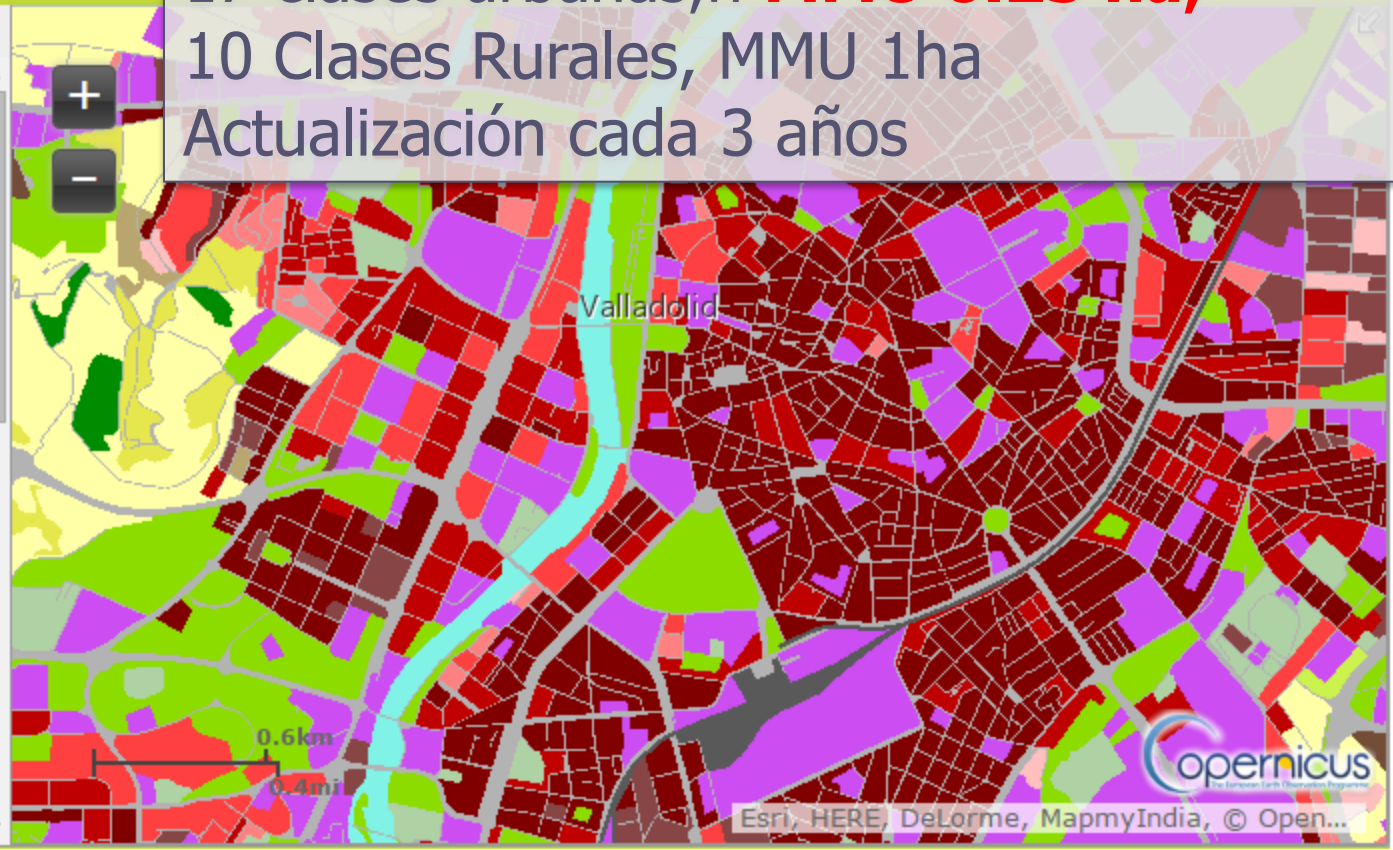
Urban Atlas 2012 Not yet validated.

Map View Metadata Download

Leyenda Web services

- Urban_Atlas_2012
- Land Use
- 11100: Continuous Urban fabric (S.L. > 80%)
 - 11210: Discontinuous Dense Urban Fabric (S.L.: 50% - 80%)
 - 11220: Discontinuous Medium Density Urban Fabric (S.L.: 30% - 50%)
 - 11230: Discontinuous Low Density Urban Fabric (S.L.: 10% - 30%)
 - 11240: Discontinuous very low density urban fabric (S.L. < 10%)
 - 11300: Isolated Structures
 - 12100: Industrial, commercial, public, military and private units
 - 12210: Fast transit roads and associated land
 - 12220: Other roads and associated land
 - 12230: Railways and

Ciudades EU28 (695) > 50.000 hab.
17 clases urbanas, **MMU 0.25 ha;**
10 Clases Rurales, MMU 1ha
Actualización cada 3 años



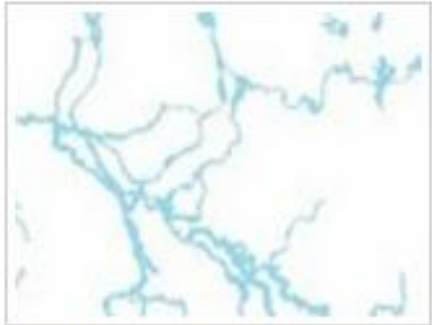
En España 145 ciudades, escalas 1:10K-1:25K



Riparian Zones



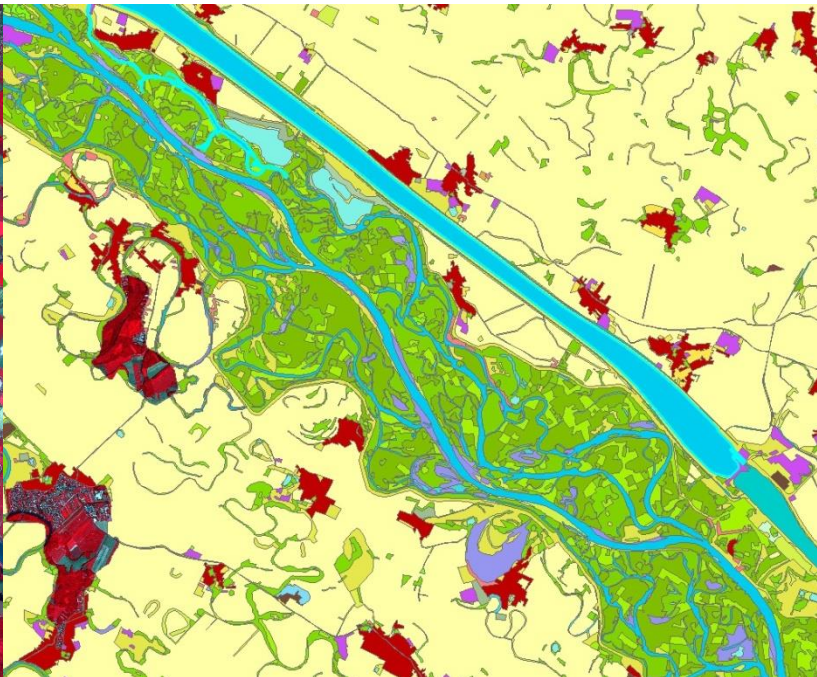
Land Cover/ Land Use
(0,5MMU)



Delineation of Riparian
Zones



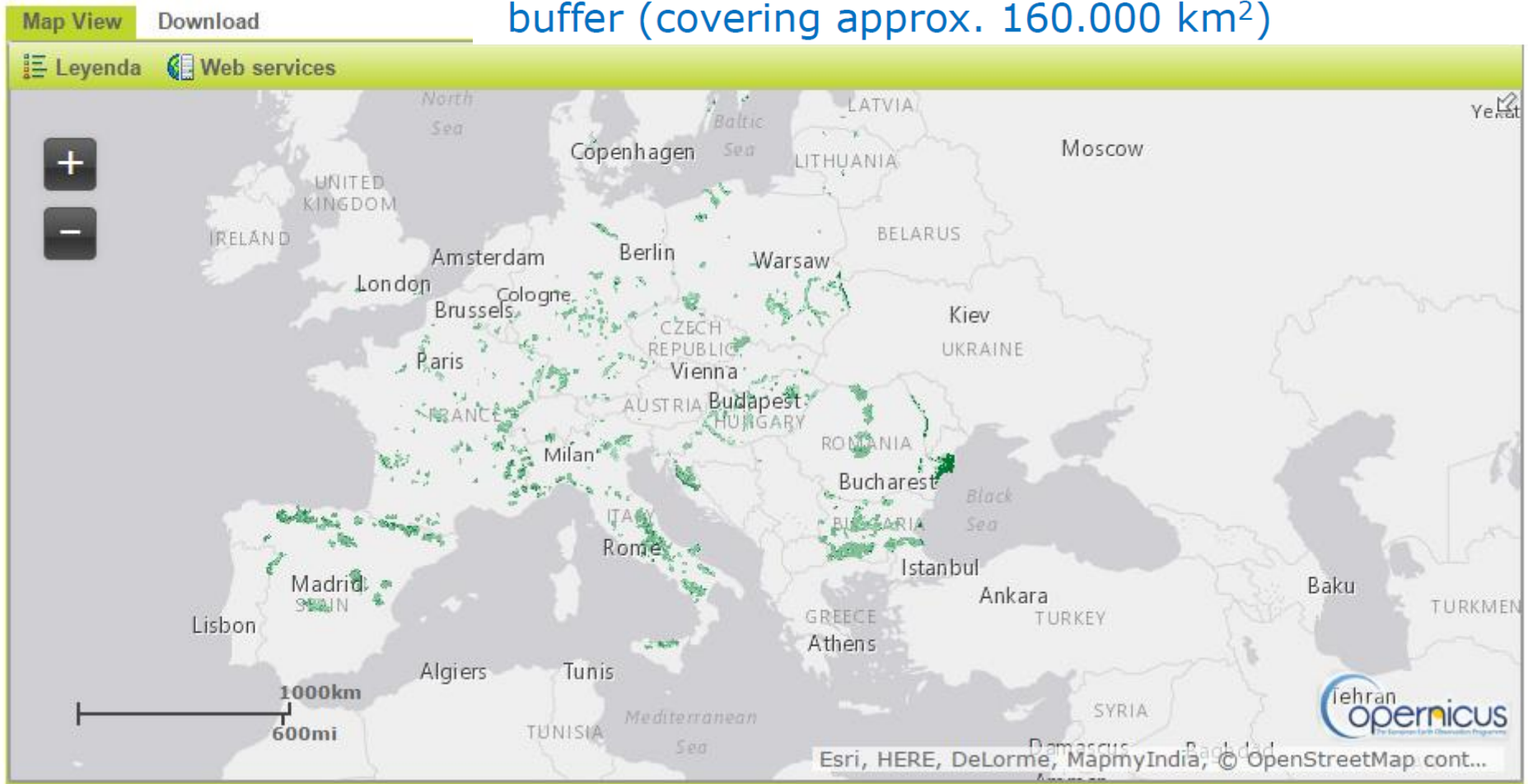
Green Linear Elements



❖ Servicio Land Local

N2K grassland-rich sites: 5 grassland habitats types 6210, 6240, 6250, 6510 and 6520, including a 2km buffer (covering approx. 160.000 km²)

Natura 2000 **Not yet validated.**



❖ Copernicus Land: evolución

- CLC & CLCC cada 6 años (2018) → EAGLE
- CLC extendido (Mediterráneo, Mar Negro)
- HRLs cada 3 años, en estudio incr. anuales
- Se mantienen las actuales (con mejoras)
- Continuidad del Urban Atlas: 2015, 2018
- Riparian zones 2012, 2018

Nuevas HRLs

- Green linear elements
- Improved grassland/ intensity of agricultural management

Servicio Local - nuevos elementos:

- Urban Atlas: 3ª dimensión
- Extensión según categorías Strahler
- Segunda serie Natura 2000
- Coastal zone monitoring (Cop. Marine Service, MS)
- Permanent snow & ice cover monitoring

Land Services (PNOT)

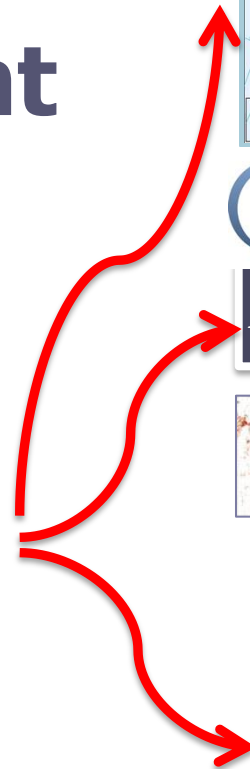
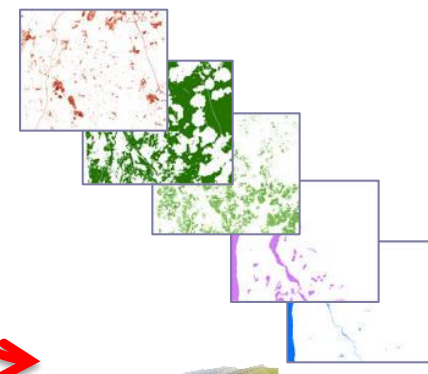


Continental & Local



Copernicus Land Framework Agreement

(CLC-HRL-Local components-CLC+) → 2017-2021



Actividades complementarias:

■ SIOSE Alta Resolución

- Información Geográfica de Referencia en Ocupación del Suelo
- Facilitará la convergencia del SIOSE con MFE e IGRs
- **Integración de información** procedente MFE - Foto Fija, LIDAR (vegetación y edificios), SIGPAC y Catastro.

■ Producción CLC Changes 12-18 →

- CLC 2018 = CLC 2012 + CLC Changes 12-18
- **Imagen 2011 → 2017 (PNOA+PNT+Copernicus)**
- **Cambios CLC 12-18 → SIOSE Cambios 11-14 + Detección de cambios SIOSE 14-17 (5ha)**

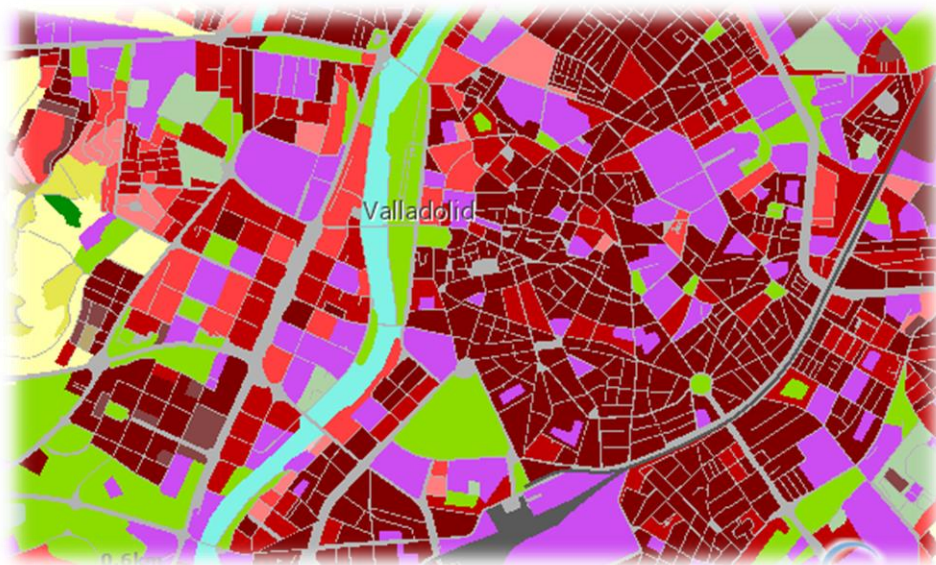
Calendario previsto MS por la EEA:

1. (crucial SOER2020): CLC2018 + CLC change: **2017**
→ Agosto 2018
2. Verificación Local Components 2012: 2017 (1er sem.)
3. Verificación of HRL2015 (IMD+TCD+FTY):
Sept. 2017 -Dic. 2017
4. Verification HRL2015 (grassland + wetness&water):
En. 2018 – Jul. 2018
5. Verificación HRL2015 (small woody features):
Sept.-Dic. 2018

Actuaciones en curso:

1. Urban Atlas:

- 0,25-1 ha, 3D?
- actualización 6(3?) años



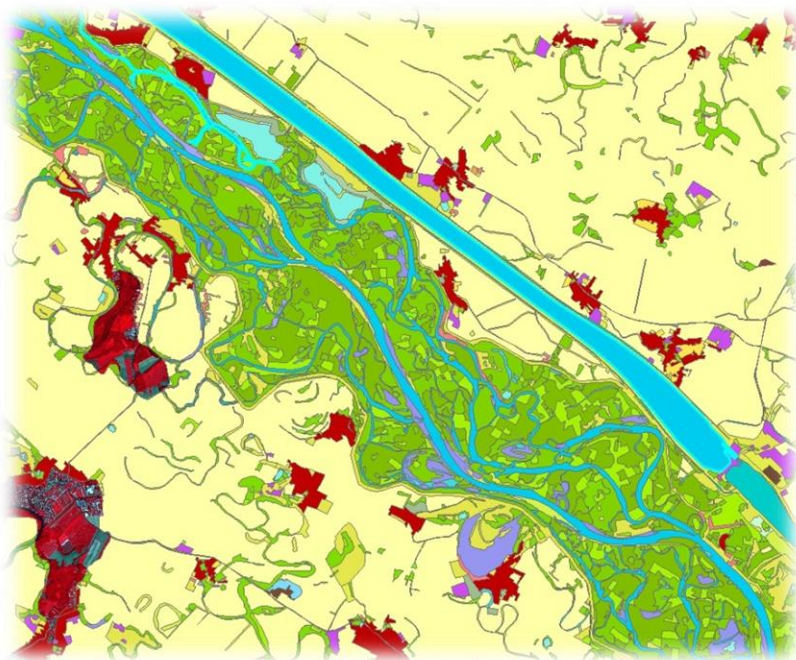
IGR:

- SIOSE
- Poblaciones
- MDE Edif.
- Cartociudad

Actuaciones en curso:

2. Riparian Zones:

- 0,5 ha, LC buffer 2km, Stralher 1 a 8, Green linear elements
- actualización 6 años



IGR:

- SIOSE
- IGR HI

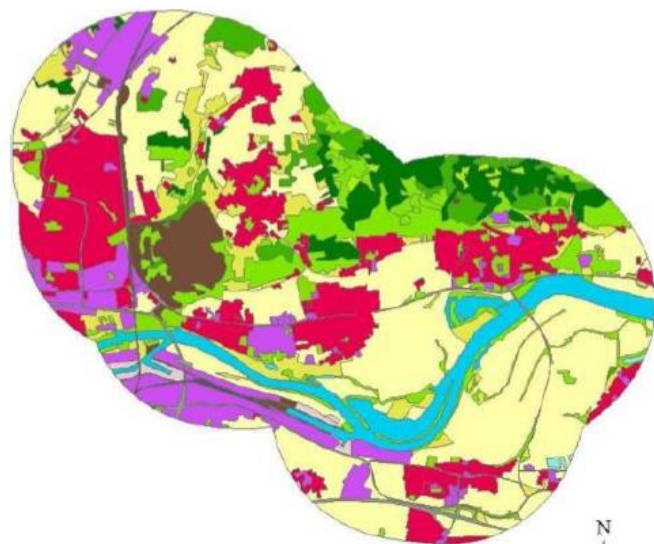


BDN (MFE)

Actuaciones en curso:

3.Natura 2000:

- 0,5 ha, categorías MAES 6210,6240,6250,6510, 6520
- Extension resto 6XXX, actualización 6(3?) años

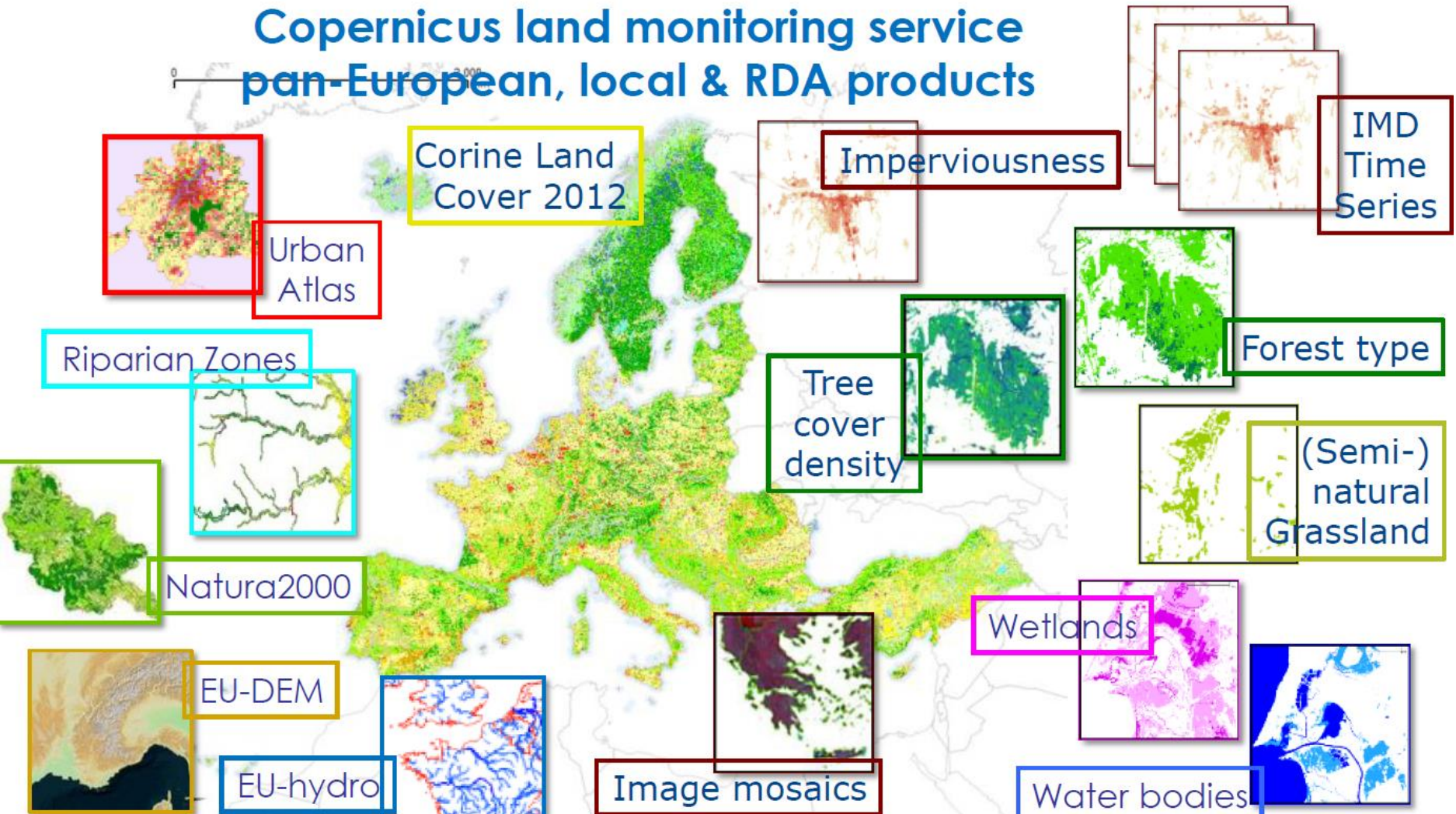


BDN:

- Red Natura 2000
- MFE

❖ Servicio Copernicus Land Pan- Europeo

Copernicus land monitoring service pan-European, local & RDA products



New Horizons for European and Copernicus land monitoring - Copernicus products and services ready to use, 19-20/10/2015, Copenhagen



Hans DUFOURMONT
Project manager Copernicus land monitoring services



❖ Copernicus Land PanEU+Local: calendario



**CLC+ HRL
UA+RZ+N2K**

**CLC+ HRL
UA+RZ+N2K**

2012

**HRL
2015**

2018

SOER 2020

SIOSE

2011

SIOSE

2014

SIOSE

2017



Resultados generales:

- Aprovechamiento datos Sentinel
- Continuidad de servicios
 - CLC 90-2000-2006-2012-2018*
 - HRLs : 2006-2009-2012-2015-2018
 - Urban Atlas, Riparian Zones, Natura2000
- Uso iniciativas y experiencias europeas y globales: INSPIRE, HELM, GEO GEOSS, EAGLE

Copernicus Land Pan-Europeo

- HRLS: 2015 y 2018
 - Imperviousness (inc. Cambio)
 - Forest
 - Grassy and non woody vegetation (mejora especificaciones prevista)
 - Wetness and Water bodies (unidos)
 - New: small woody features (green linear elements)
- New: phenology product
- EU-DEM & EU HYDRO
- CLC 2018: producción finalizada en octubre 2018 → SOER

Copernicus Land Local

- Servicios locales existentes
 - Urban Atlas (+3ª dimensión*), fecha 2012, extensión a 39 países.
 - Riparian Zones: extensión Strahler 1-2, LC
 - Natura2000 sites: focalizado en grassland, extensión a resto categorías de la directiva Habitats nº 6 (Natural and semi-natural grassland formations)
- New: Coastal Zone LC/LU monitoring, con especial atención a habitats sensibles
- New: Snow & Ice monitoring service

❖ Servicio Land: evolución 2015-2018

- Cooperación con MS: CLC, verificación (Pan+Local)
- HRLs+Local: basado en industria
- Timeliness!: entrega en tiempo y forma → incremento
 - rediseño flujo producción
 - Acortamiento plazos entrega
 - Automatización
- Entorno productivo para 2015 y 2018 en el marco temporal de 2016-2020

Cuestiones pendientes NRC Meeting:

- Implicación MS
 - Ajuste plazos producción CLC: Framework contract and specific contracts EEA
 - EAGLE & CLC (post 2018): open call CLC+ & Eagle
 - Verificación por países?
 - Uso de datos nacionales?
 - Formalización acuerdos
- Uso datos Sentinel

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