Cadastral information as support for natural disaster management

JOINT PCC AND EUROGEOGRAPHICS CLRKEN CONFERENCE AND PLENARY MEETING

Rocío Rodríguez Molina
Spanish General Directorate for Cadastre

Characteristics of Spanish Cadastre

1. Real Estate Identification data: Cadastral reference and location.

2. Juridical data of real estate: Titleholders' identification, their addresses, date of acquisition and type of rights.

3. Physical data of real estate: Cadastral cartography with the location and delimitation of parcels, land area, buildings area, class of crops, construction typology, conservation status of the constructions, year of construction Orthophoto, representation of the Buildings (even with the graphic description of every floor)

4. Economic data of the real estates: use (legal and actual one), value of land, value of construction and cadastral value

The Spanish Cadastre is principally a fiscal cadastre

Characteristics of Spanish Cadastre

- ✓ Currently: It is not merely an administrative register of real states
- ✓ It constitutes a **fundamental governance tool** that enables:

The **articulation** of public policies.

The **organization** of territory

The **coordination** of **actions** between the Administration, citizens, and the land.

GOBIERNO DE ESPAÑA
VICEPRESIDENCIA PRIMERA DEL GOBIERNO
MINISTERIO DE HACIENDA
SECRETARÍA DE ESTADO DE HACIENDA
DIRECCIÓN GENERAL DEL CATASTRO

eurogeographics

Danish Geodata Agency

PCC
Permanent Committee on Cadastre in the European Union

Cadastral information is key for managing natural disasters, in the preventive phase, during the disaster and in post-disaster recovery. Its use enables more accurate planning, damage assessment, and coordination of aid.

- **Before the disaster: prevention and planning**

Cadastral information —which includes data on properties, buildings, land use, and parcel boundaries— is used to:

- ✓ Identify vulnerable areas: by cross-referencing cadastral data with risk maps (floods, earthquakes, wildfires, etc.), high-risk zones can be detected.
- ✓ Plan evacuations and shelters: knowing population density and building locations helps organize evacuation logistics and temporary shelter placement.
- ✓ Design resilient infrastructure: guides urban development toward safer areas and ensures buildings comply with seismic or flood-resistant standards.
- ✓ Simulate risk scenarios: using geospatial models that integrate cadastral and environmental data.

- **During the disaster**

During prolonged environmental disasters, cadastral information becomes a vital asset for crisis management and recovery.

Infrastructure data, it enables authorities:

To identify safe zones,
To assess available facilities,
To plan the relocation of affected populations efficiently

- **After the disaster: assessment and recovery**

After a catastrophic event, the cadastre becomes essential for:

- ✓ Assessing material damage: comparing the pre-disaster state of properties with post-disaster conditions helps quantify losses.
- ✓ Managing aid and insurance: cadastral data verifies property ownership and helps calculate compensation.
- ✓ Orderly reconstruction: guides urban rehabilitation while respecting territorial planning and avoiding settlements in hazardous zones.
- ✓ Updating maps and records: incorporates physical changes to the territory to keep cadastral databases current.

Integration with other data sources

Cadastral information can be combined with:

- Meteorological data (precipitation, extreme temperatures).
- Hydrological models (to predict flooding).
- Satellite imagery (to detect changes in the terrain).
- Civil protection databases (to coordinate evacuations and resources).

This integration enables the creation of predictive models and dynamic risk maps.

Institutional Collaboration

In Spain, institutions such as:

- Civil Protection
- Ministry for the Ecological Transition
- Municipalities and Autonomous Communities
- Copernicus Emergency
- General Directorate for Cadastre

use this information to:

- Assess damage after disasters.
- Plan reconstruction efforts.
- Identify risk zones for future interventions.

Example: Identification of constructions and crops affected by the La Palma Volcano

Following the eruption of the La Palma volcano ➔ conducted to identify the constructions and agricultural areas impacted by the lava flows and ash deposits

Tools:

- Copernicus Emergency Management Service
- Aerial imagery,
- Cadastral information

This multi-source approach enabled the precise mapping of affected buildings and cultivated land, particularly banana plantations, which are predominant in the region. The resulting information has been essential for damage evaluation, recovery planning, and support to affected communities.

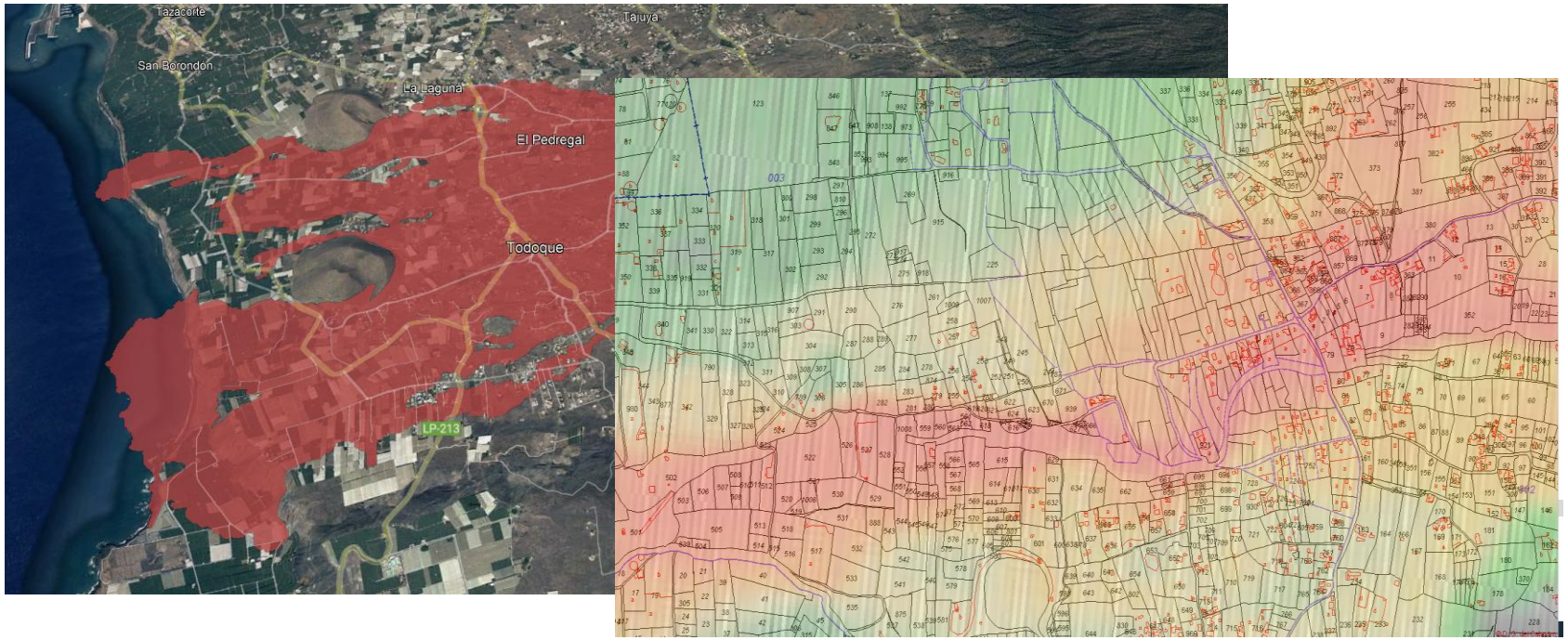
GOBIERNO DE ESPAÑA
VICEPRESIDENCIA PRIMERA DEL GOBIERNO
MINISTERIO DE HACIENDA
SECRETARÍA DE ESTADO DE HACIENDA
DIRECCIÓN GENERAL DEL CATASTRO

eurogeographics

Danish Geodata Agency

PCC
Permanent Committee on Cadastre in the European Union

Example: Identification of constructions and crops Affected by the La Palma Volcano



Example: flooding events like a “dana” (Mediterranean storm)

EL PAÍS

SUSCRÍBETE

E Mapa | Colegios, residencias o industrias: los lugares de cada municipio en riesgo ante una inundación extrema

MONTSE HIDALGO PÉREZ / JOSÉ A. ÁLVAREZ / DANIELE GRASSO

La cartografía oficial permite identificar las más de 5.000 infraestructuras que acabarían con daños graves si se produjera un fenómeno como la dana que arrasó los pueblos del sur de Valencia

The image shows a news article from El País discussing flood risk in Spain. It highlights official maps that identify over 5,000 vulnerable infrastructures—such as schools, nursing homes, and industrial sites—that could suffer severe damage during extreme flooding events like a “dana” (Mediterranean storm). The visuals include satellite-style maps marking high-risk areas across different municipalities.

Benefits

- Faster decision-making: thanks to precise data on properties and land use.
- Transparency in compensation: it’s possible to verify which assets were affected.
- Improved urban planning: by avoiding construction in high-risk areas.
- Greater territorial pliability: through infrastructure designed to adapt to environmental conditions.
- Enhance resilience: Integrating cadastral, environmental, and geospatial data allows for better preparedness and adaptation to future events.

Cadastral information as support for natural disaster management

JOINT PCC AND EUROGEOGRAPHICS CLRKEN CONFERENCE AND PLENARY MEETING

THANK YOU!!!

Rocío Rodríguez Molina
Spanish General Directorate for Cadastre