URBAN GROWTH MONITORING WITH COPERNICUS DATA

Satellite derived information provides a quantified expertise for the assessment and evaluation of territorial development policies.

The challenge

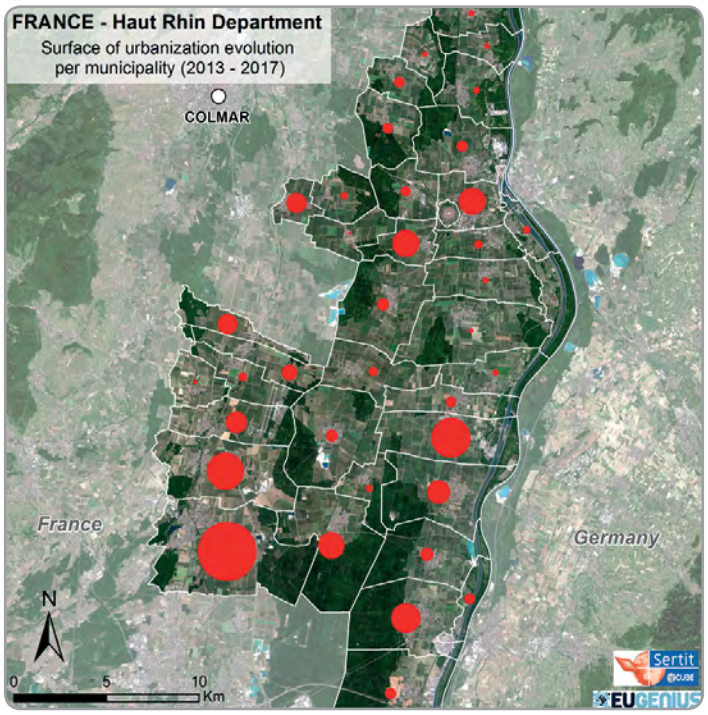
Within a climate change adaptation perspective linked to the increasing importance of sustainable management of our environment, territorial authorities involved on this subject have an increased need for geo-information providing the support to realise their missions, especially those related to the development of a territory in compliance with ecological and sustainability considerations or directives.

Amongst these needs, the regular measurement of urban zone development and the consumption of space is helpful for green and blue infrastructure assessment, for local biodiversity - green corridor preservation which is linked to the artificialisation of landscapes at local level, and more generally for the setting up of specific indicators and environment profile diagnostics, or synthetic documents at regional level allowing the monitoring of the "Grenelle de l'Environnement", French Ministry of Environment policy, especially through the setting up of sustainable development planning tools.

This information, today not available regularly (i.e. annually), is needed by Urban and Land Planning authorities in order to monitor the realisation of officially authorised urban planning directives, to forecast new urbanisation trends and needs, and to help them in their decision making process regarding the regional and local application of spatial and environmental politics (e.g. for France, PLU, SCOT, SRCE,...). This need for monitoring highlights the pertinence of the exploitation of Earth Observation techniques compared to more traditional approaches (e.g. aerial photos, administrative document collection and compilation, in–situ data and field campaign).

The space based solution

Based on the use of Copernicus satellite data and local information, the urban growth monitoring service, provided by SERTIT within the H2020 EUGENIUS project (European Group of Enterprises for a Network of Information Using Space), is dedicated to urban and land spatial planning users in charge of the setting up & control of local urban plans, of the monitoring of the development of new constructions within authorised built up areas, and of the assessment of remaining available spaces in urban planning documents; these geo-information are derived and mapped from multi-temporal satellite data.



Surface of urbanization evolution per municipality between 2013 and 2017 in the East part of the Haut-Rhin department of the Grand Est region (France).

Thematic Area: TERRITORIAL MANAGEMENT AND URBAN PLANNING

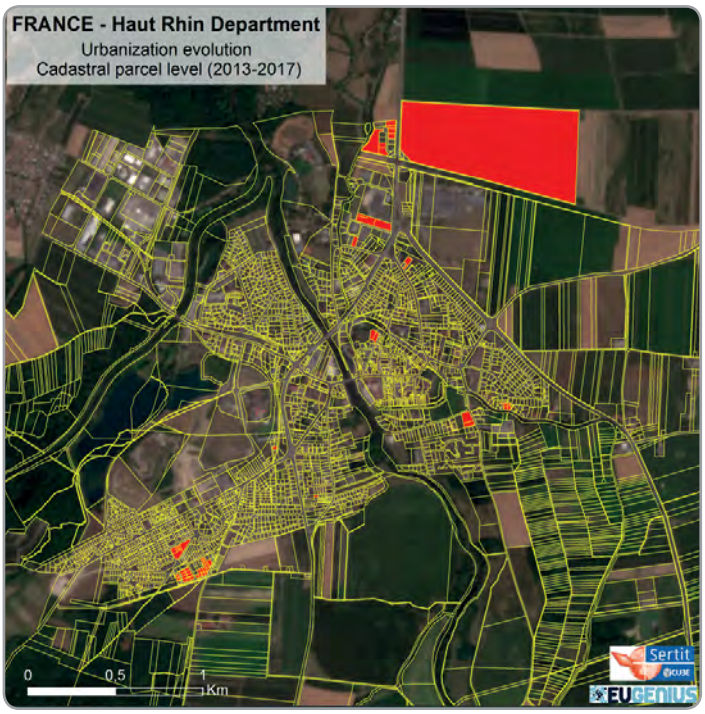
Region of Application: HAUT-RHIN

Sentinel mission used: S2

Copernicus Service used: –

Usage Maturity Level: 3/4

Whereas Sentinel-2 data (10m) are used for monitoring the urban zone development at a global municipality level and in peri-urban areas, contributing missions satellite data, such as Pleiades (50 cm) or SPOT6-7 (1.50m), combined to local datasets, such as the local urban plan (PLU) or the cadastre, allow this monitoring to be refined on a more detailed scale, i.e. of the urban plan sector or at a cadastral parcel level. Thereby, on both spatial and temporal scales, this information also complements the core Copernicus products related to urban areas (e.g. Urban Atlas, HR layers, CLC).



Cadastral parcels affected by urbanization evolution between 2013 and 2017.

> "It is important to have an objective indicator to measure the evolution of urbanization."
>
> ***Dominique Esnault, ADAUHR - ATD 68, Agence Technique Départementale du Haut-Rhin***

Benefits to Citizens

Deployed in the Eastern part of the Haut- Rhin department of the French Grand Est Region during the first year of the EUGENIUS project, the urban growth monitoring service has allowed assess, for the 2013-2017 time period, to the evolution of 44 municipalities situated along the French - German border, a sector of special interest for the annual monitoring of the economic impact of the future closure of a nuclear plant.

Outlook to the future

Within EUGENIUS, the service is progressively being assessed in other European regions which are also concerned by sustainable territory management and space consumption issues (e.g. Apulia region in Italy). Moreover, this information could also be of interest for the private sector, public works or building companies (e.g. updated knowledge of available areas for urbanisation) or even for the individual citizen concerned about the development of his surrounding environment.

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N. Tholey, M. Caspard, V. Gastal and P. de Fraipont,
ICube-SERTIT, France
Email: nadine.tholey@icube.unistra.fr

ABOUT COPERNICUS4REGIONS

This Copernicus User Story is extracted from the publication "**The Ever Growing use of Copernicus across Europe's Regions: a selection of 99 user stories by local and regional authorities**", 2018, Edited by NEREUS, the European Space Agency and the European Commission.
The model cases focus on local and regional authorities who successfully applied Copernicus data in 8 major public policy domains.

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