

# Feedback on the collaborative program managed by the French National Mapping Agency

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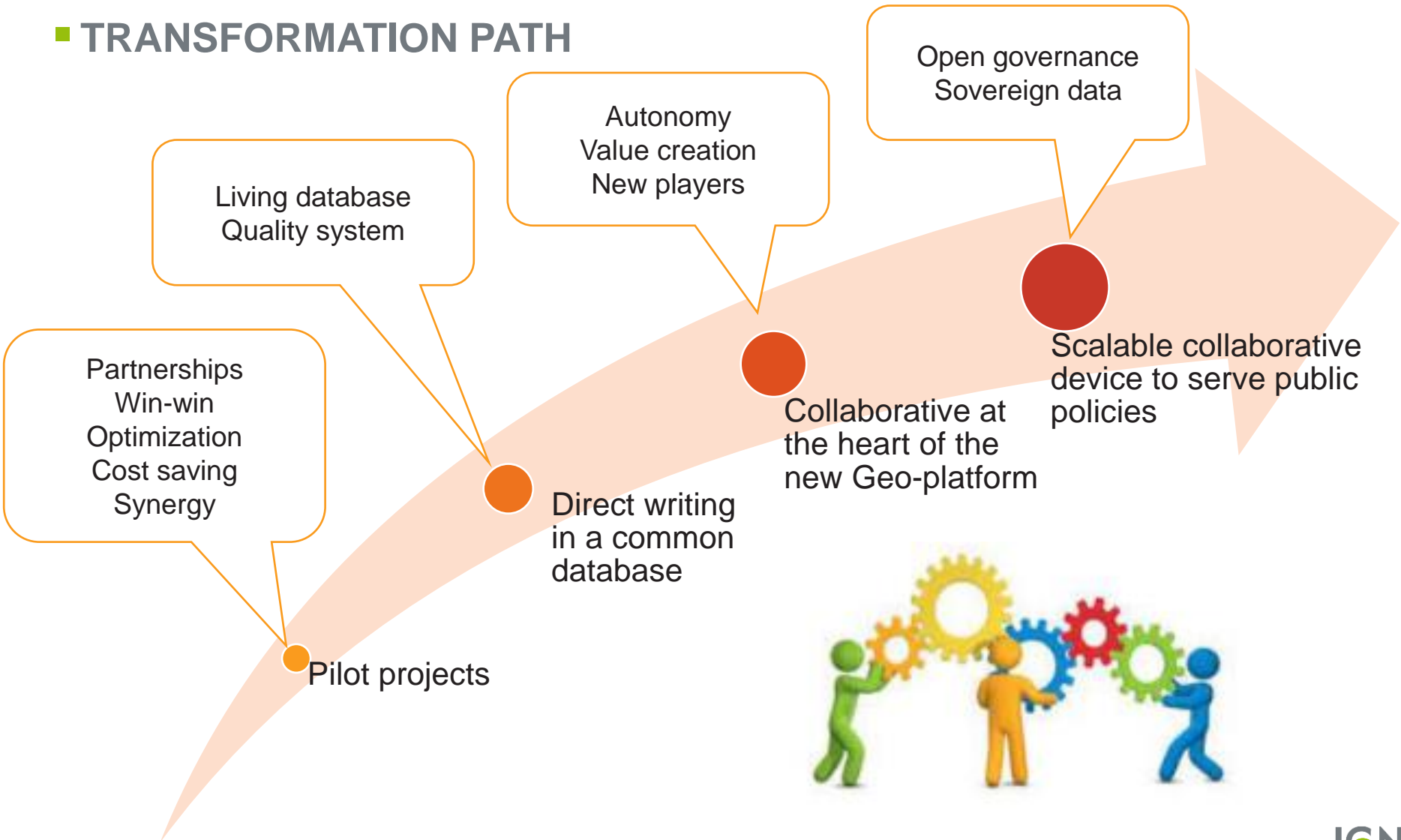
# Outline

- The new collaborative ecosystem at IGN
- Crowd and community pilot: LandSense project
- Infolabs: Urclim project



# THE NEW COLLABORATIVE ECO-SYSTEM AT IGN

## ■ TRANSFORMATION PATH

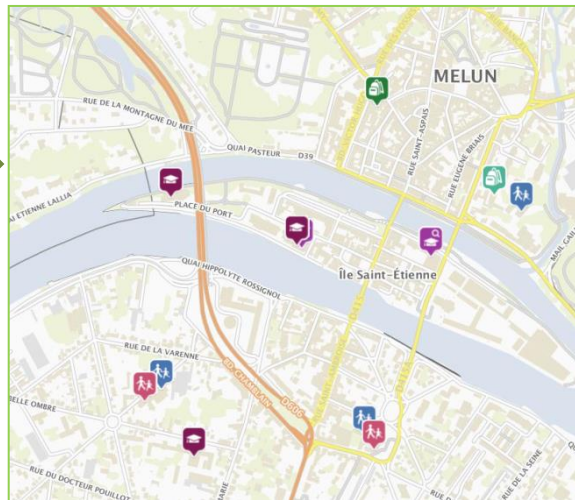


# THE NEW COLLABORATIVE ECO-SYSTEM AT IGN

## ■ 2 TYPES OF COLLABORATION...FOR 2 TYPES OF PARTNERS

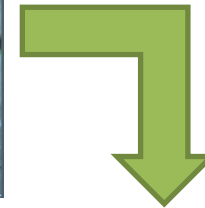
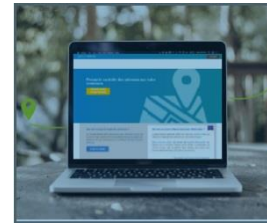
Data integration:  
the partner provides its data

*E.G : French ministry of education*



Co-production:  
the partner participates to the mechanism

*E.G : local communities for address*



# THE NEW COLLABORATIVE ECO-SYSTEM AT IGN

Mobile application

## EXISTING TOOLS

### Flagging

- 📍 Simplified contribution: locate a flag and fill few fields
- 📍 Requires an expert to actually validate the data modification

### Direct input

- 📍 Editing tools
- 📍 Control tools

### Consultation

### Extraction

### Diffusion

### Espace-collaboratif

### Espace-professionnel



géoportail

### Espace-collaboratif



### GIS Plugins



### Adress desk



### Thematics desks



# THE NEW COLLABORATIVE ECO-SYSTEM AT IGN

## ■ LEVERAGES FOR TRANSFORMATION

- Changing processes and production methods
  - Cross-functional program dedicated to coordinate the collaborative actions
  - Creation of multidisciplinary teams
  - Closer institutional relations
  
- Having new tools integrated into the Géoplateforme
  - Common API available
  - Integration tools
  - Co-production tools
  
- Stimulate the collaborative network
  - Linked with the open governance program
  - Based on the user communities
  - Coordinated with existing territorial animation

# THE NEW COLLABORATIVE ECO-SYSTEM AT IGN

## ■ A FEW FIGURES

- 300 national partners impacting more than 200 000 objects by year
- 4000 local authorities involved into the address desk
- 15000 new or modified address each month
- 40% of the POI directly derived from partner data
- 4000 flags reported each month to help updating the data



➔ **On going process!**

# Outline



The new collaborative ecosystem at IGN



Crowd and community pilot:  
LandSense project



Infolabs: Urclim project

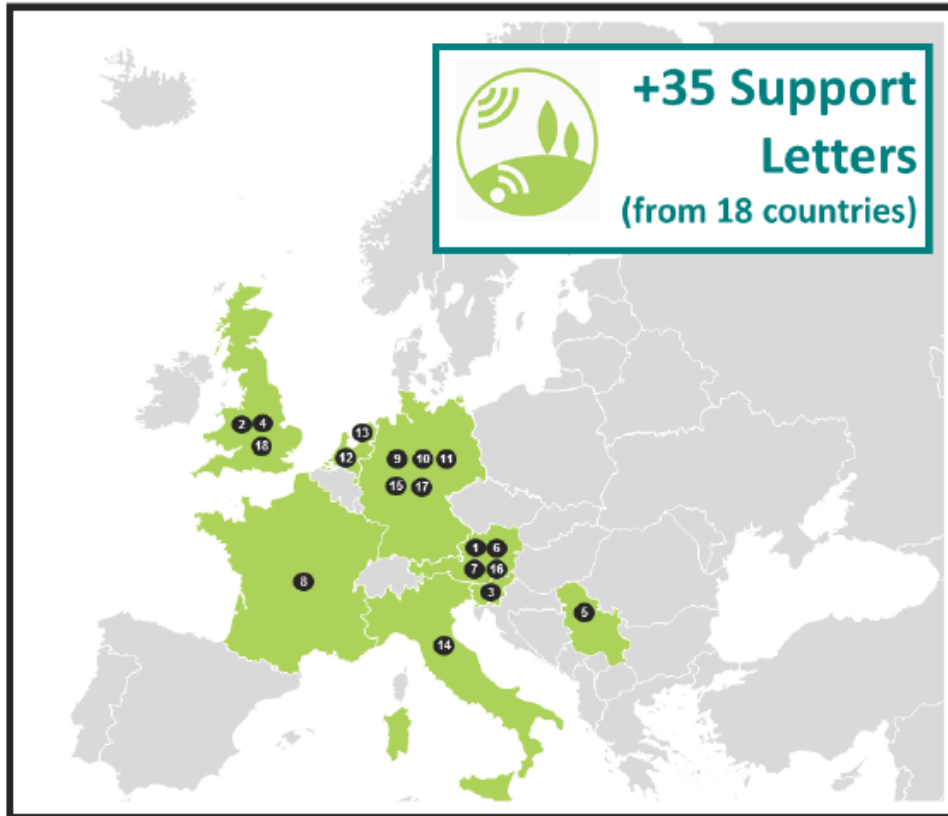


An aerial photograph of a rural landscape. The scene is dominated by green fields, some of which are planted in rows, suggesting agricultural use. A network of roads and paths crisscrosses the area. In the upper right, there are several buildings, including a large one with a dark roof and a smaller white one. The lighting is bright, casting long shadows from the trees and buildings, indicating it's either early morning or late afternoon. The overall color palette is rich with greens, browns, and greys.

# LANDSENSE

**A Citizen Observatory and Innovation Marketplace  
for Land Use and Land Cover Monitoring**

# LANDSENSE : CONSORTIUM

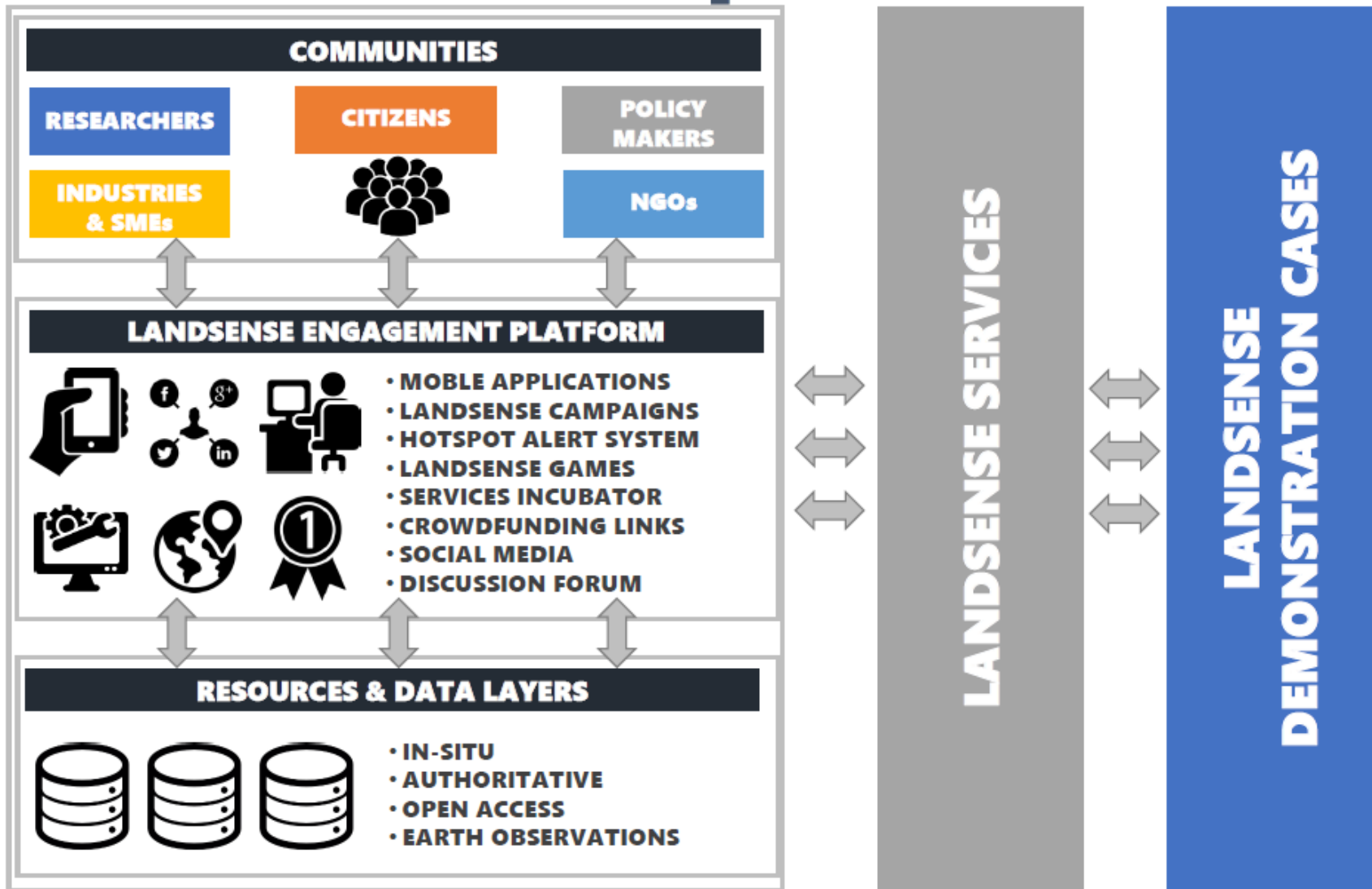


- 1 International Institute for Applied Systems Analysis
- 2 Birdlife International
- 3 Sinergise
- 4 University of Nottingham
- 5 InoSens doo
- 6 GeoVille Information Systems GmbH
- 7 Environment Agency Austria
- 8 Institut National de l'Information Géographique et Forestière
- 9 European Citizen Science Association
- 10 StZ Felis
- 11 University of Heidelberg
- 12 Wageningen University
- 13 VU University Amsterdam
- 14 Joint Research Centre
- 15 Secure Dimensions
- 16 Friends of the Earth/Global 2000
- 17 City of Heidelberg
- 18 KriticalMass



Horizon 2020  
European Union funding  
for Research & Innovation

# LANDSENSE ENGAGEMENT PLATFORM



# LANDSENSE ENGAGEMENT PLATFORM

## ■ 4 SERVICES



**LandSense Campaigner**



**Farmland Support**



**Change Detector**



**Quality Assurance & Control**

## ■ 3 DEMO CASES, 8 PILOTS



**Urban & Rural  
Landscape Changes**

France, Germany, Austria, and Netherland



**Agricultural  
Land Use**

Serbia



**Habitat & Forest  
Monitoring**

Spain, Indonesia

<https://lep.land sense.eu/>

# IGN CONTEXT

- IGN produces The Large Scale reference system (RGE®) and LULC



LULC (2016)

- two attributes:  
LC and LU
- 17 LU classes
- 14 LC classes

- Update policy : **cyclical** (every 3 years)
- Two dates : 2013, **2016**

# IGN PILOT GOAL

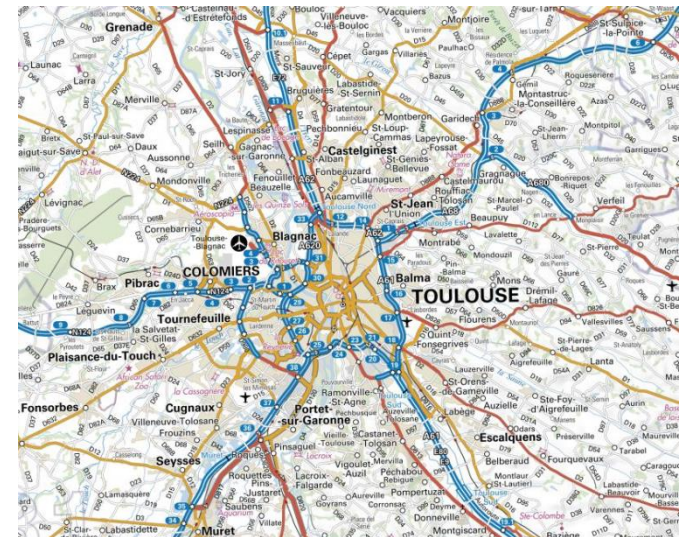
## ■ Update, Improve, and Validate LULC

- Using mobile and web-based applications
- Organising **campaigns** involving crowd and community sourcing
- Using Change Detection and Quality Assessment services



## ■ Pilot : **Toulouse** and its **surrounding areas**

## ■ Bundle of campaigns: 2018 to 2019



# TOOLS TO CONTRIBUTE : PAYSAGES

## THREE TOOLS TO CONTRIBUTE

PAYSAGES web:

<https://paysages.ign.fr/>

PAYSAGES mobile:

(Android and Apple store)

PAYSAGES semantic wiki:



CS 1.2.1

Libellé: Sols nus  
 Définition: Terrains naturels à sol nu  
 URL: 2004-02-2007-03 en zone constructible - 00 - 10 m - 1500 - sans objet - 1400 - sans objet  
 Statut: Recensement - Taux de recensement du sol nu supérieur à 50% de la surface de référence. En particulier, le taux de recensement de la végétation est inférieur ou égal à 25%.  
 Description: Ils regroupent les sols couverts de sable, de galets, de rochers, surfaces perméables ou tous autres matériaux minéraux. Cette classe exclut les terres arables (CS2 2.1).

CS 1.2.1  
 Libellé : Sols nus  
 Légende : 204 : 204 : 204  
 Category CS

Legende  
 ● Bâtiment  
 ● Carrière  
 ● Zone agricole  
 ● Zone en transition  
 ● Surface de détection du changement

10 meilleurs contributeurs « terrain »	
Username	Nombre de visites
sturn	10
mdvandamme	9
amrainmond	8
Laurence	6
pg	3
pgallen	3
Chris_M	3
glagaffe	1
ficsg	1

10 best contributions

(a) (b) (c) Points to visit.

(d) Agricultural zones in MidiPyrénées

- Collaborative mapping and validation : thematic and geometry information

- Collaborative validation : thematic information
- In-situ*, guided campaign

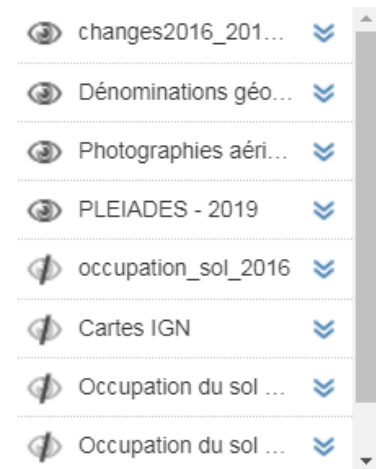
- Inform and help contributors
- Describe metadata

# PAYSAGES: WEB APPLICATION

WMS

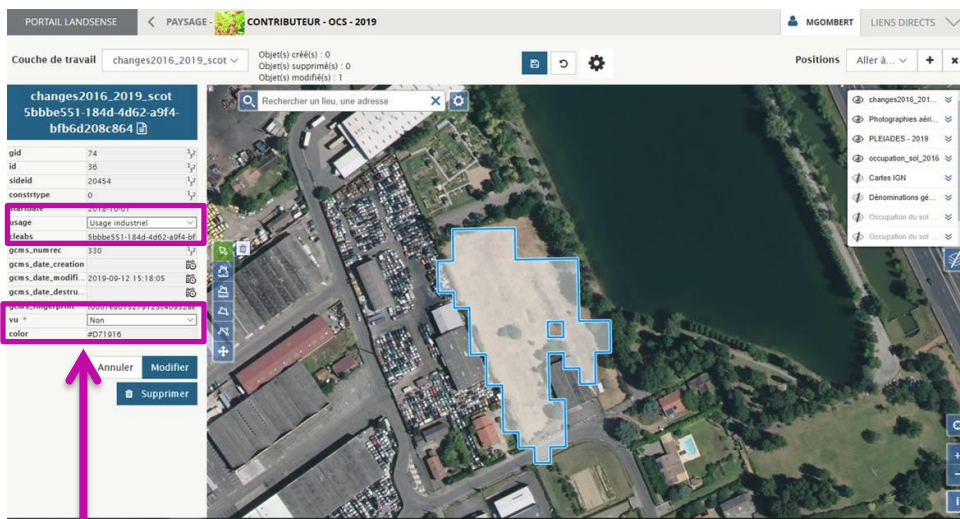
## FUNCTIONALITIES

- Validation tasks
- Attribute and Geometry edition
- Data management: store, conflict, history

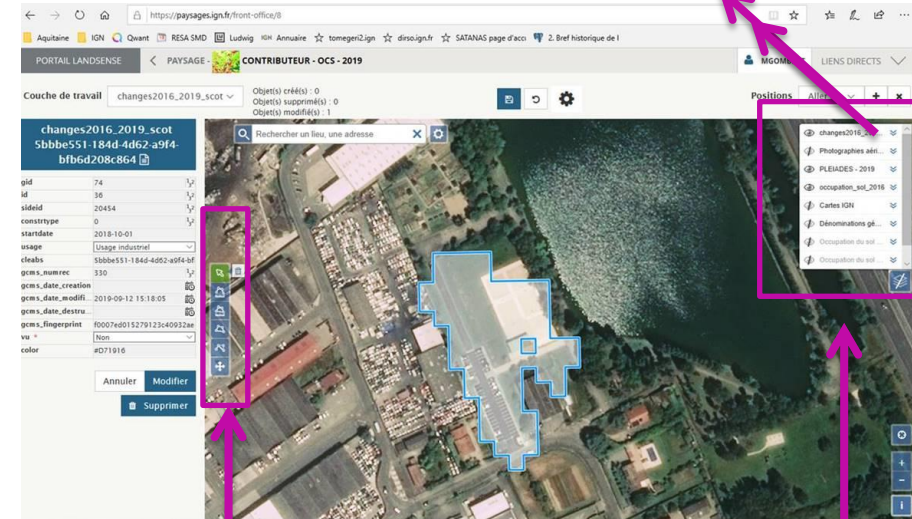


2016

2019



Attribute edition



Geometry edition

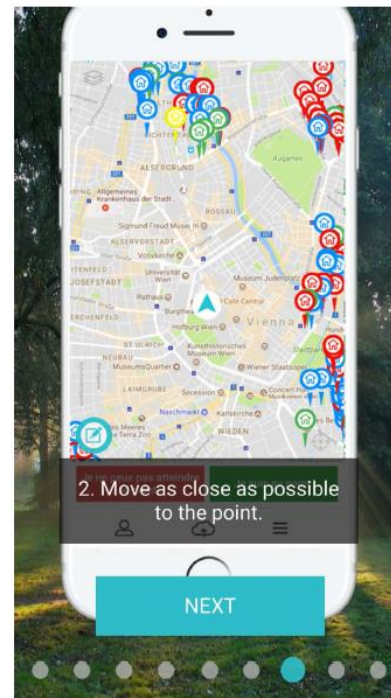
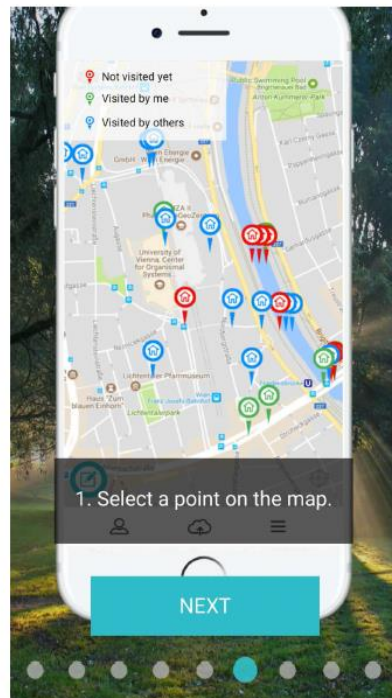
Validation layers



# PAYSAGES: MOBILE APP

## FUNCTIONALITIES

- Position and distance measures
- Attributes edition and Validation tasks
- Photos
- Gamification



# CAMPAIGNS

# CAMPAIGNS

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- **Goals**

- LULC classification : LU 2 (Industrial), LU3 (Commercial), LU5 (Residential)
- Change validation : changes detected by the change detection service from 2016-2019

- **Organise Maphatons: *in-situ* and *in front of the desk***

- **Targets: experts from local authorities, students, citizens**

# CAMPAIGNS

- 131 contributors
- 7000 observations
- 420+ in-situ photos

## Campaign 1

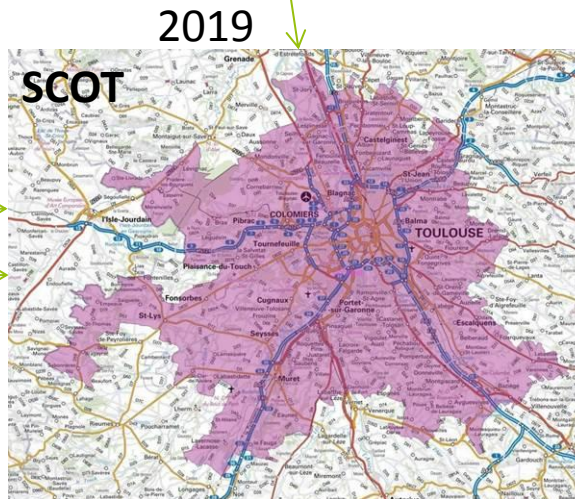
- LULC classification
  - LULC 2016
- Target: **experts**
- **Paysage mobile**

## Campaign 2

- LULC classification
  - LULC 2016
- Target: **citizens**
- **Paysage web**

## Campaign 9

- **Change validation**
  - Changes from 2016-2019
  - LULC 2016
- Target: **expert**
- **Paysage mobile**



## Campaign 3, 4, 5, 6

- LULC classification
  - Changes from 2016-2019
  - LULC 2016
- Target: **ENSG, experts**
- **Paysage web/Laco-wiki**

## Campaign 7

- LULC classification
  - Changes from 2016-2019
  - LULC 2016
- Target: **citizens**
- **Paysage web**

## Campaign 8

- **Validation changements**
  - Changes from 2016-2019
  - LULC 2016
- Target: **experts**
- **Paysage web**

# **RESEARCH ASPECTS : USE OF COLLECTED DATA TO IMPROVE AND UPDATE LULC**

# QUALITY ASSESSMENT

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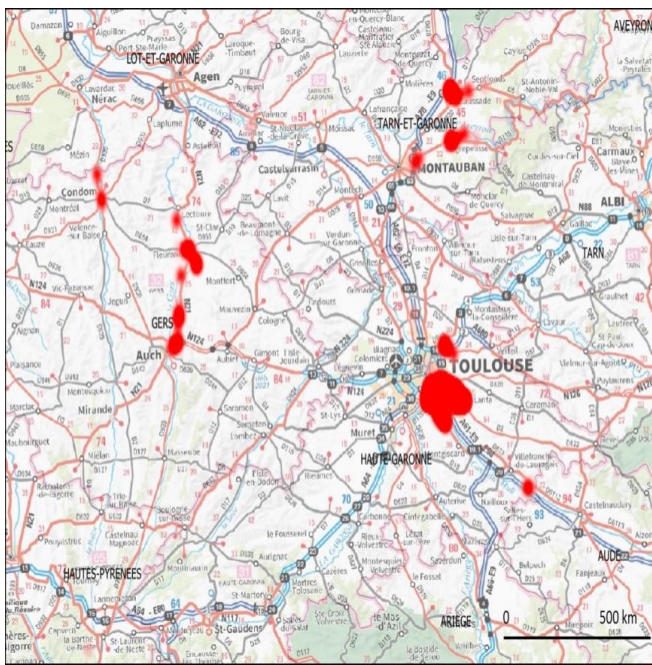
## ■ OBSERVATIONS:

- Contributor Agreement : Fleiss Kappa
- Categorical accuracy : Confusion Matrix
- Contributor's profiles analysis

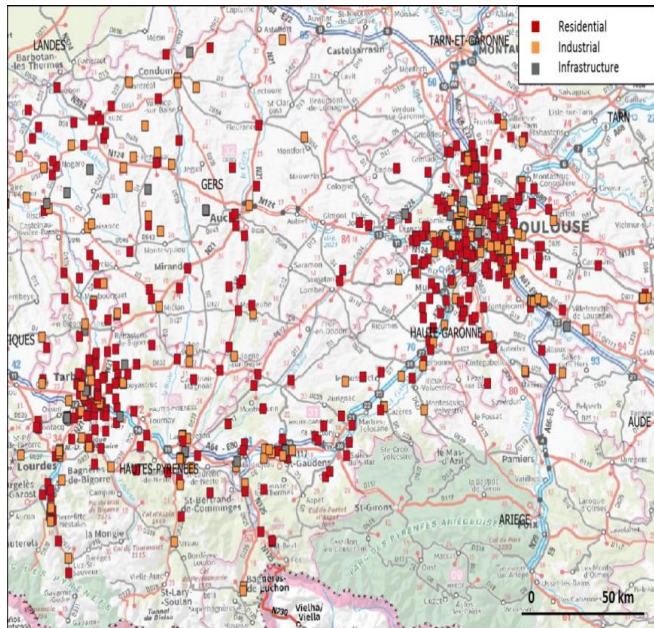
## ■ PHOTOS:

- Face detection and blurring
- License plate detection and blurring
- Blur and Illumination checking

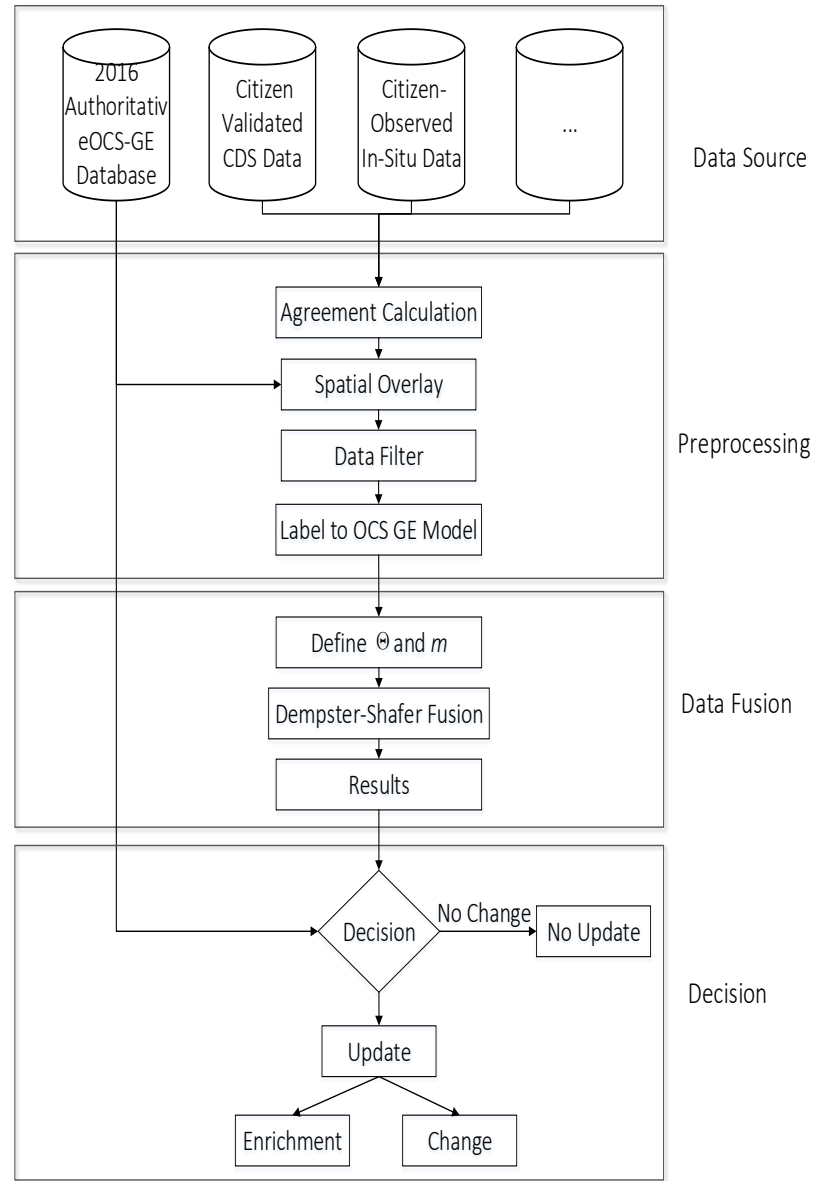
# Workflow for integration of citizen-observed data in authoritative systems



In-situ citizen-observed data : changes occurred in authoritative LULC data

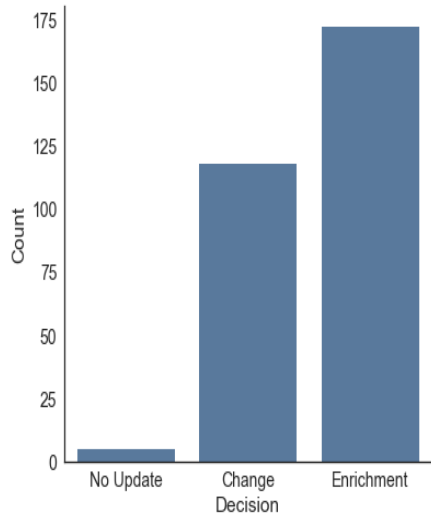


Validated changes coming from the Change Detection Service (CDS)



# Workflows for integration of citizen-observed data in authoritative systems

The distribution of Dempster-Shafer derived solutions : in total, there are **295 LULC polygons** concerned by changes in CDS and in-situ data

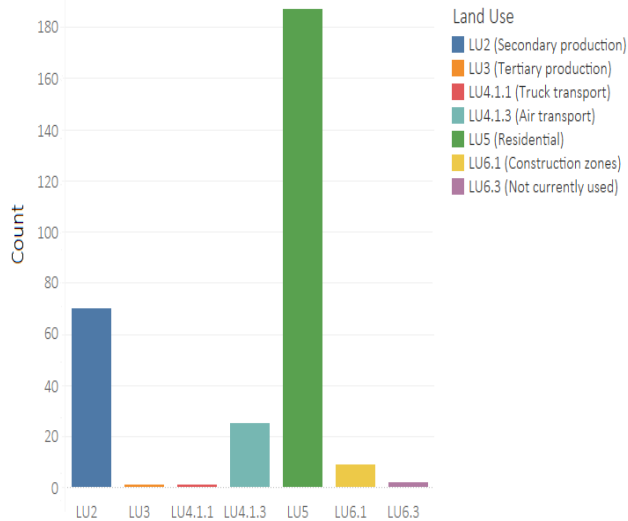


In-situ citizen-derived data

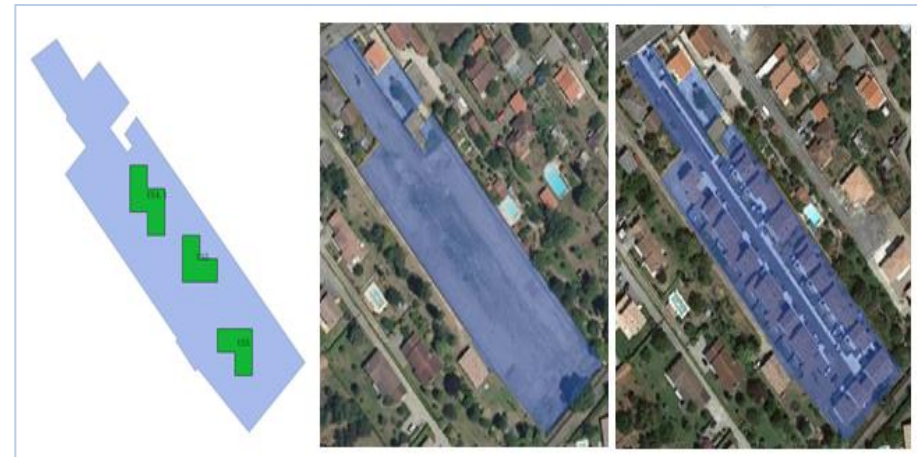
LULC data 2016: LU 235  
(Industrial, Commercial, Residential)

Workflow results: LU 5 (Residential)

Distribution of updating decisions obtained by applying the proposed workflow



## Example: Update of LULC data



Validated changes

LULC data 2016: LU6.3  
(Not currently used)

LULC data 2019  
Workflow results: LU 5 (Residential)

**! Big potential of citizen-derived data to improve LULC authoritative data , one of the most relevant need expressed by LULC users**

# LANDSENSE PILOT

## ■ Lesson learned

- Define and moderate the community is a difficult task, generally underestimated
- Motivation: Involve the potential contributors from the beginning : needs, tools functionalities, etc., build a win to win relationship
- Web and in-situ guided campaigns: found the optimal balance
- Big potential of citizen-derived data to improve LULC authoritative data, one of the most relevant need expressed by LULC users

# Outline



The new collaborative ecosystem at IGN



Crowd and community pilot: LandSense project

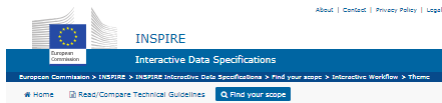


Infolabs: Urclim project



# CONTEXT: USER ACCESS TO GEOGRAPHICAL DATA

## E.G. : « DATA ABOUT GREEN SPACES IN CITIES... »



### Interactive Workflow



#### Annex I

- Administrative Units
- Cadastral Parcels
- Geographical grid systems
- Hydrography
- Protected Sites
- Transport Networks
- Addresses
- Coordinate reference systems
- Geographical Names

#### Annex III

- Atmospheric Conditions
- Biogeographical Regions
- Buildings
- Environmental Monitoring Facilities
- Human Health and Safety
- Land Use

#### Annex II

- Geology
- Ortophotography
- Elevation
- Land Cover

**OpenELS** European Location Services

HOME ABOUT PRODUCTS DATA POLICY EVENTS LATEST HELP DESK

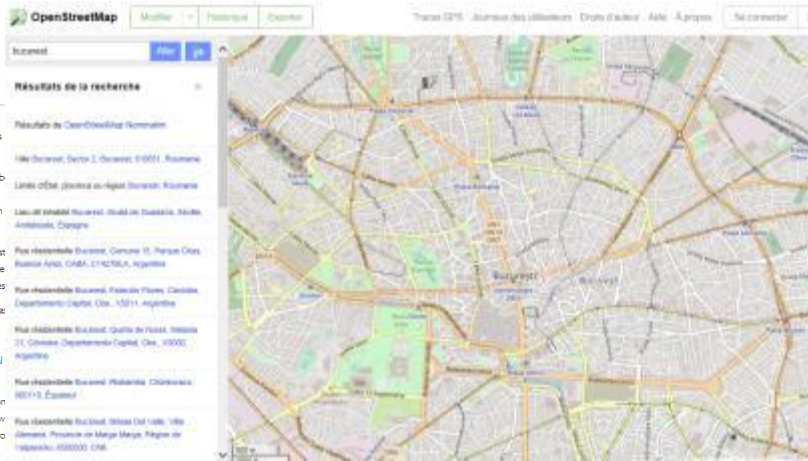
The definition, specification and development of data products and web services with a strong user focus key task for the Open ELS Project.

During the first 12 months of the Project, the team has worked closely with users to understand more about customer interest in, and requirements for, pan-European open data. This has involved user workshops, meetings and evaluation of early-stage services, in addition to collaborating with Joint Research Centre on researching requirements and use cases for gazetteer services as part of the ELISE programme.

Based on this, the team has defined six high-priority services, which have been validated with users, against data availability and technical feasibility. A selection of these will be developed within the remainder of the Project. Evaluation and feedback of the initial services will be used to develop and enhance future releases.

**EuroGlobalMap as a Service** – making existing EuroGeographics open data available through Open ELS as a web feature service, will allow improved access for users. It will allow the project team to offer a pan-European open data topographical product as part of the suite of Open ELS services, including future enhancements planned such as generalised NUTS3 boundaries which will enable connections to statistical data.

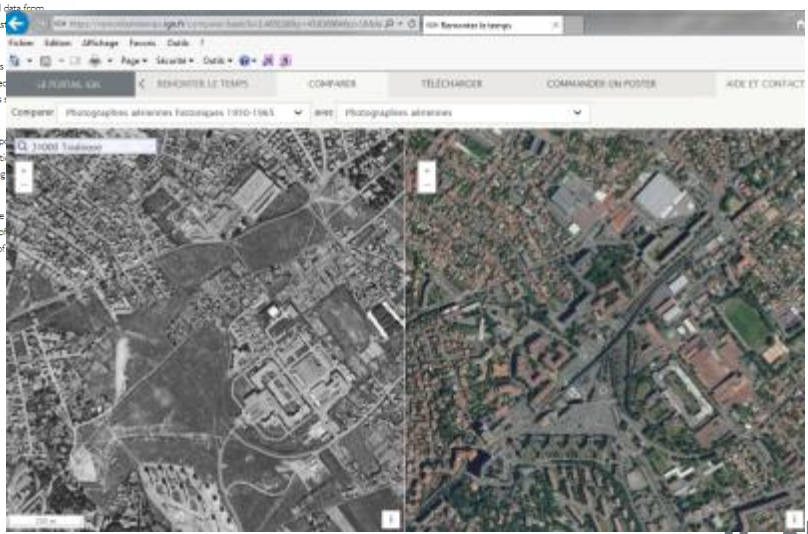
**Regional Geographical Names** – There is significant interest in availability of maintained pan-European gazetteers based on authoritative data to enable geocoding and a range of applications. Using content from EuroGeographics, the project team is developing a regional level, which can be further developed into a unique pan-European index of authority (cadastral reference) with other useful data formats to cross-border authoritative bodies.



...this service will allow a single access point in a diverse range of sectors who need, in addition to supporting address geocoding, to be able to use the service for a range of applications such as local planning purposes in addition to supporting urban planning.

...this service will allow a single access point which will enable applications such as local planning purposes in addition to supporting urban planning.

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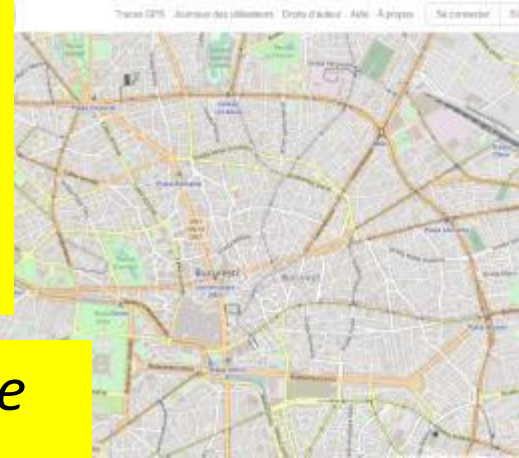


# USER ACCESS TO GEOGRAPHICAL DATA

*Lots of sources and criteria to consider :*

- *Different technos and funding programs*
- *Different kinds of uncertainties to consider*
- *Different kinds of « costs »*
- *Need to access also software to pre-process the data to feed user application*

DATA IS



*Need for a dynamic solution and not one shot analysis (because fast evolving context, new data, new data products, new portals, new licences... new processing methods...)*

*Portals and catalogues still in silos (techno, funding program, coverage, community,..), no solution for user-oriented discovery and comparison of solutions*

- Cadastral Parcels
- Geographical grid systems
- Hydrography
- Protected Sites
- Transport Networks
- Addresses
- Coordinate reference systems
- Geographical Names
- Biogeographical Regions
- Buildings
- Environmental Information
- Human Health and Environment
- Land Use

## Annex II

- Geology
- Orthomaps
- Elevation
- Land Cover



What is Copernicus?

Infos & Opportunities

Finders & Grants

Documentation

Research

News

Newsletters

Events

The Copernicus Climate Change Service (C3S) responds to environmental and societal challenges associated with human-induced climate changes.

The service will give access to information for monitoring and therefore, help to support adaptation and mitigation. It benefits and satellite-based observations, re-analysis of the Earth climate a variety of climate projections.

The service will provide access to several climate indicators (e.g. sea level rise, ice sheet melting, warming up of the ocean) and climate temperature, precipitation, drought event) for both the identify climate impacts.

The Copernicus Climate Change service is under implementation.

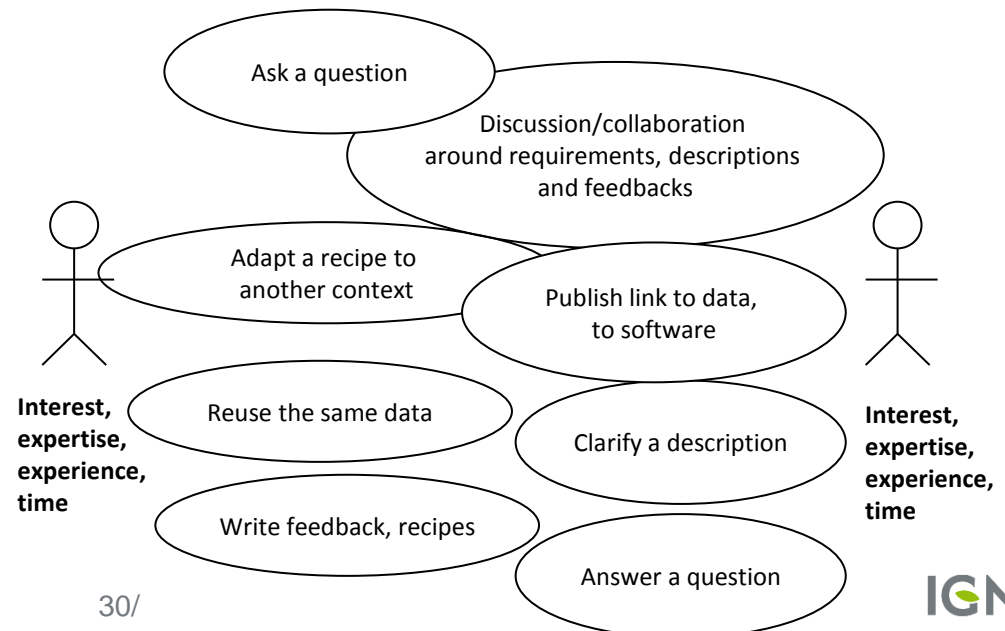
In November 2014, the European Commission signed a Deal (European Centre for Medium-Range Weather Forecasts) for the public version of the Technical Annex of this agreement is available (under Technical Documents) available on this website.

The first stage of implementation is dedicated to the so called "building and testing of the overall architecture. The operational third year of operations and it will be preceded by a pre-operational



# THEMATIC INFOLABS

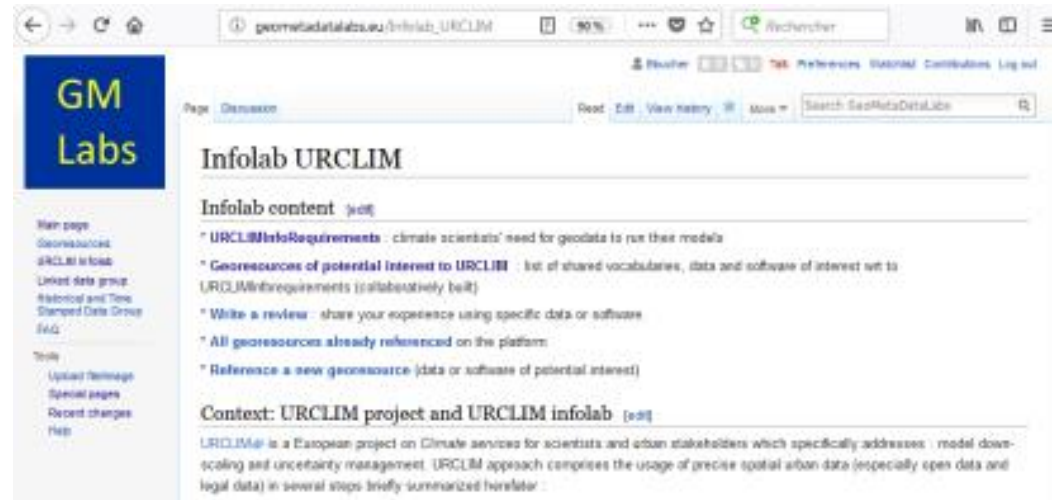
- A thematic Infolab : a social network supporting dynamic user access to geographical data across technological and community silos
  - Focused on user access to geodata on a given application domain (ex: urbanism, mobility, migration, climate) analyse what metadata are missing and how to collaboratively acquire them
  - Participants/contributors: users with different levels of expertise and experiences, data specialists, software developers, etc.



# GEOMETADATALABS.EU : A HUB FOR INFOLABS

- Platform operated by EuroSDR, connecting european geodata providers to different applications-focused infolab

- Application for the 1st prototype of infolab : Urban CLIMATE scientists (URCLIM)



- First findings: important metadata are
  - The vocabularies, schemas, taxonomies, etc used in the domain and in the sources
  - Propose sample data
  - Describe usage of software rather than software
  - Build connections between similar data



INSTITUT NATIONAL  
DE L'INFORMATION  
GÉOGRAPHIQUE  
ET FORESTIÈRE

**Thank you !!**

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European  
Commission

Horizon 2020  
European Union funding  
for Research & Innovation

# QUESTIONS ?

## ■ Collaborative strategy at IGN

- Contact : Yolène Jahard ([yolene.jahard@ign.fr](mailto:yolene.jahard@ign.fr))

## ■ InfoLabs

- Contacts : Bénédicte Bucher ([benedicte.bucher@ign.fr](mailto:benedicte.bucher@ign.fr)) and Marie-Dominique Van Damme ([marie-dominique.vandamme@ign.fr](mailto:marie-dominique.vandamme@ign.fr))

## ■ LandSense

- Contacts : Ana-Maria Raimond ([ana-maria.raimond@ign.fr](mailto:ana-maria.raimond@ign.fr)) and Marie-Dominique Van Damme ([marie-dominique.vandamme@ign.fr](mailto:marie-dominique.vandamme@ign.fr))

- Bucher B., Van Damme M.-D., 2018, URCLIM Deliverable D2.1-1, URCLIM Infolab
- Bucher, B., Tiainen, E., Ellett von Brasch, T., Janssen, P., ... , M., 2020, "Conciliating perspectives from mapping agencies and Web of data on successful European SDIs: towards a European Geographic Knowledge Graph", in SDI and the Revolutionary Technological Trends, IJGI, to be published
- Olteanu-Raimond, A.-M., L. Jolivet, M.-D. Van Damme, T. Royer, F. Ludovic, L. See, T. Sturn, M. Karner, I. Moorthy and S. Fritz (2018) An Experimental Framework for Integrating Citizen and Community Science into Land Cover, Land Use, and Land Change Detection Processes in a National Mapping Agency, *Land*, vol. 7, n. 3, [doi:doi:10.3390/land7030103](https://doi.org/10.3390/land7030103), Domaine: Science de l'information géographique, Répertoriée : Scopus, Web of Science, IF : 1.44.