



GOBIERNO
DE ESPAÑA

MINISTERIO
DE TRANSPORTES
Y MOVILIDAD SOSTENIBLE

SIOSE

National Land Cover and Land Use Information System

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SIOSE



- Information system on Land Cover and Land Use for complete country, **providing official data for all thematic domains** (artificial, crops, natural, etc.) satisfying user needs from national, sub-national and international applications, saving efforts and costs
- Binding context
 - Regulation EU 2021/696 establishing the Union Space Program and the European Union Agency for the Space Program. **Copernicus Land Monitoring Service (CLMS)**
 - Regulation CE 1210/90 and 41/2009 on the European Environment Agency and the European Environment Information and Observation Network. IGN-ES contact point for 'Support to CLMS'
 - **INSPIRE Directive 2007/2/CE and National LISIGE Law 14/2010** establishing an Infrastructure for Spatial Information in the European Community.
 - **National Royal Decree 208/2022 organic structure Ministry. IGN-ES competencies.**
 - Directive 2019/1024 and National Royal Decree 24/2021 regarding open data and re-use of public sector information

- Geographic reference information for LCLU
- Cooperative and decentralized Project between national and sub-national public administrations



- Data source for international initiatives



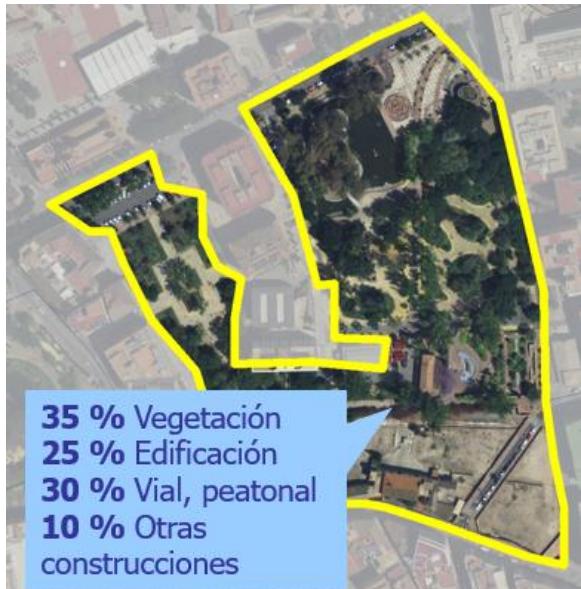
Land monitoring programs in Spain

- **IGN Spain. Ministry of Transport and Sustainable Mobility.**
 - National Plan for Earth Observation & Copernicus
<https://www.ign.es/web/ign/portal/obs-area-observacion-territorio#gsc.tab=0>
 - National Plan for Remote Sensing
 - National Plan for Ortho-photogrammetry and Lidar
 - **SIOSE**
 - INSPIRE reporting
 - UN-GGIM
- **Ministry for the Ecological Transition and the Demographic Challenge**
 - Environmental reporting: EIONET & EEA
 - Forest, Biodiversity and natural heritage
 - LULUCF
 - ...
- **DG Cadastre and sub-national cadastres**
- **Ministry of Agriculture, Fisheries and Food**
 - LPIS & GSAA. Common Agricultural Policy.
- **Spanish Space Agency & Copernicus**



Technical characteristics

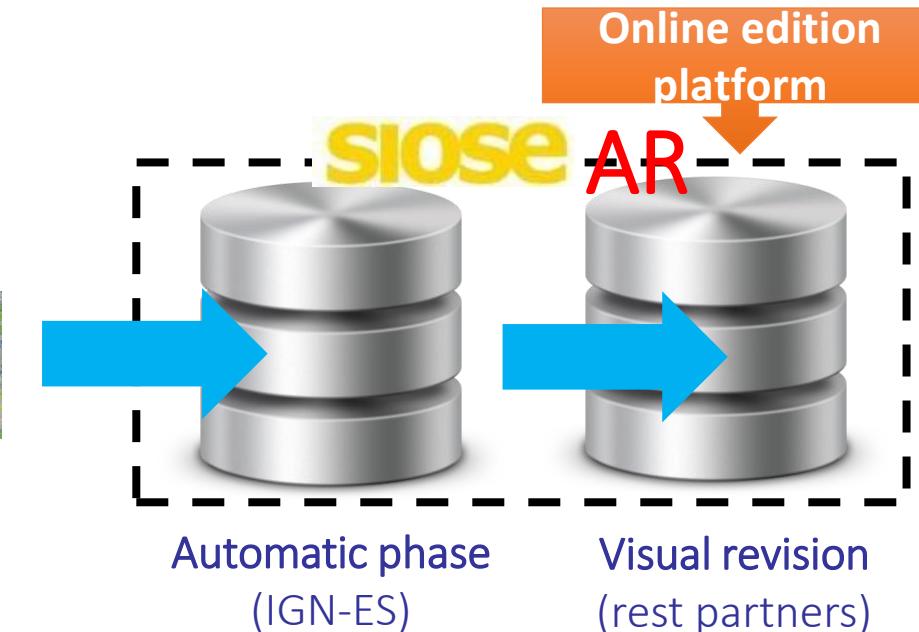
- GIS vector (only polygons allowed) for all national territory. Versions 2005, 2009, 2011 and 2014 (scale 1:25.000 MMU 2-0.5 ha). **High Resolution versions** 2014, 2017, 2020 under production (scale 1:5.000) looking for higher level of detail in geometry, thematic content and temporal aspects, promoting the use of open and official data
- Based on **re-use and reference official information integration from National and sub-national public administrations**: Cadastre, LPIS, GSAA from CAP, National Forest Map, national LiDAR coverages, National Topographic Database and data from sub-national administrations

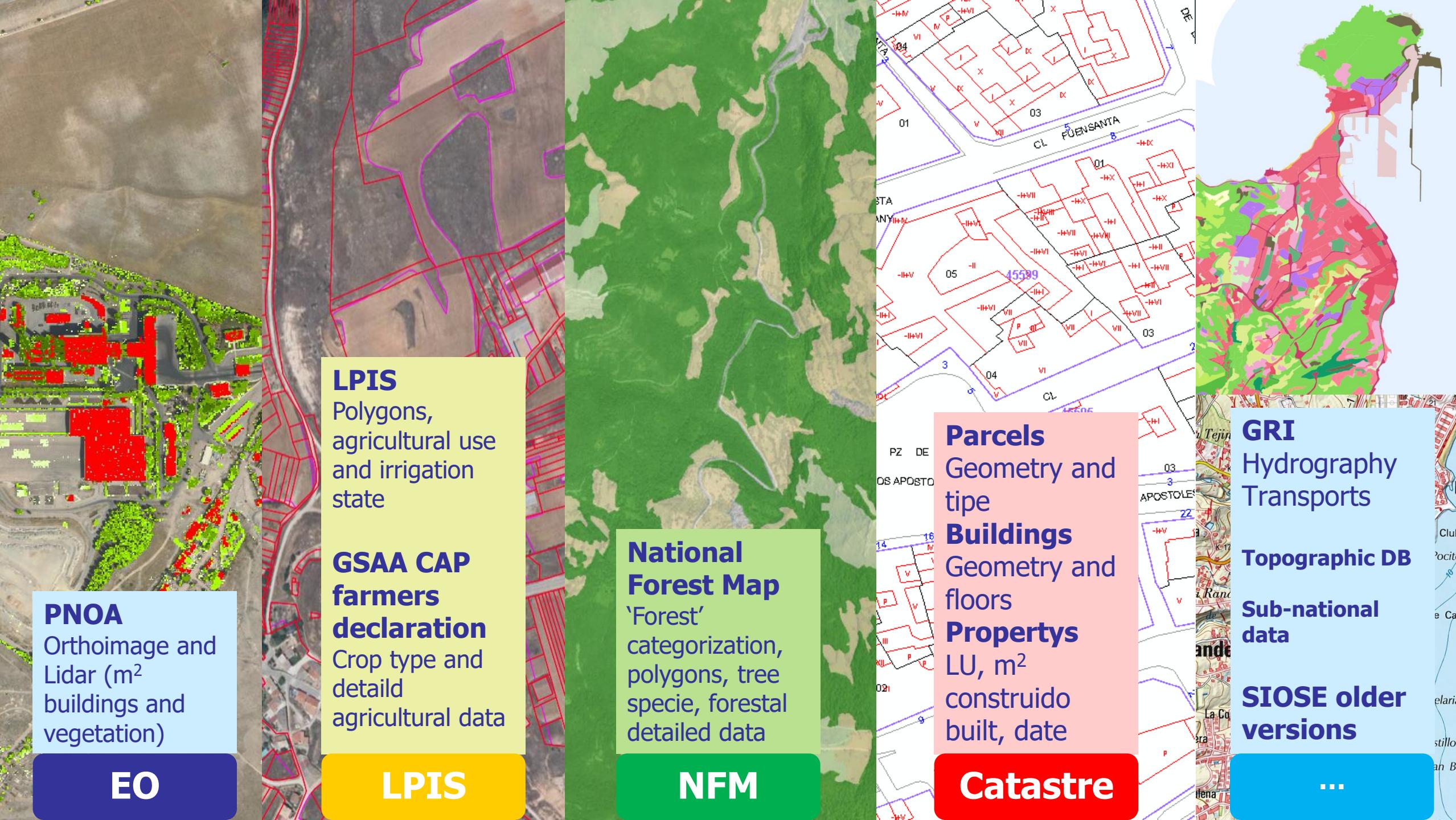


- **Object oriented data model**
- Automatic processing helps to get objectivity, cost saving, higher update frequency + complemented by visual revision of selected areas/topics



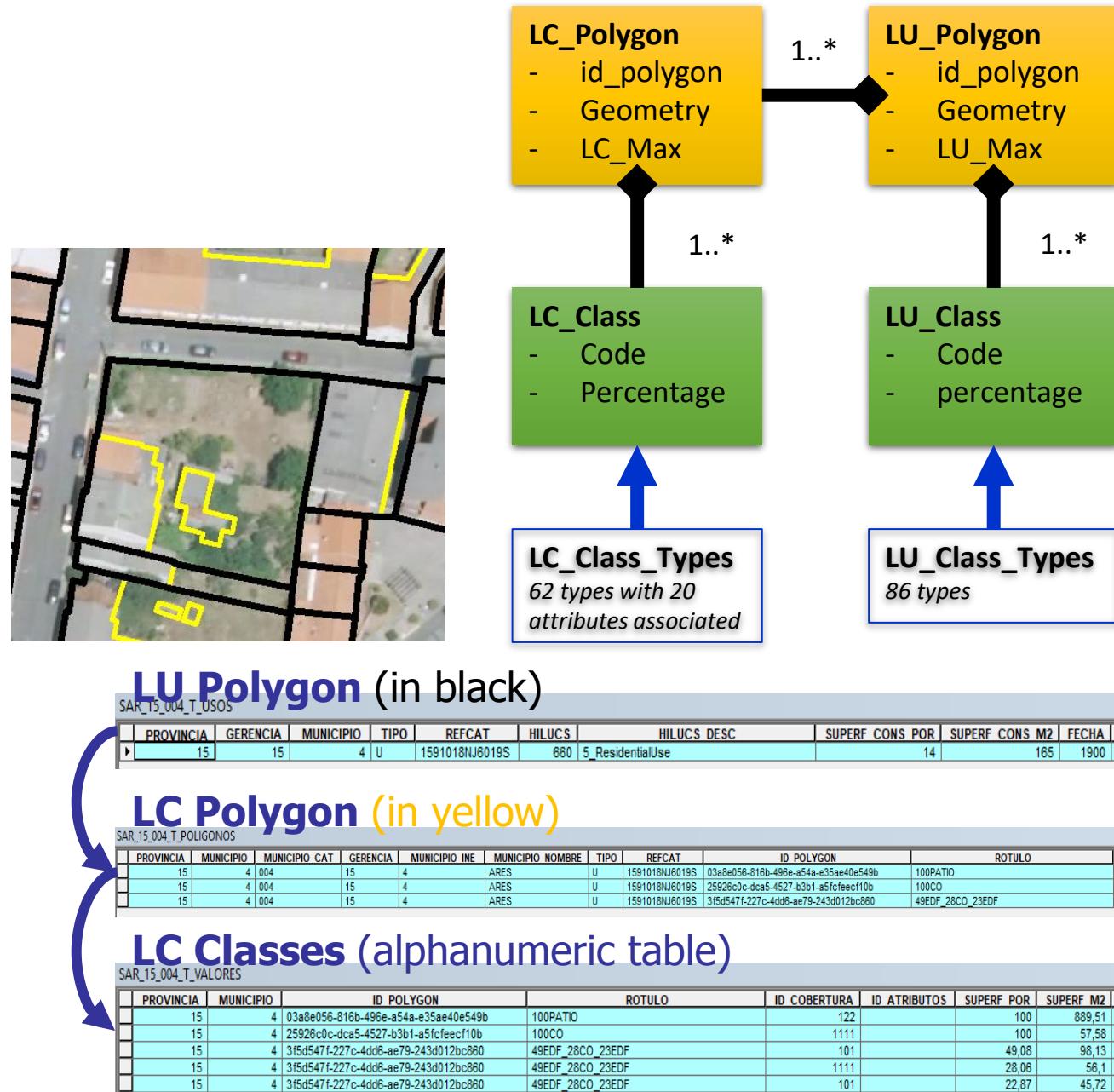
Data sources

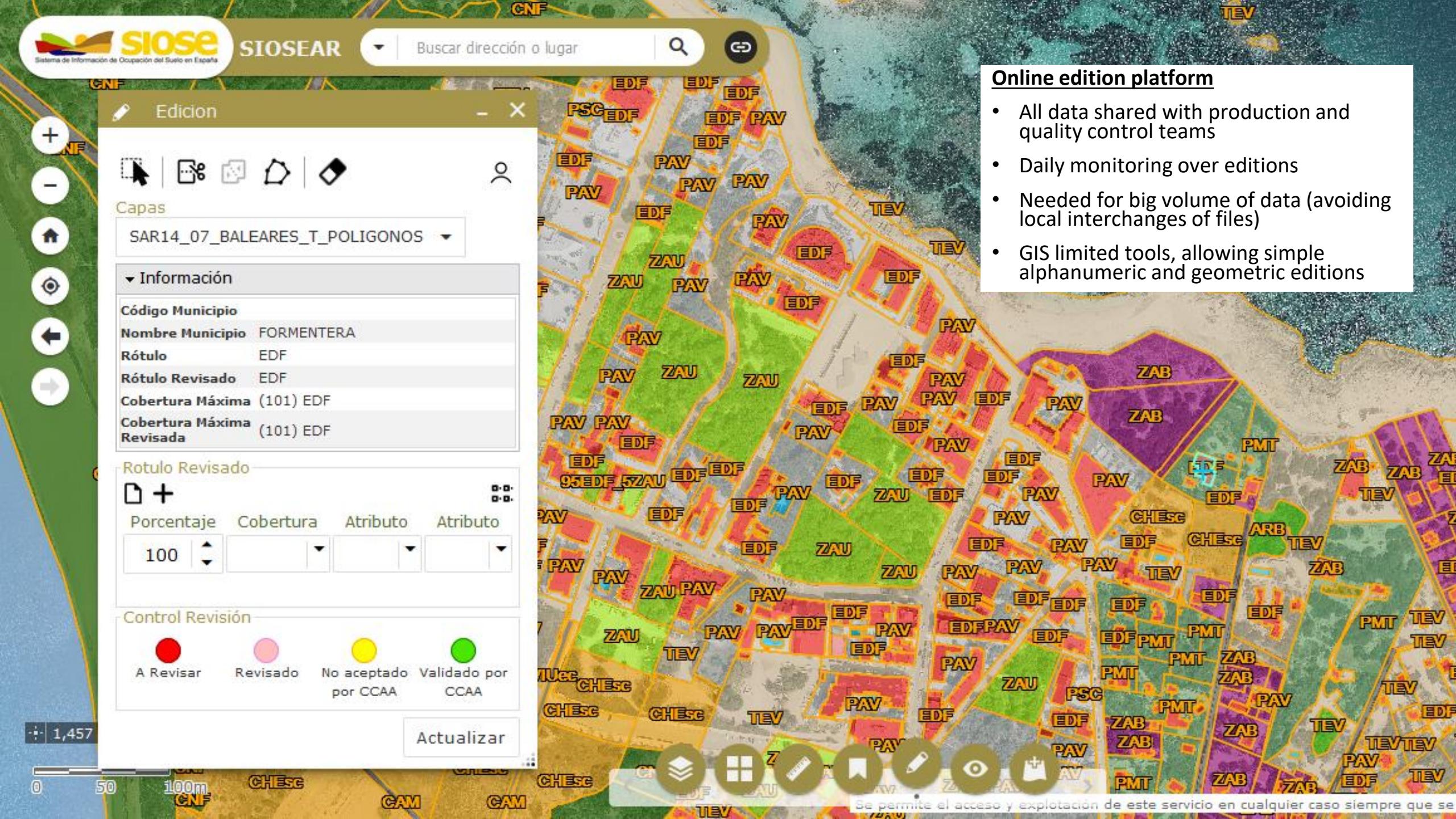




Data model

- Since 2005: **SIOSE data model** considers classes of LC or LU as objects to be associated to geometries by a %. LC classes allow additional parametrization by attributes
- 2010-2013: Contribution to **INSPIRE Data Specification on LC and LU**
- Since ~2008: Participation on **EAGLE Group** a assistance to CLMS products
- Since 2020: Participation in the **ISO TC/211**, WG 7 and projects for ISO 19144-X on LCLU

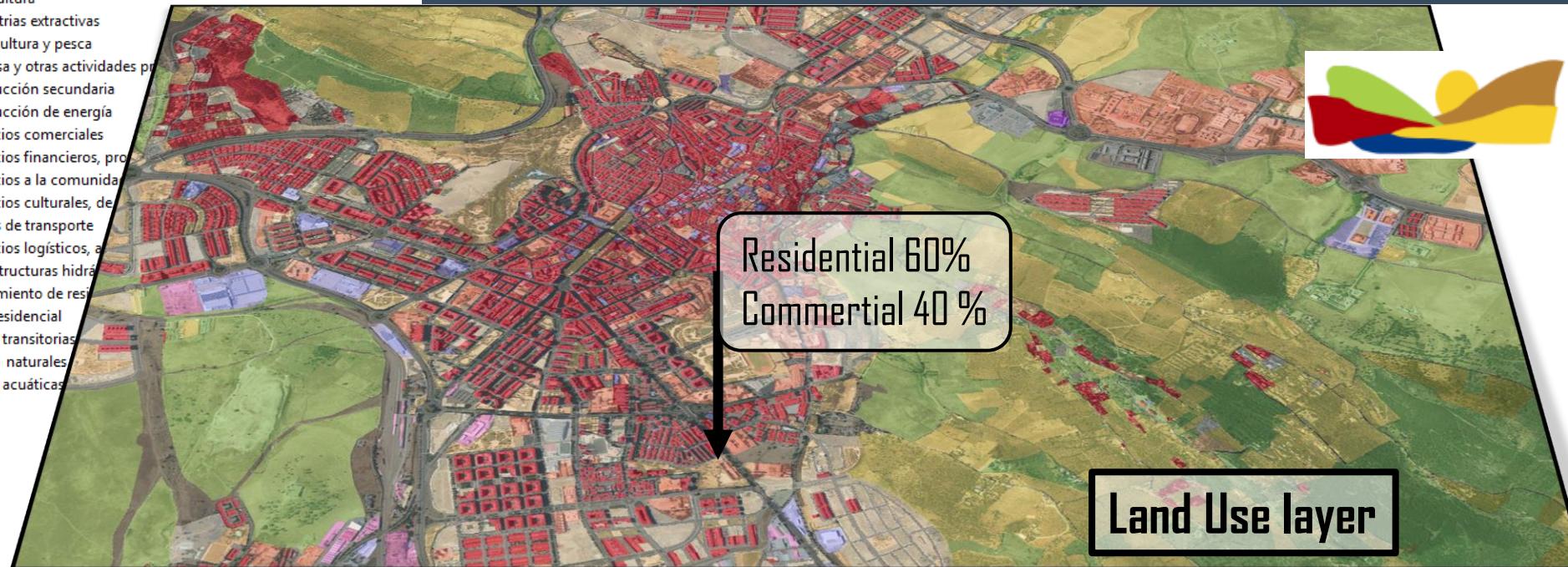




Online edition platform

- All data shared with production and quality control teams
- Daily monitoring over editions
- Needed for big volume of data (avoiding local interchanges of files)
- GIS limited tools, allowing simple alphanumeric and geometric editions

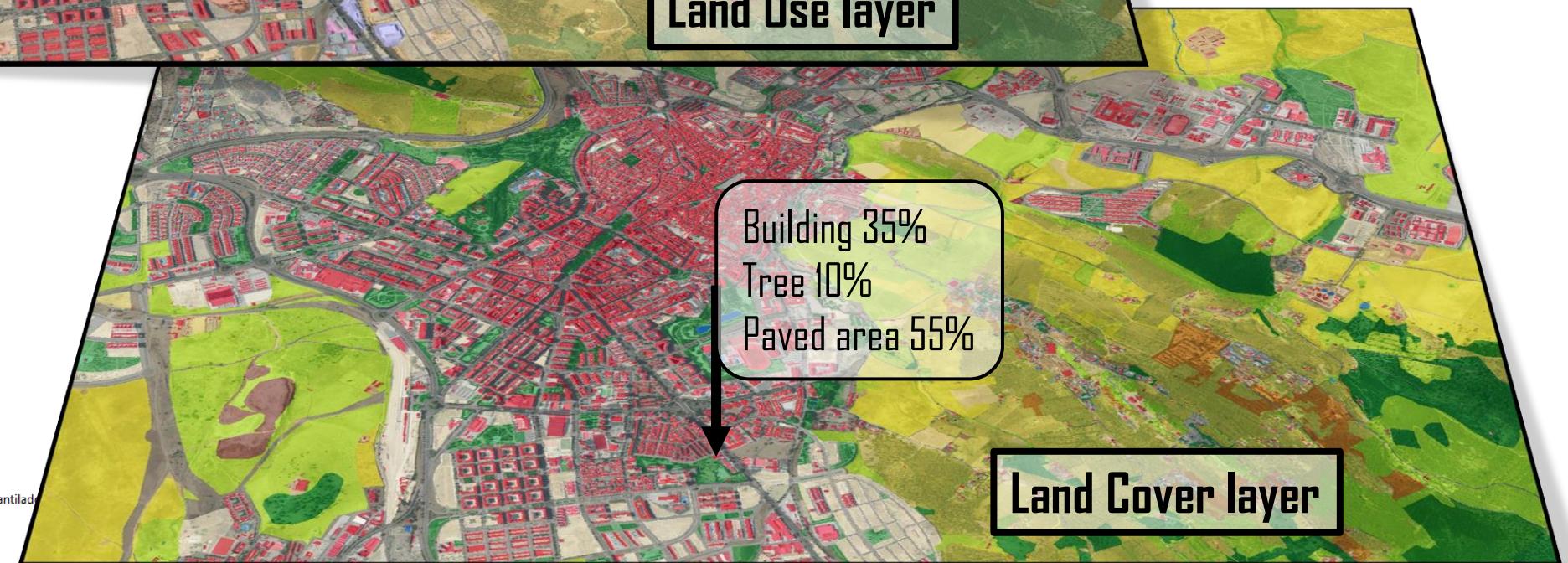
- Producción e infraestructuras agrícolas
- Silvicultura
- Industrias extractivas
- Acuicultura y pesca
- Dehesa y otras actividades pr
- Producción secundaria
- Producción de energía
- Servicios comerciales
- Servicios financieros, pro
- Servicios a la comunidad
- Servicios culturales, de
- Redes de transporte
- Servicios logísticos, a
- Infraestructuras hidrá
- Tratamiento de resi
- Uso residencial
- Áreas transitorias
- Áreas naturales
- Áreas acuáticas



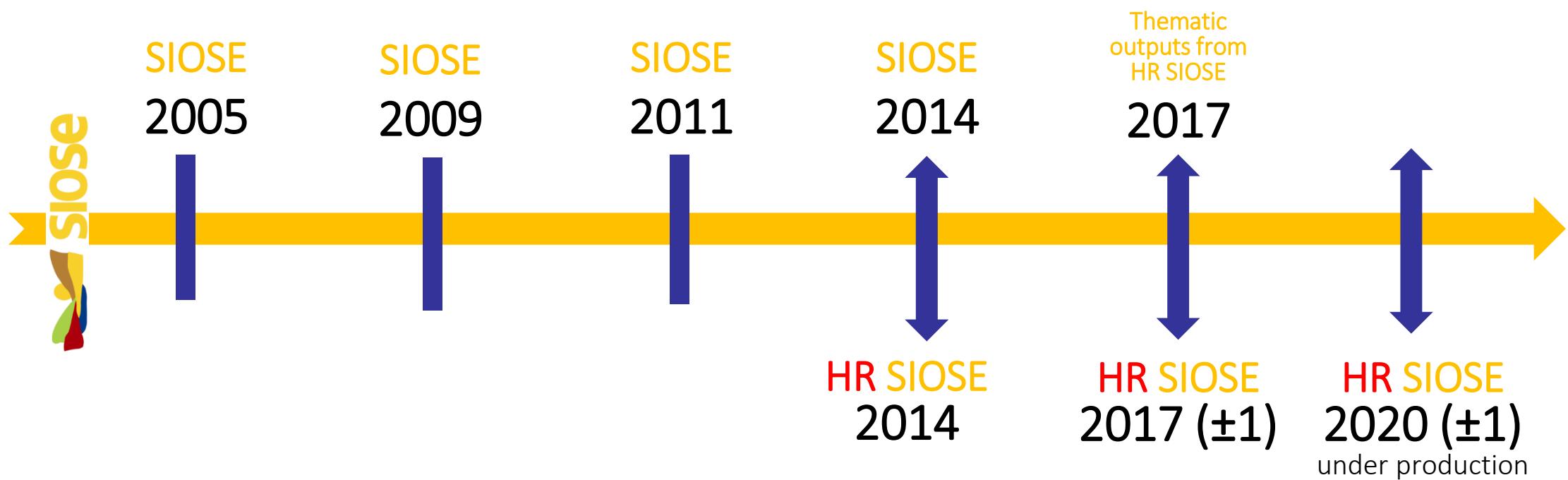
SIOSE

T_POLIGONOS	99.238.833
T_VALORES	129.904.412
T_USOS	<u>54.418.639</u>
283.561.884	

- Edificación y otras construcciones
- Zona verde artificial y arbolado urbano
- Zonas pavimentadas
- Piscinas, balsas y estanques
- Construcción deportiva
- Suelo no edificado
- Zona abierta
- Zonas de extracción y vertido
- Red de transporte terrestre
- Cultivos y cultivos herbáceos
- Frutales y asociaciones
- Viñedo y asociaciones
- Olivar y asociaciones
- Otros cultivos permanentes
- Huerta
- Prados
- Pastizal y pastizal-matorral
- Arbolado y pasto arbolado
- Frondosas
- Coníferas
- Matorral
- Terrenos con escasa o nula vegetación y acantilados
- Playas, dunas y arenas
- Glaciares, nieves permanentes
- Coladas lávicas
- Coberturas húmedas, marismas
- Turberas
- Salinas
- Cursos de agua, lagos, lagunas, embalses y canales



Versions

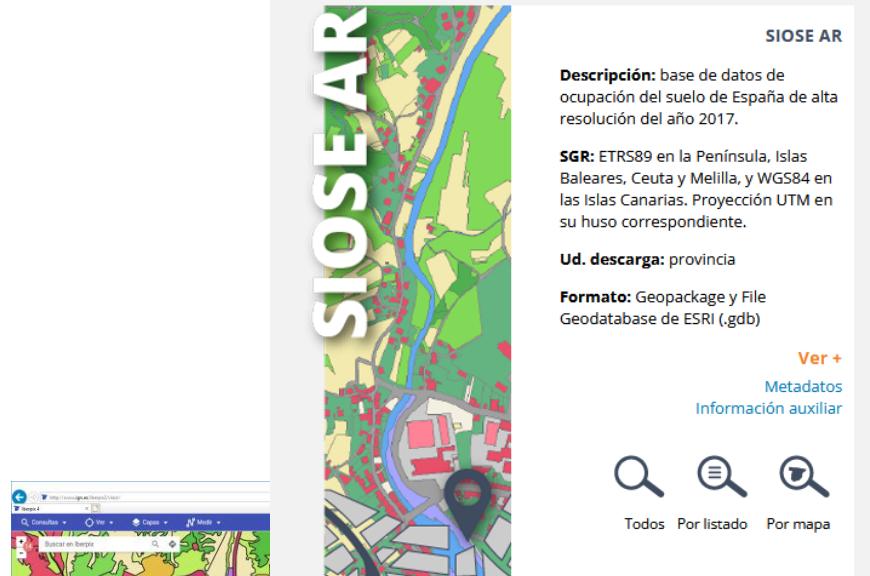


ta que abarca datos topográficos y temáticos, concebidos para su explotación m
ta (SIG) y capaces de servir de soporte tanto a consultas geográficas, como a la gene

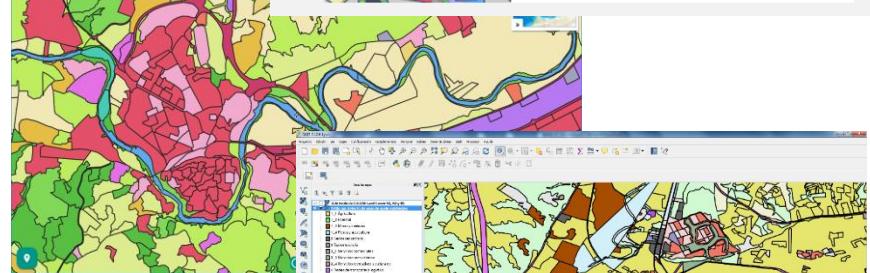
Dissemination

- **Web SIOSE (www.siose.es)**
- **Download center:** SIOSE 2005, 2009, 2011, 2014 y **SIOSE AR 2017 (2014 prior solicitud)** Licence: CC-BY
<https://centrodedescargas.cnig.es/CentroDescargas/index.jsp>
- **Webservices** (not HR SIOSE for the moment)
 - WMS (WMPS) y WFS INSPIRE last versions of SIOSE and CLC
 - WMS OGC older versions of SIOSE y CLC
- **Iberpix: generic IGN-ES viewer**
- **Own SIOSE portal with advanced exploitation queries**
- Teaching courses for technician
- Story Map about history of LCLU in Spain

<https://ign-esp.maps.arcgis.com/apps/MapSeries/index.html?appid=ba26e12cbd14476e9e2acd213bcfe26>



The screenshot shows the 'SIOSE AR' section of the download center. It features a large map preview of a rural area with various land use categories. To the right, there's a detailed description of the dataset, including its resolution (ETRS89 in the Peninsula, Balearic Islands, Ceuta, and Melilla; WGS84 in the Canary Islands), projection (UTM), and year (2017). Below the description are sections for download details (provincia), file format (Geopackage and File Geodatabase .gdb), and auxiliary information. At the bottom, there are search filters for 'Todos', 'Por listado', and 'Por mapa'.



The screenshot shows a map from the Iberpix viewer, displaying a city area with a mix of urban and rural land use categories. A legend on the left identifies the different colors used for land types.



The screenshot shows the own SIOSE portal. It includes a map view, a legend for land use categories, and a detailed text box explaining the SIOSE system, its purpose (generating a database of soil occupation data for the National Observatory of the Territory), and its scope (covering the entire country and integrating information from all autonomous communities and the General Administration).



Estadísticas

SIOSE

Año: 2005 - 2014

CCAA: Extremadura - Extremadura

Provincia: Badajoz - Badajoz

Municipio: Badajoz - Badajoz

Ver estadísticas

Descargar datos estadísticos en CSV

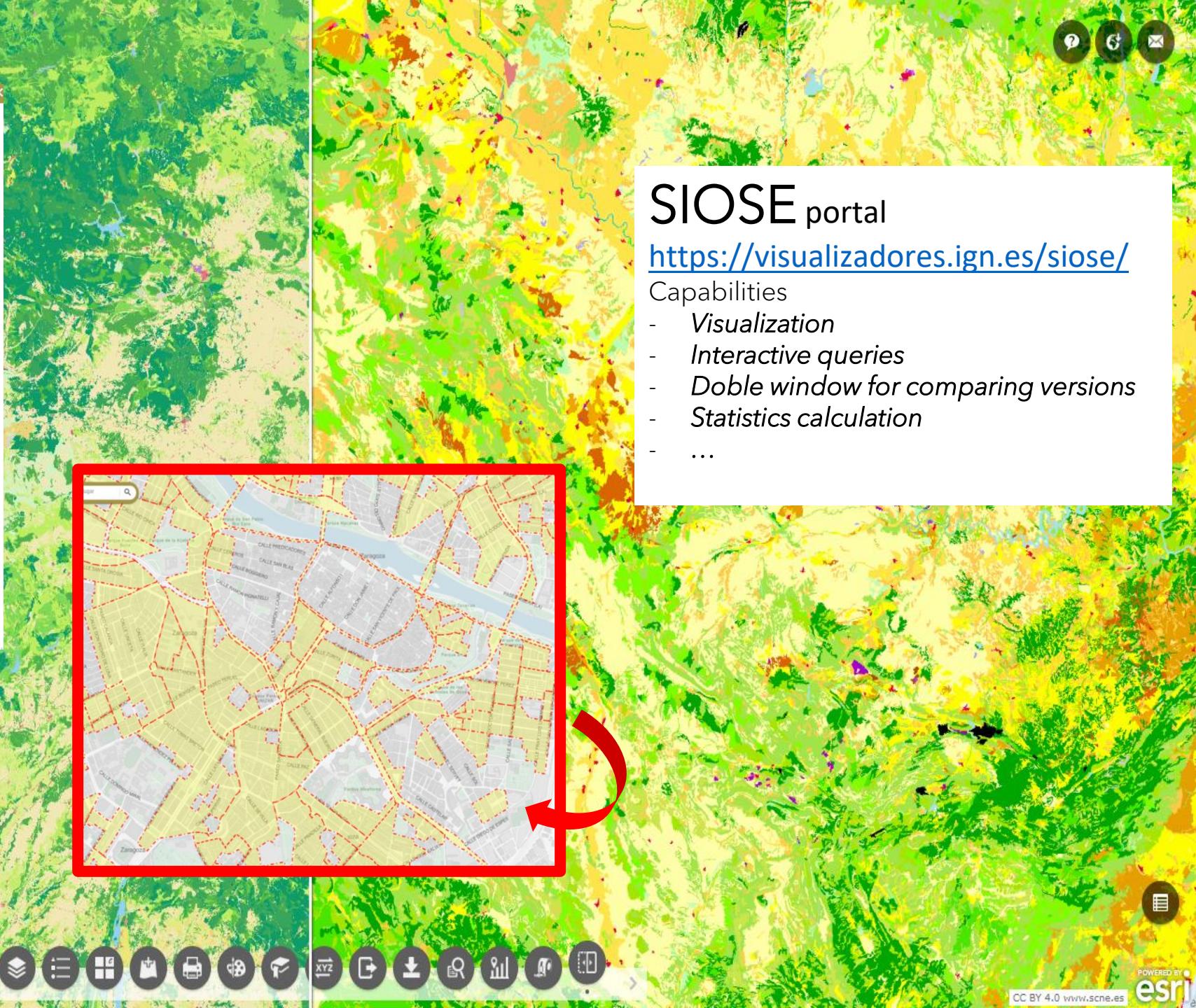
Badajoz (2005) - Badajoz (2014) SIOSE

Categoría	2005 (Hectáreas)	2014 (Hectáreas)
Aeroportuario	~100	~100
Edificación	~1400	~1500
Zona verde artificial y arbolado urbano	~450	~500

Hectáreas

Legend:

- Aeroportuario
- Edificación
- Zona verde artificial y arbolado urbano
- Eléctrica
- Depuradoras y potabilizadoras
- Lámina de agua artificial
- Vial, aparcamiento o zona peatonal sin vegetación
- Otras construcciones



SIOSE portal

<https://visualizadores.ign.es/siose/>

Capabilities

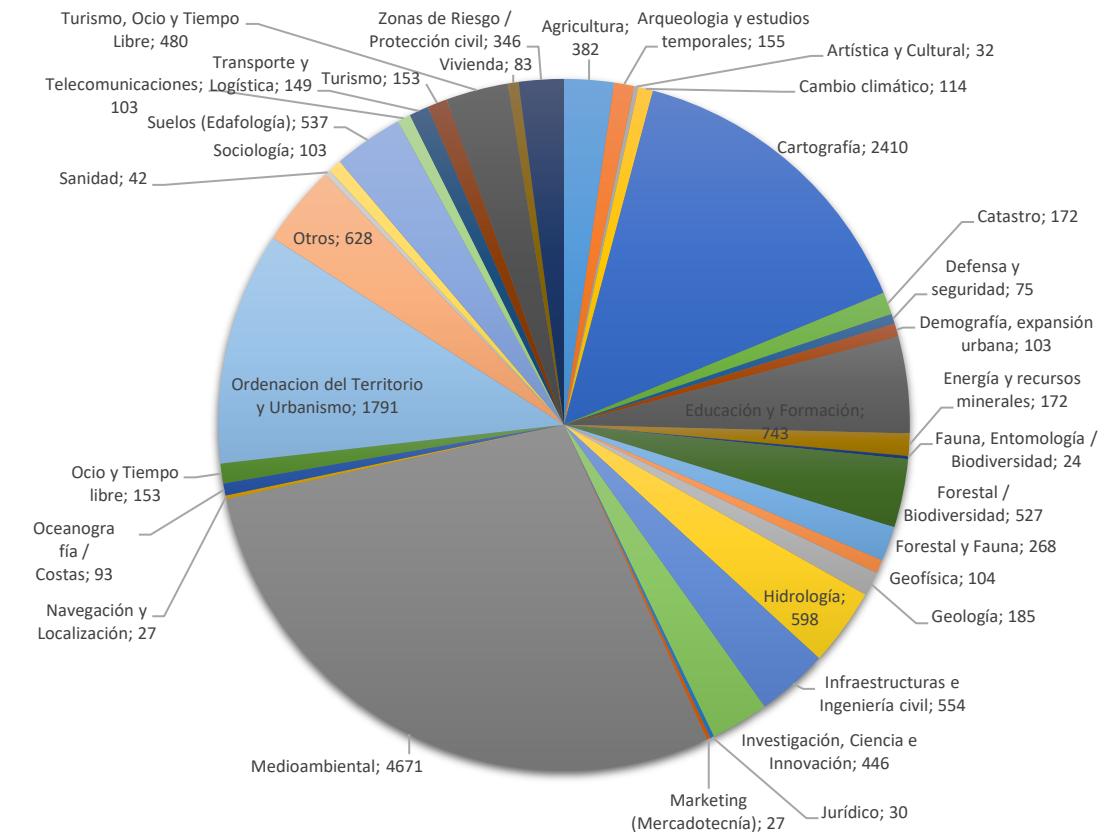
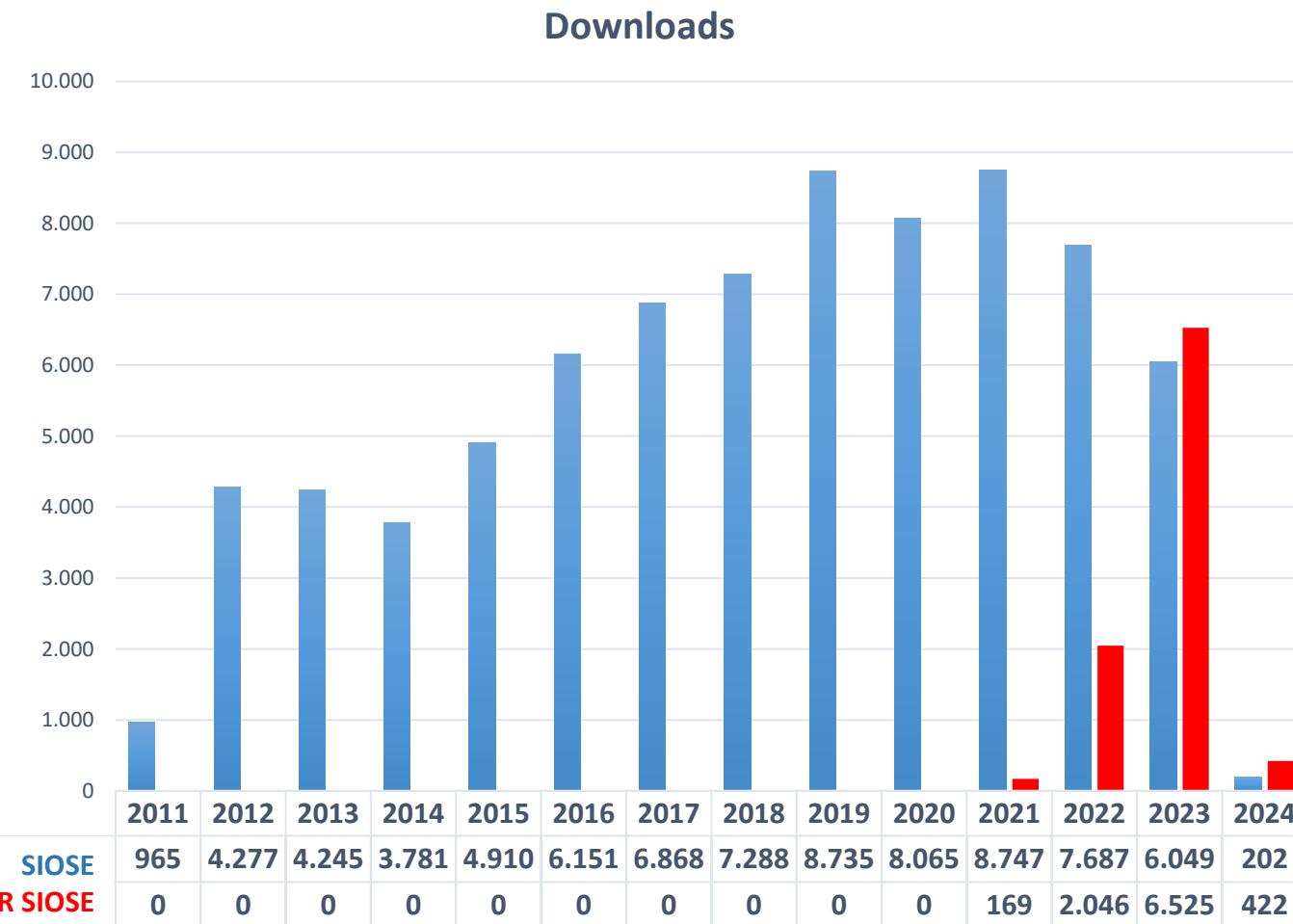
- Visualization
- Interactive queries
- Doble window for comparing versions
- Statistics calculation
- ...

Users

- **IGN-ES**
 - EO (remote sensing, photogrammetry)
 - GRI (Settlements, Hydrography, Transport Networks)
 - Cartography (National Maps 1:25.000 and 1:50.000)
 - National Atlas
- **CNIG** (Web services)
- **Environment Ministry** (Biodiversity, Forest, Water, Climate Change, Depopulation)
- **Housing Ministry**
- **Science Ministry** (Geology, Researches)
- **Inner Affairs Ministry** (Civil Protection)
- **National Statistic Institute**
- **CAP**
- **Cadastre**
- **Sub-national administrations**
- **Local entities** (city halls)
- **Private sector**
- **Universities & research centers**
- **European Union.** (INSPIRE. Copernicus Land Monitoring Service. Copernicus Emergency)

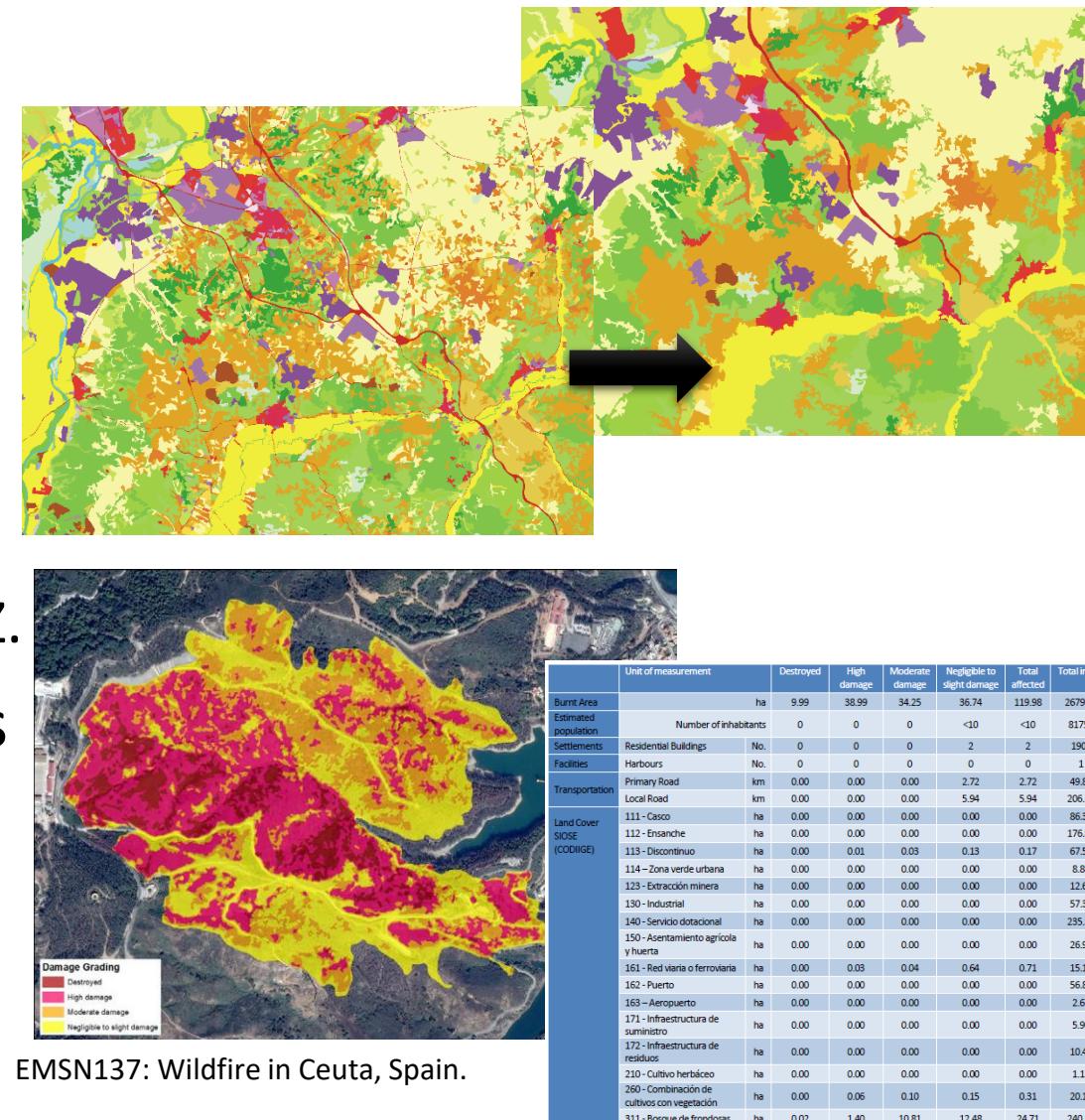


Users



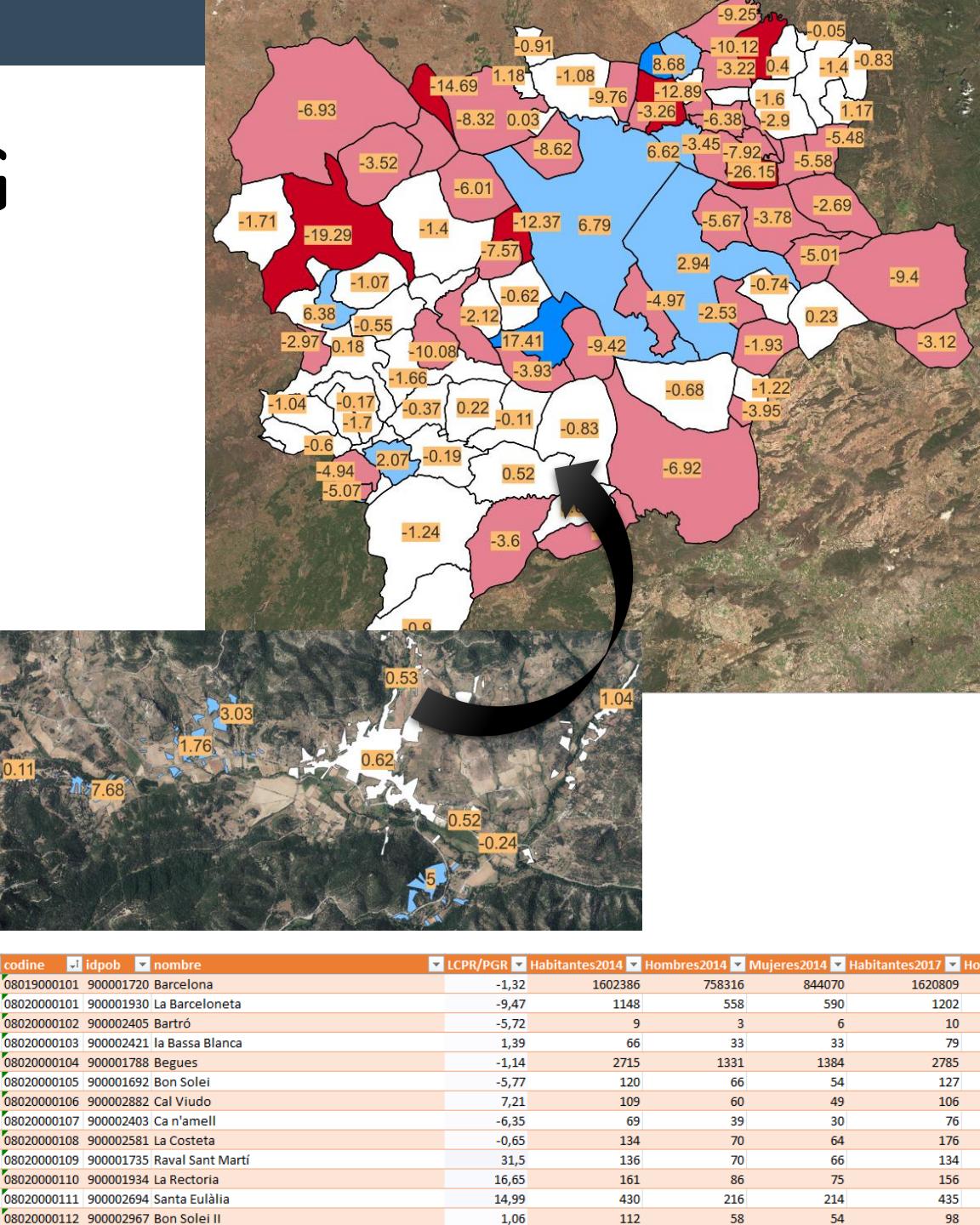
Example applications: Copernicus & EIONET

- Copernicus Land Monitoring Service & EIONET
 - National data provision
 - Expertise and knowledge. Part of EAGLE
 - Data production and validation: CORINE Land Cover (version 2012-18 from SIOSE generalization) and contrast of HRL, RZ, CZ.
- Copernicus User Forum representatives
- Copernicus Emergency
 - National data provision for basic maps



Example applications: SDG

- Motivation
 - **UN-GGIM: Global Statistical Geospatial Framework**, for the integrated production of stat data enabled with geoinformation <https://ggim.un.org/UNGGIM-expert-group/>
 - **UN-GGIM Europe: Line of Work for SDG** <https://unggim-europe.org/working-groups/low-sustainable-development-goals/>
 - Organisation for Economic Co-operation and Development (**OECD**): Toolkit for a Territorial approach to the SDGs <https://www.oecd.org/publications/oecd-toolkit-for-a-territorial-approach-to-the-sdgs-2913bae2-en.htm>
 - **National Statistic Insititue (NSI) Spain** <https://www.ine.es/dyngs/ODS/es/index.htm>
- Collaboration with NSI for the generation SDG indicators based in LCLU, Settlements and Population
 - 11.3.1 Ratio of land consumption rate to population growth rate
 - 11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities
 - ... and others coming soon





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Thanks

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