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FRANCE22
PRÉSIDENCE FRANÇAISE DU CONSEIL DE L'UNION EUROPÉENNE

IGN
INSTITUT NATIONAL DE L'INFORMATION GÉOGRAPHIQUE ET FORESTIÈRE

CHANGER D'ÉCHELLE

Vers des géodonnées paneuropéennes ?

29 mars 2022

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CHANGER D'ÉCHELLE

TABLE-RONDE 1 :

Géodonnées paneuropéennes : Quels besoins, quelles ambitions et quelles applications ?

29 mars 2022

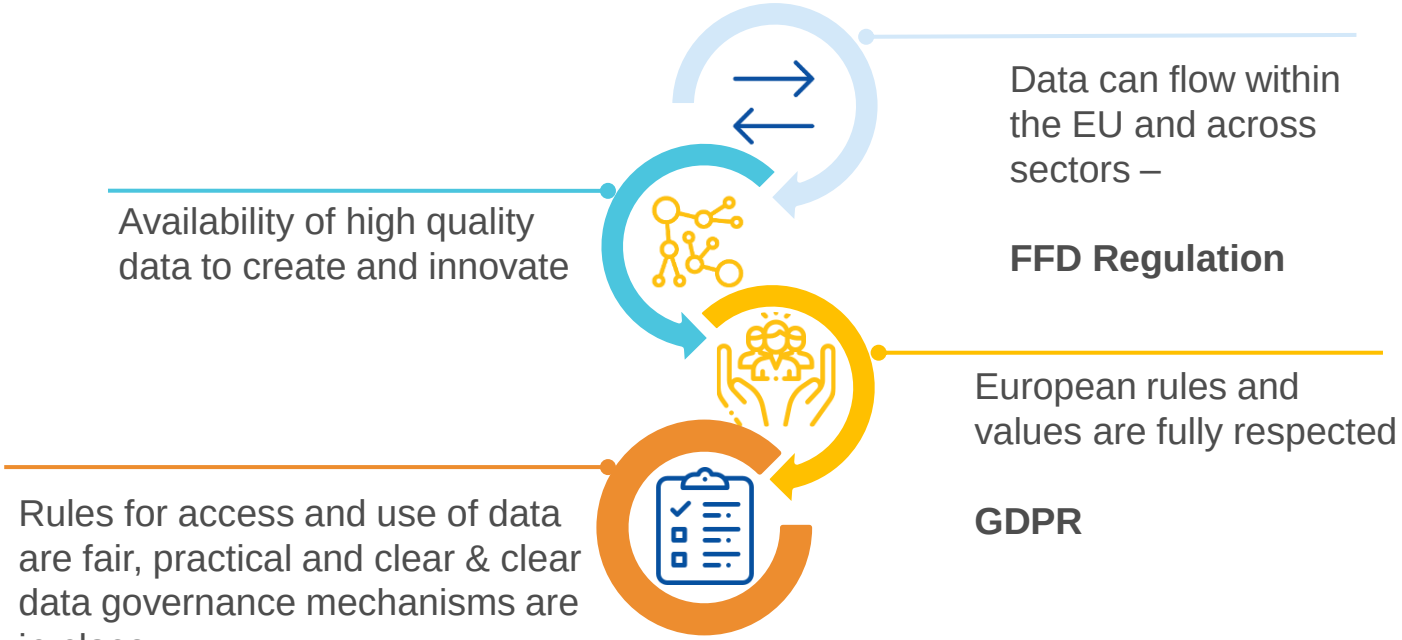
La stratégie européenne pour les données

Daniele RIZZI

DG Connect - Unité "Politique de données et innovation" | Commission européenne

European Strategy for Data

A common European data space, a single market for data



Benefitting from the second wave of industrial data

European Commission

Deploying the strategy through 4 Pillars

A cross-sectoral governance framework for data access and use

including a legislative framework for the governance of European data spaces and other cross- sectoral measures for data access and use

Enablers

Investments in a High Impact Project on European data spaces and federated cloud infrastructures

Competences

Empowering individuals, investing in digital skills & data literacy and in dedicated capacity building for SMEs.

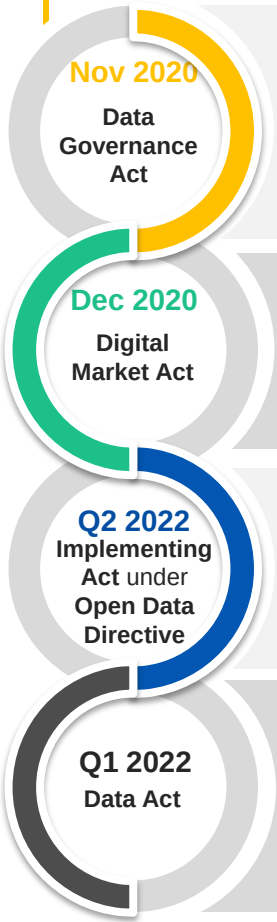
Rollout of common European data spaces

in crucial economic sectors and domains of public interest, looking at data governance and practical arrangements.

International Aspects

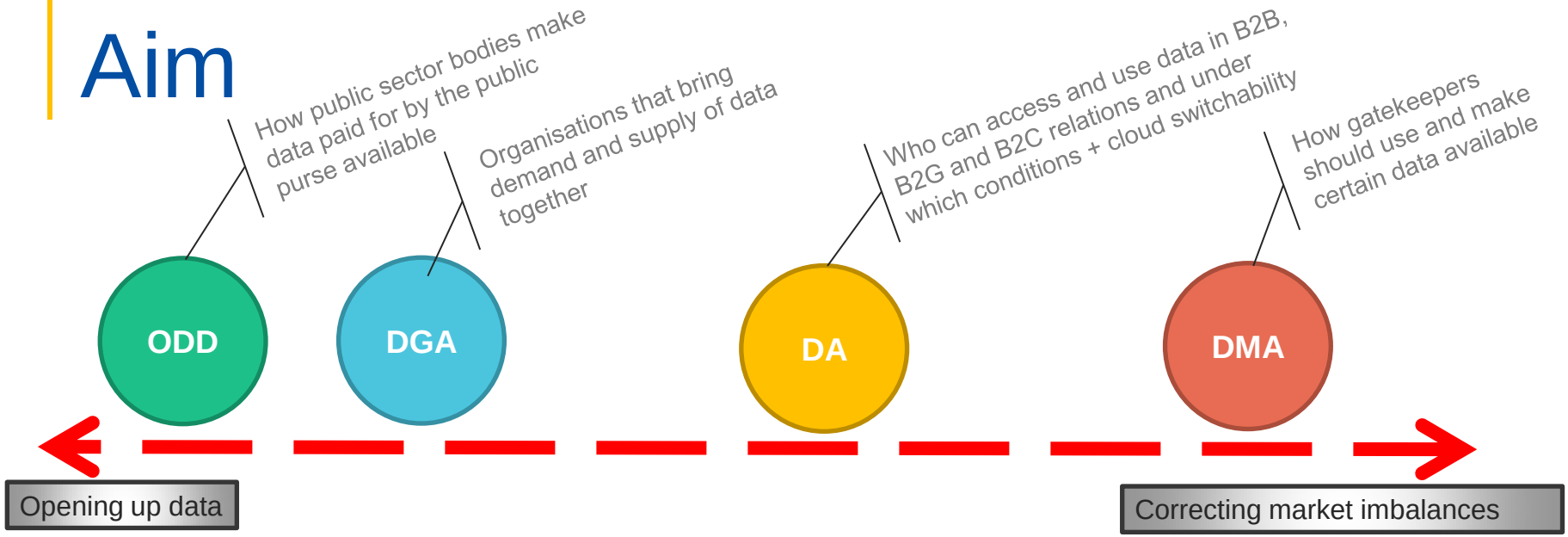
European Commission

European Strategy for Data: 4 key instruments



Ensure **TRUST** in data transactions	Public sector data, private sector data and personal data voluntarily made available by data holders
Regulate **MARKET POWER** based on data	Personal data and private sector data held by online platforms and originating from the users (both businesses and individuals)
Unleash the socio-economic potential of data as a raw material for **INNOVATION**, in particular **SMEs**	Public sector data of high value
Ensure **FAIRNESS** in the allocation of data value among the actors of the data economy	Private sector data, personal data and co-generated (IoT) data

Aim



- DA Data Act
- DMA Digital Markets Act
- DGA Data Governance Act
- ODD Open Data Directive
- FFoD Free Flow of Data Regulation
- GDPR General Data Protection Regulation

GDPR and FFoD ensure data protection and free flow of data across the board

For the processing of personal data, GDPR *always* applies

GDPR

FFoD

Data localisation requirements in the Union, introduces basis of CoC for cloud service providers

Legend

European Commission

Data Governance Act

The Data Governance Act will increase trust in data sharing and lower transaction costs by:

- regulating neutral data intermediaries, essentially the orchestrators that bring those who have the data and those who want to use it of data together;
- putting in place requirements for the secure re-use of protected publicly held data;
- providing a framework for data altruism organisations in order to facilitate data sharing for the common good
- setting up the European Data Innovation Board, in the form of an expert group for the data economy, that will foster the emergence of standards for cross-sector interoperability.

Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on European data governance (Data Governance Act) - COM/2020/767 final

Re-use of categories of protected public data

- **Complementary** to **Open Data Directive** (last revised 2019):

  Shall cover data that can only be **used under certain conditions**, because others have rights on that data (personal data, trade secrets, confidential business information, IP)

- Building on national access regimes: where re-use happens, it should do so in a harmonised manner, **subject to conditions**

- Leaves room for MS, but aims to **create at least one contact point (single information point)** for liaison between re-users and public sector bodies/competent bodies

EVIDENCE: More than 75% of stakeholders considered that public authorities should make a broader range of sensitive data available for R&I purposes for the public interest

European Data Innovation Board

- **Advising and assisting** the Commission in developing a consistent practice for re-use, data intermediaries and data altruism entities;
- **Governance of technical standardisation** to enhance interoperability;
- **Facilitating the cooperation of the work of national competent authorities** for enhanced data use.

EVIDENCE:

91% of respondents consider that standardisation is necessary to improve interoperability and ultimately data re-use across sectors.
83,3% consider public authorities should play a role in standardisation (funding to open standards and for testing, prioritisation and coordination of standardisation).

European Commission

Data Act: Scope of rights and obligations

Better access to IoT data

Manufacturers of IoT objects need to allow access & can use the data

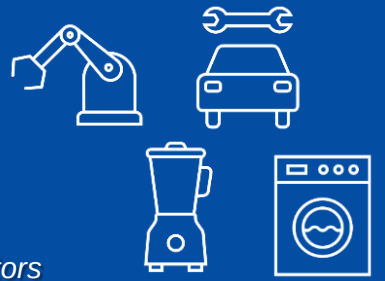
↓

Users of IoT objects get right to access and port data

↓

3rd parties can use the data to offer services (SMEs get special conditions)

Rules for IoT data also frame data sharing in other sectors



Tackle contractual unfairness

Companies are prohibited from unilaterally imposing unfair contractual clauses related to data sharing on SMEs

Make business data available for the common good

Companies must make data available to public sector bodies in case of emergencies and other exceptional needs

Easier switching between cloud services

Cloud service providers must ensure easy switching conditions for customers

Facilitate data flows through technical standards and interoperability

The European Commission may adopt technical specifications if necessary to ensure interoperability

Proportionate, limited and predictable business-to-government rules

Data is requested based on an <u>exceptional need:</u>

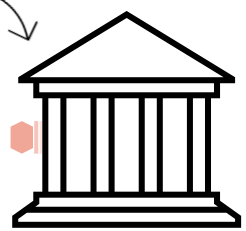
a) to respond to a public emergency (*free*)

b) to prevent or to address the aftermath of a public emergency (*cost + margin*)

c) for other exceptional needs (*cost + margin*)

Public sector body must demonstrate the exceptional need

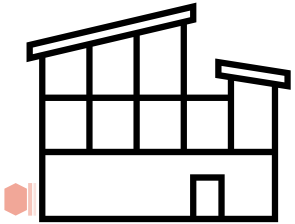
Data is destroyed after use



Public sector body

Public sector body requests data based on an exceptional need

Private sector body makes data available



Private sector

Private sector will benefit from streamlined procedures and from the "once-only principle"

Existing and future [compliance, reporting] sectoral obligations (incl. for law enforcement purposes) continue to apply

Public sector body
or
Union institution, agency or body

If request is valid, data must be made available

European Commission

Open Data directive (2019/1024 of 20/6/2019) Implementing Act : list of high value datasets

- ***Geospatial***
- ***Earth observation and environment***
- ***Meteorological***
- ***Statistics***
- ***Companies and company ownership***
- ***Mobility***

- Datasets listed in the implementing act to be made available:
  - for free
  - in machine-readable formats
  - via APIs and (where relevant) as bulk downloads

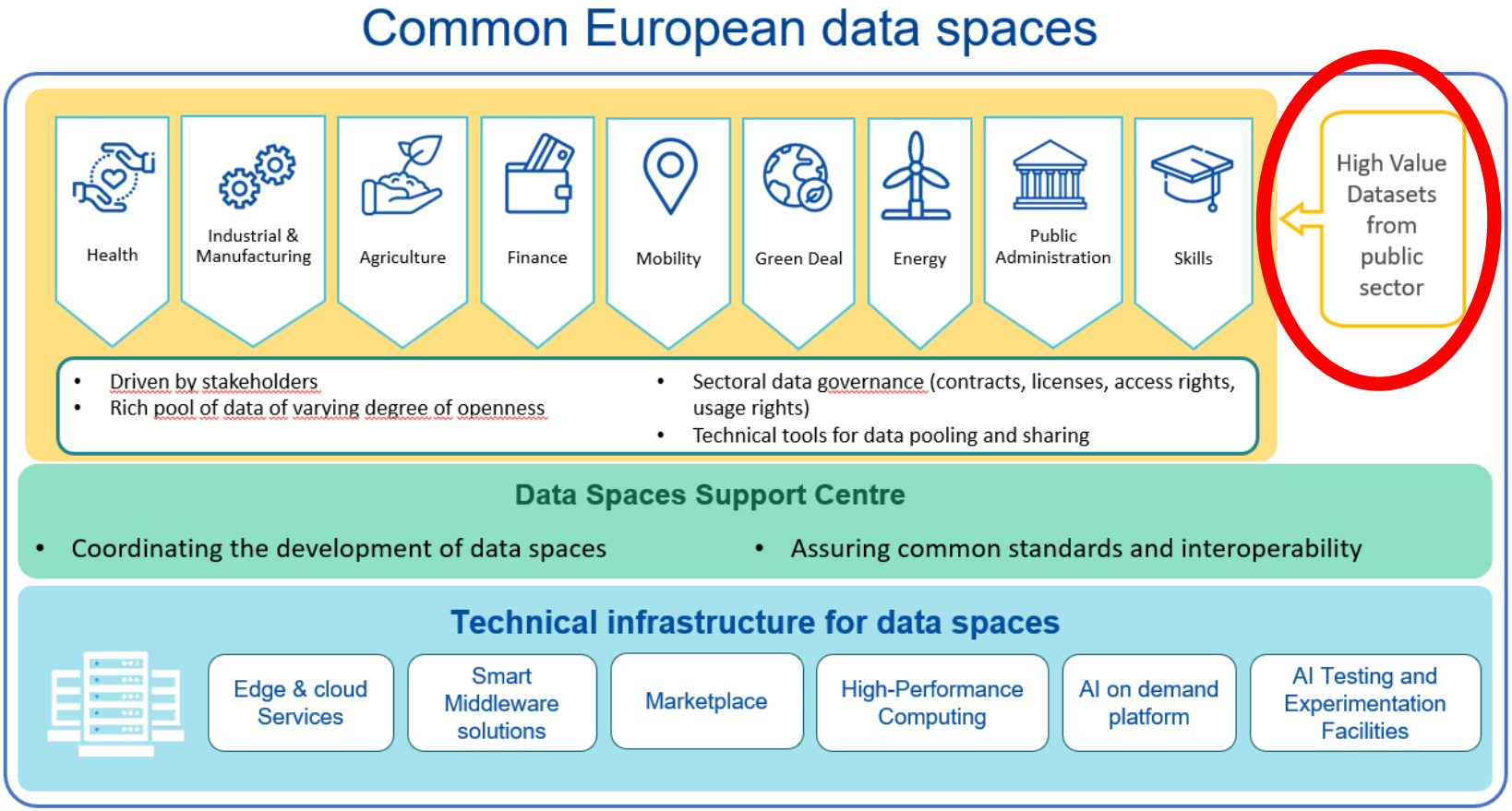
- Impact Assessment positive opinion
- Expected adoption: Q2/2022

European Commission

Geospatial – preliminary draft Implementing Regulation

Datasets	Administrative units	Geographical Names	Addresses	Buildings	Cadastral parcels	Agricultural parcels and livestock
Granularity	All generalisation levels available up to the level of scale 1:5000. From municipalities to countries; sea-frontiers.	N/A	N/A	All generalisation levels available up to the level of scale 1:5000.	All generalisation levels available up to the level of scale 1:5000.	Equivalent to 1:5000 as referred to in Article 70(1) of the Regulation (EU) 1306/2013
Geographical coverage	National or partial (i.e. covering the entire country when combined).	National or partial (i.e. covering the entire country when combined).	National or partial (i.e. covering the entire country when combined).	National or partial (i.e. covering the entire country when combined).	National or partial (i.e. covering the entire country when combined).	National (if regional design is applied, the addition of regions should cover the entire country).
Key attributes	Unique identifier; Geometry; Latitude and longitude; Boundary; National identification code; identification code of the upper administrative level; official name; country code; name in multiple languages (only for countries with more than one official language).	Unique identifier; Geometry; Name; name in multiple languages (only for countries with more than one official language); category; latitude and longitude (as per INSPIRE specifications)	Unique identifier; Geometry; Latitude and longitude; address locator (e.g. house number); thoroughfare (street); name; administrative units (e.g. municipality; province, country; postal descriptor (e.g. post code); date of last update.	Unique identifier; Geometry/Footprint of the building; floors; type of use.	Unique identifier; Geometry (boundary) of cadastral parcels; type of parcel; parcel code; references to the administrative area to which the parcel belongs.	Reference parcels as defined by Commission Delegated Regulation (EU) 640/2014); Agricultural area ('land cover') as referred to in article 4(1)(e) of Regulation (EU) No 1307/2013; Agricultural parcels ('land use') as referred to in Article 67(4)(a) of Regulation (EU) 1306/2013 and Article 5(2) of Commission Delegated Regulation (EU) 640/2014; Geometry and land use of agricultural parcels as referred to in Article 14(d) of Commission Delegated Regulation (EU) 809/2014; crop groups associated as referred to in Article 17 of Commission Delegated Regulation (EU) 640/2014; Landscape features and trees as referred to in Article 9(1) of Commission delegated Regulation (EU) 640/2014; Type of animals and number of each type of animals (Article 21c of Commission Delegated Regulation (EU) 809/2014

High Value Datasets and Data Spaces

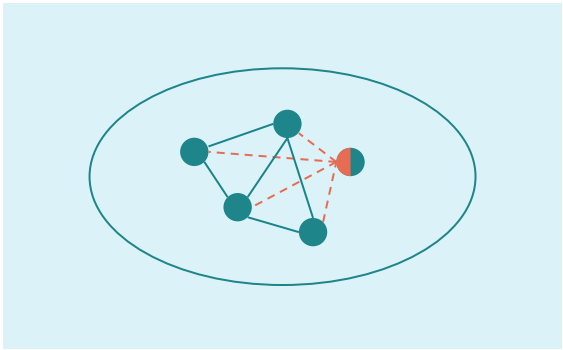


Key characteristics of a *data space*

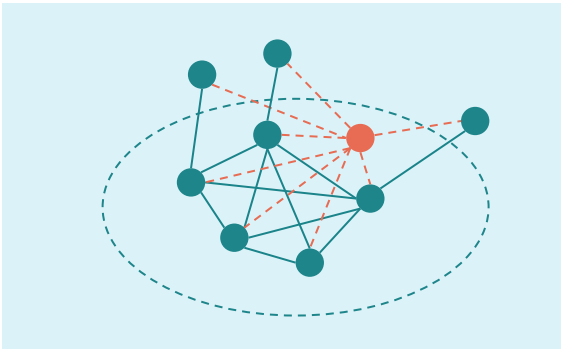
- A secure and privacy-preserving IT infrastructure to pool, access, process, use and share data.
- A data governance mechanism, comprising a set of rules of legislative, administrative and contractual nature that determine the rights to access, process, use and share data in a trustful and transparent manner.
- Data holders are in control of who can have access to their data, for which purpose and under which conditions it can be used.
- Presence of vast amounts of data that are made available on a voluntary basis and can be reused against remuneration or for free, depending on the data holder’s decision.
- Participation by an open number of organisations/individuals.

Evolution of data spaces

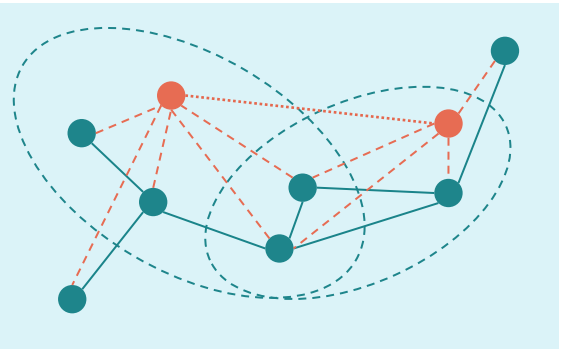
I Closed ecosystem



II Open ecosystem



III Federation of ecosystems



Legend:

Roles: Participant (Data Provider | Data User); Data intermediary.

Data Exchanges: Payload data incl. metadata between participants; Metadata between participant and federator; Metadata between federators.

Ecosystems: Closed; Open.

European Commission

Digital Europe Programme call for proposals on High Value Datasets

Opening date	22 February 2022	**Deadline date**	17 May 2022 17:00:00 Brussels time

Type of action	Simple grant (50% co-funding rate)
Indicative Budget	EUR 20 million
Indicative time of call opening	Second call
Indicative duration of the action	24-36 months
Indicative budget per Grant (EU contribution)	EUR 5-6 million
Implementation	European Commission
Security	Call restricted on the basis of article 12(6) of the Digital Europe Programme Regulation

European Commission

Public Sector Open Data for AI

What are we looking for?

Increase the easy availability, quality and usability of public sector information in compliance with the requirement of the Open Data Directive , in order to boost the re-use and combination of open public data across the EU for the development of information products and services, including AI applications

European Commission

Public Sector Open Data for AI

What are we looking for?

Support public administrations at local, regional and national level in increasing semantic, technical and legal interoperability and data portability of the High Value Datasets (HVDs):

- **Geospatial**
- Earth observation and environment
- Meteorological
- Statistics
- Companies and company ownership
- Mobility

European Commission

Conclusions

- Approche horizontale sur la stratégie données de la Commission (donnée géographique « cross-domain »)
- Génération de richesses (publiques et privées) à partir des données publiques
- Espaces européens de données et interopérabilité
- Besoin de clarté sur le marché européen de la donnée
- Quelques spécificités des données géographiques : marché de données transfrontalier (cross-border), l’un des six domaines des données de forte valeur (high value datasets).

Merci de votre attention!

Quelques liens utiles:

European Commission's policies on the reuse of public sector information

A European Strategy for data

Data Governance Act

Data Act

Digital Europe Programme

email: CNECT-G1@ec.europa.eu
Unit G1 of DG CONNECT

Des géodonnées paneuropéennes pour guider les politiques européennes

Julien GAFFURI
Eurostat - Service GISCO | Commission européenne

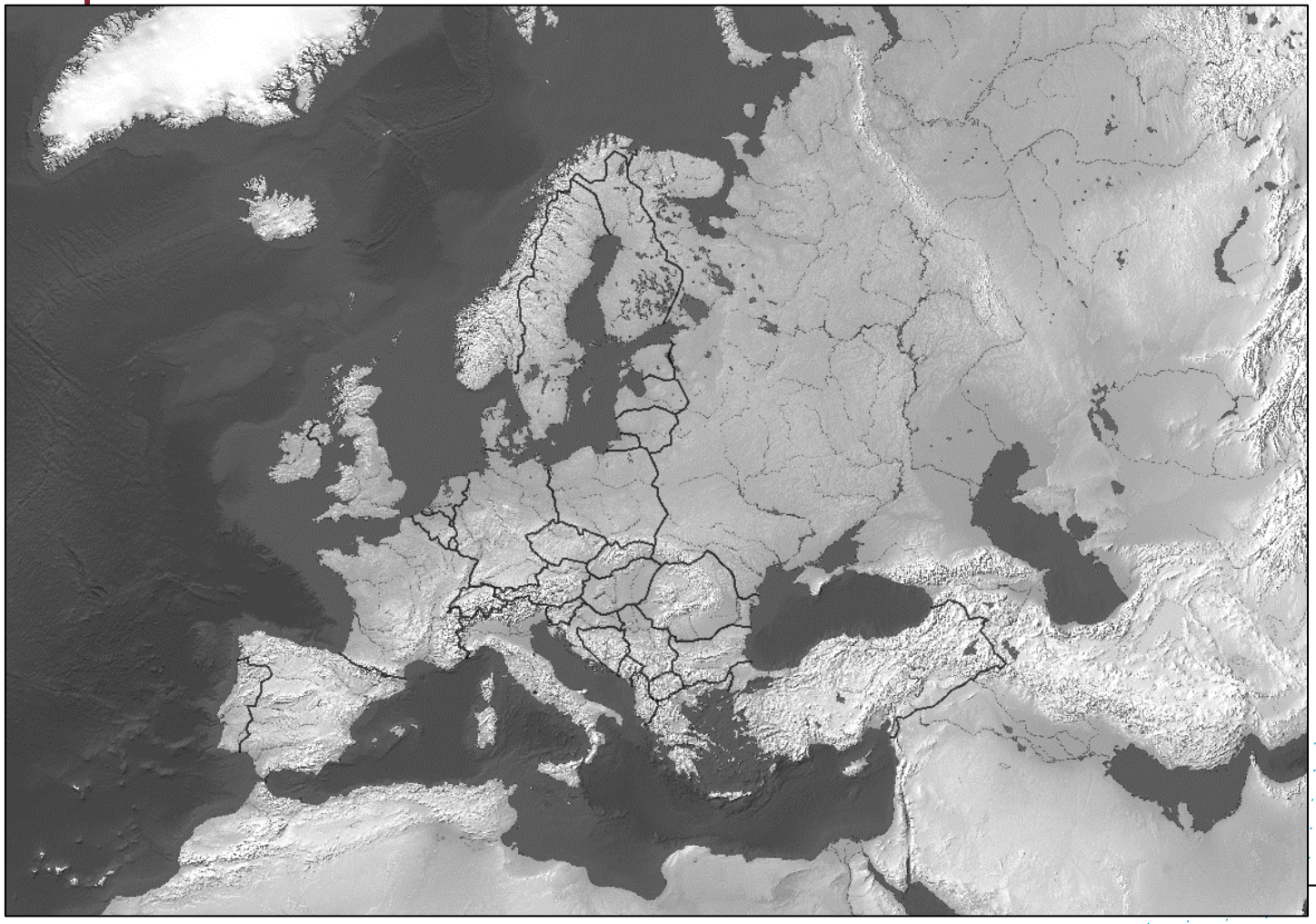
Exemples d'analyses spatiales pan-européennes

https://ec.europa.eu/regional_policy/en/newsroom/news/2019/01/01-03-2019-access-to-universities-in-the-eu-a-regional-and-territorial-analysis

https://ec.europa.eu/regional_policy/sources/docgener/focus/2013_09_passenger.pdf

Besoin

Données pan-européennes:
7 caractéristiques clefs.




Geo
Themes
Time
Gov & Res
Q
Scale
Lic

Thématiques

Idéalement: Domaines thématiques des politiques européennes.
Priorité: Domaines thématiques des « RGEs » européens existants.


BD-L-TC, ACT Luxembourg


ATKIS-DLM, BKG Germany


BDOT 10k, GUGiK Poland


BDTopo, IGN France

Etc…

Temps

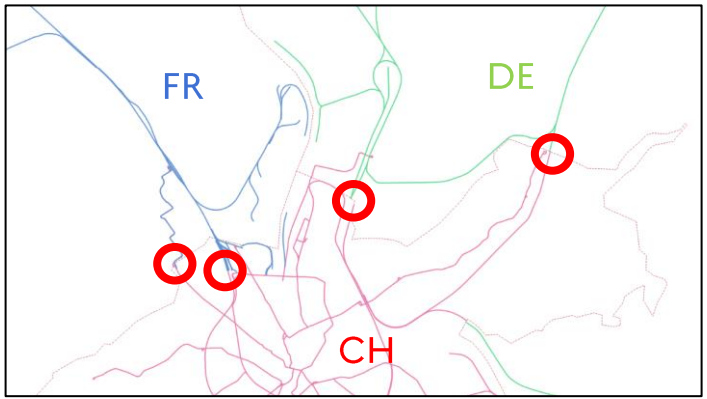
- Des données mises à jour rapidement et fréquemment
- Idéal: Mise à jour en continu
- Dissémination des mises à jour (jeux de données différentiels)
- Données historiques
- Pérennité de la source de données (calendrier de mise à jour, versionnement, identifiants, etc.)

Qualité

- Haut niveau de qualité/fiabilité.
  - Complétude (omission/complétion), exactitude de position, exactitude thématique/sémantique, cohérence topologique, homogénéité, comparabilité, temporalité, etc.
- Qualité connue et documentée.

Qualité – topologie

Raccords aux frontières (edge-matching)

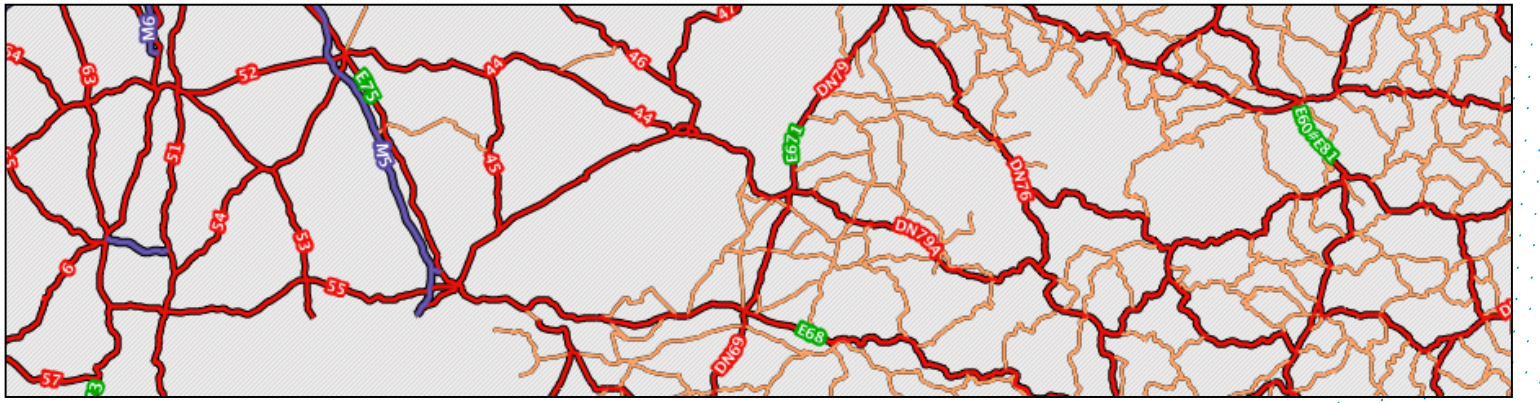


Frontière

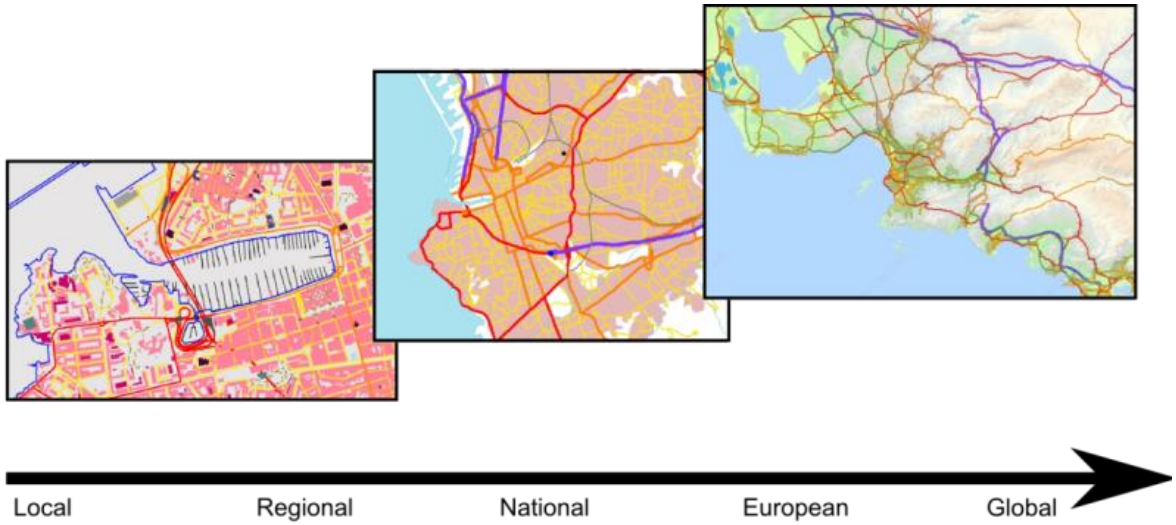
Connexion manquante

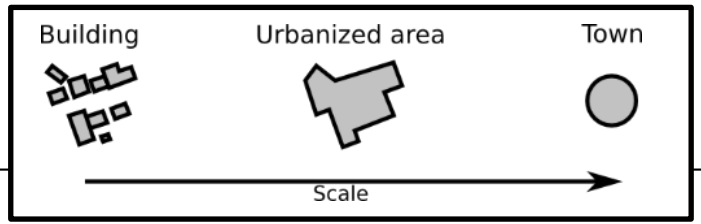
Qualité – comparabilité spatiale

Homogénéité de la qualité à travers l'espace



Données multi-échelles





Licenses

- Réduire les obstacles à l'utilisation des données
- Données initiales / données dérivées
- Idéal: Données ouvertes / géocommuns
- Minimum: Réutilisation interne aux institutions européennes

Gouvernance et ressources

- Nombreuses initiatives/réalisations, dont:
  - EuroGeographics et les produits EBM, ERM, EGM, EuroDEM, etc.
  - Spécifications UN-GGIM: Europe
- Besoin de compétences, outils, personnel, mandat, etc.
- Les jeux de géodonnées paneuropéennes, c'est compliqué à produire !
- Analogie avec Eurostat et la statistique officielle, FISE.
- Vers un **IGN européen** ? Impératif de pérennité.
- Information géographique et souveraineté numérique européenne

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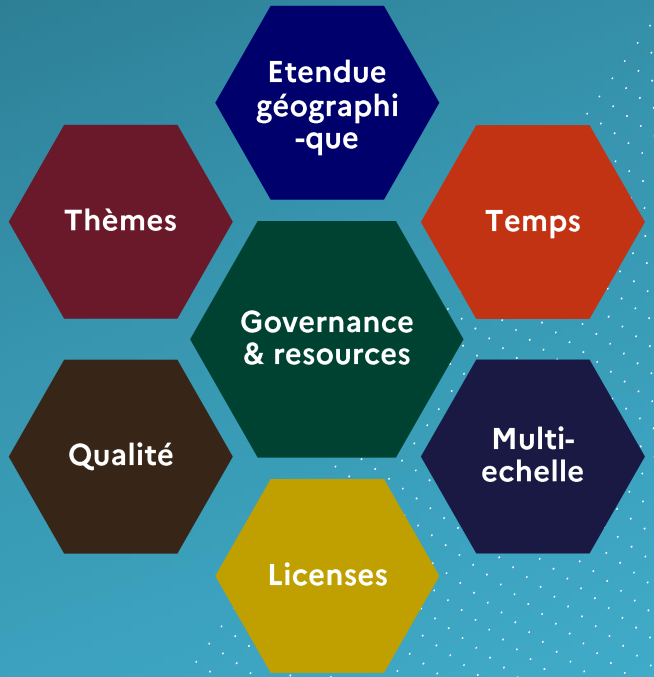
MERCI DE VOTRE ATTENTION



29 mars 2022

Quelles données paneuropéennes? Pour quels usages ?

Léa BODOSSIAN
Secrétaire générale et directrice exécutive | EuroGeographics

CONNECTING YOU TO MAPS, GEOSPATIAL AND LAND INFORMATION FOR EUROPE

eurogeographics

#MAPSFOREUROPE

60+ members from the whole of geographical Europe

EUROGEOGRAPHICS ACTIVITIES

Well-established network for sharing knowledge, expertise and access to data

- Sharing experiences and best practice
- Representing our members interests
- Fostering use and re-use of public sector geo-information

MAPS, CADASTRE, AND MORE

Our members provide data to help protect people, the planet and so much more

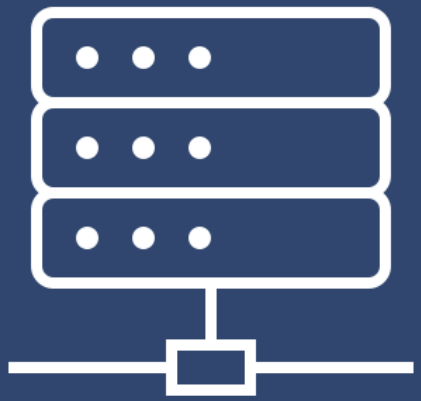
- Environmental monitoring & management
- Real-time data for pandemic response
- Smarter, sustainable agriculture
- Cleaner, safer, intelligent transport
- Emergency responses
- Aerial survey

TRUST & RELIABILITY

Our members empower society with trusted geospatial services

- Trusted daily everywhere for secure ownership transactions, diligent policy elaboration and monitoring
- Relied on by European institutions and UN, governments, businesses and citizens
- Registered on the EU Transparency Register and bound by its code of conduct

Données officielles (authoritative)



VISIBILITE

GUICHET UNIQUE

INTEROPERABILITE

Visibilité

- Webinaires
- Conférences
- ONU

Guichet Unique, un exemple: Agence Européenne de l'Environnement (EEA)

European Environment Agency

Countries

EEA member countries

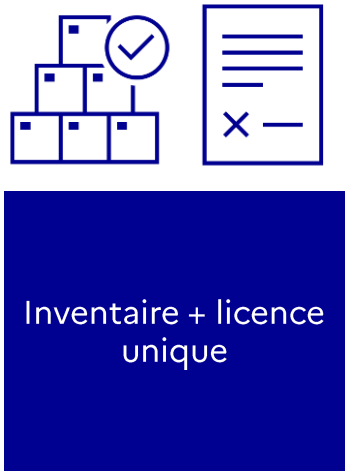
Austria
Belgium
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Italy
Latvia
Liechtenstein
Lithuania
Luxembourg
Malta
Netherlands
Norway
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden
Switzerland
Turkey

Cooperating countries

Albania
Bosnia and Herzegovina
Kosovo**
Montenegro
North Macedonia
Serbia

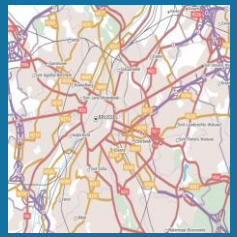
Former member country

United Kingdom*



Les bases de données pan européennes OFFICIELLES existantes

Ouverture des bases de données



EuroRegional Map

EuroGlobal Map

EuroDEM

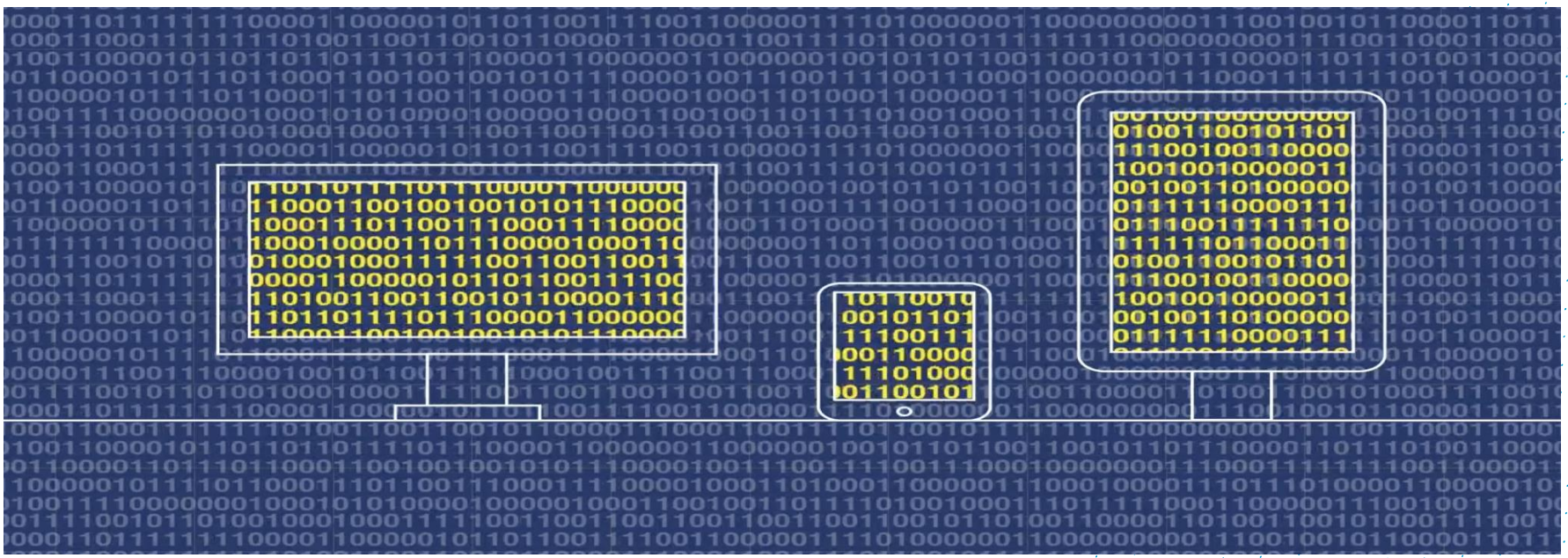
Gazetteer

Imagery

Cadastral Index Map

EuroBoundary Map

Interopérabilité?
Pourquoi est-ce unique, et difficile?



Quels usages, pour quels utilisateurs?

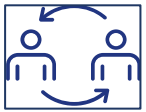
Elaboration de politiques

Suivi et mise en oeuvre des politiques

Besoins statistiques

Surveillance

Les utilisateurs veulent …

	Grande échelle	Des informations de + en + précises
	Interopérabilité	Les frontières ne doivent pas freiner l'analyse
	Harmonisation	Une vue globale du territoire européen
	Fréquences des mises à jour	Un accéleration des cadences
	Agilité	Des données de + en + diverses

Prédire l'imprévisible : un momentum pour la geodata…

- Gestion des zones sensibles (natura 2000)
- Smart cities
- Pesticides et maladies
- Energies renouvelables
- Optimisation des réseaux de transport
- Développer le transport intelligent
- Gestion et suivi des catastrophes
- Evolution des sols
- Suivi des cultures & récoltes
- Gestion et suivi des maladies
- Nouveaux usages
- Corridors humanitaires
- Résilience climatique
- Green Tech, Green finance…
- …

Une ambition réaliste




Techniques → Rapidité → Ouverture → Financiers

Agrégation de données techniques à l'échelle européenne au service de l'efficacité énergétique

Emmanuel BLANCHET
Co-fondateur, COO | Deepki

29 mars 2022

Deepki | IGN/PFUE - Vers des géodonnées européennes ?

Emmanuel Blanchet - COO & Co-founder

Deepki in a nutshell

1 Team 100% dedicated to making you succeed +150 people

38+ Countries where we operate

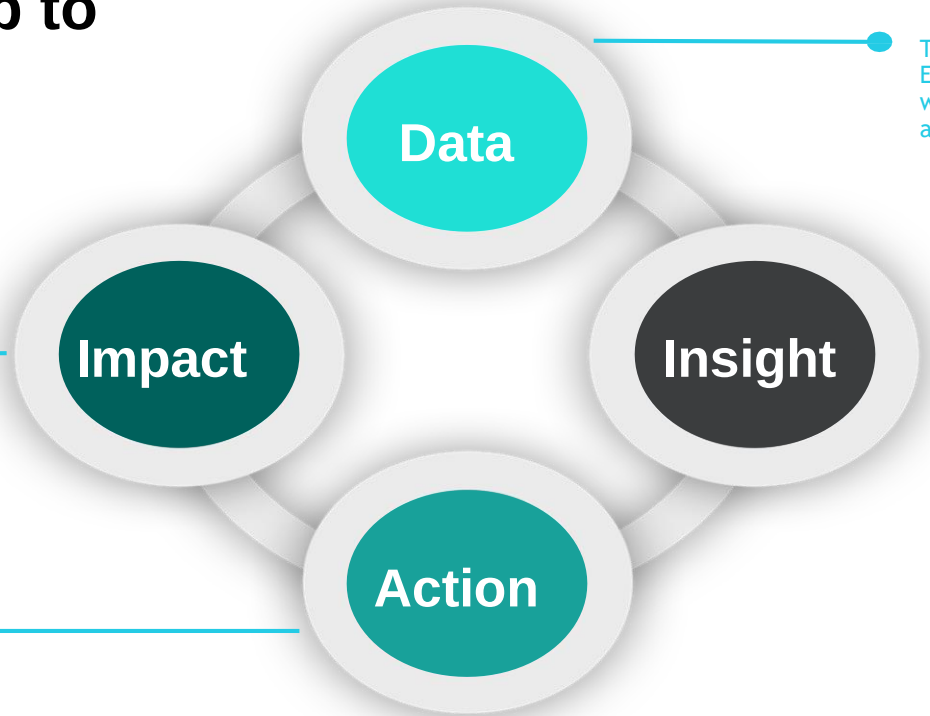
5 Offices (France, Spain, Italy, UK and Germany)

250+ Satisfied clients who continue to work with us

400M+ sqm monitored

180K teqCO_2 savings detected

The roadmap to net zero



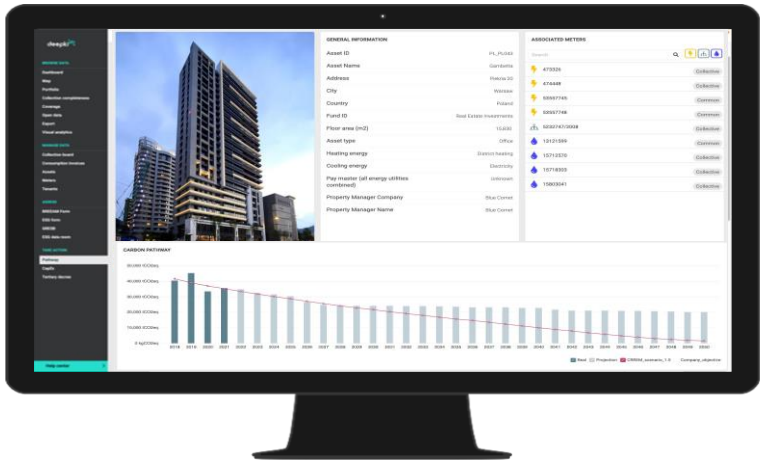
The path to managing your ESG performance begins with data collection across all assets in to one platform.

Transform the data into insights that inform the strategy, reporting and delivery of your esg targets, providing performance analysis of your entire portfolio.

Put in to place your action plan and communicate your progress to your shareholders, investors and clients.

Manage your journey to net zero with confidence by having complete visibility of your pathway and recommendations to ensure you achieve your ESG goals.

The roadmap to net zero



Use trajectory features to show the likelihood of hitting your ESG commitments in the future, enabling you to manage your assets and your stakeholders to protect the value of your fund.

Deepki, leading the way in ESG for real estate owners and accelerating transition towards net zero and sustainability.

Emmanuel Blanchet
COO & Cofounder
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deepki

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CHANGER D'ÉCHELLE

TABLE-RONDE 2 :

Géodonnées paneuropéennes : Quelles opportunités de coopération et d'ouverture ?

29 mars 2022

Expériences d'harmonisation et solutions à apporter - Le cas de l'IGN Belgique

Nathalie DELATTRE

Cheffe de projet SIG et responsable du programme INSPIRE | IGN Belgique

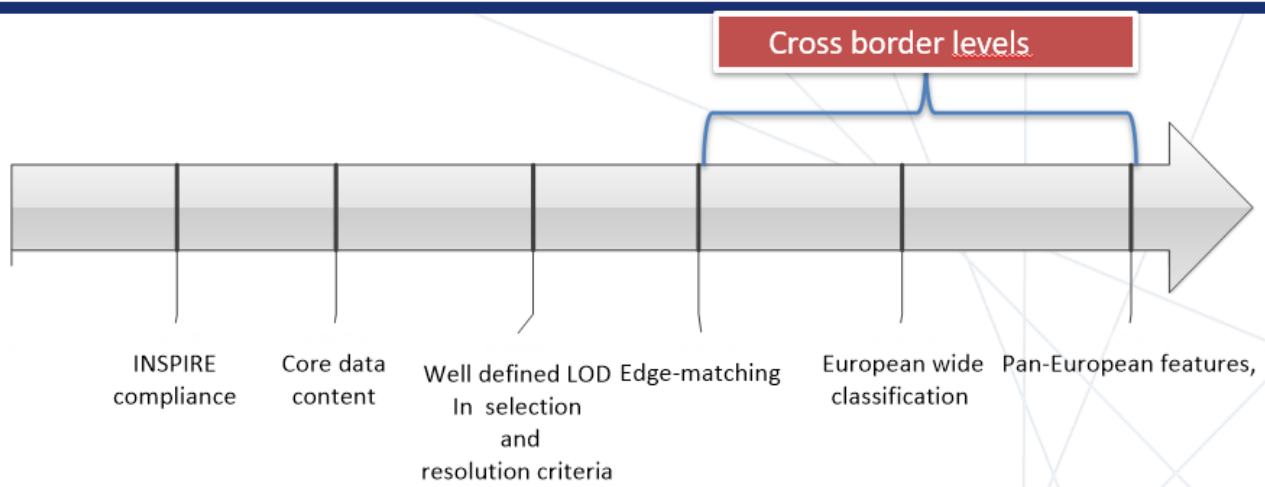
produits EuroGeographics: EuroRegionaMap, EuroBoudaryMap

projets ESDIN, ELF: établissement des règles et des spécifications

Les principes de base de l'harmonisation

Projet: European Location Framework (ELF) 2013-2016.

Degrees of interoperability of the ELF datasets



- This graduated scale indicates a step by step approach to achieve the highest degree of interoperability.
- All these steps should finally be described in the ELF data specifications

Gestion des raccords selon ELF

Des spécifications existent, modèle de données & outil : ArcGis

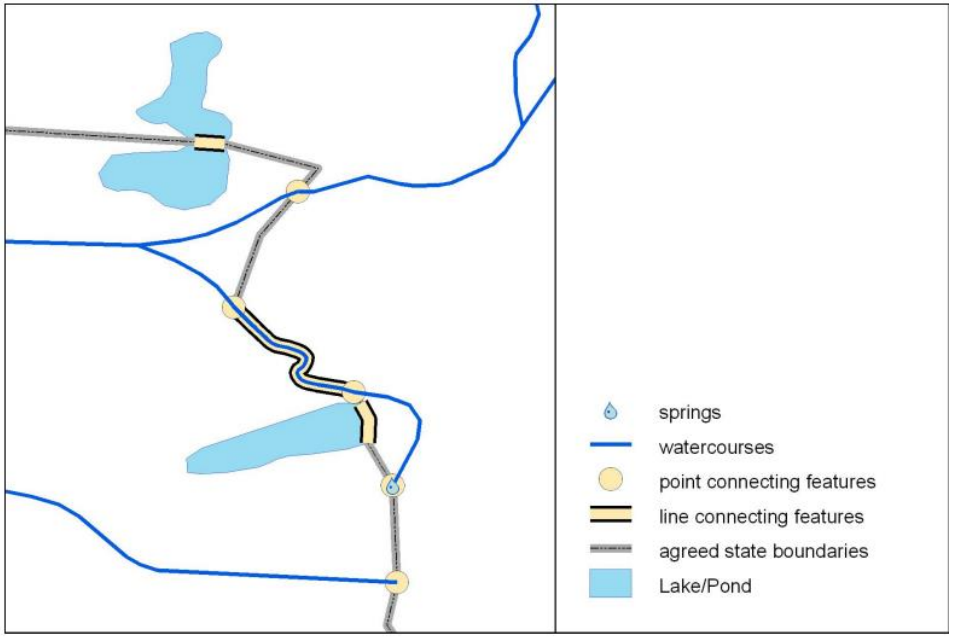


Figure 9 - Example of national hydrographic objects linked to connecting features on a state boundary.

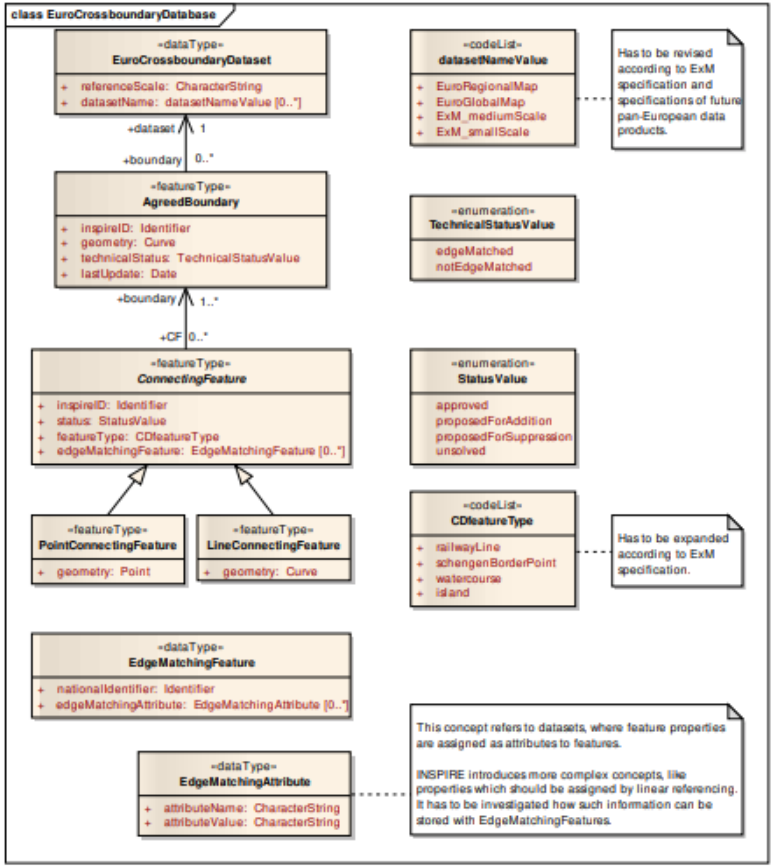


Figure 10 – Conceptual model of the Euro Cross-boundary Data Base (EXDB).

Qu'en est-il de leur application?

Dans le cadre de la Directive INSPIRE

INSPIRE

Directive 2007/2/EC ; Chapter III Article 10 paragraph 2

Afin de garantir la cohérence des données géographiques concernant un élément géographique qui englobe la frontière entre deux États membres ou plus, les États membres décident d'un commun accord, le cas échéant, de la représentation et de la position de ces éléments communs

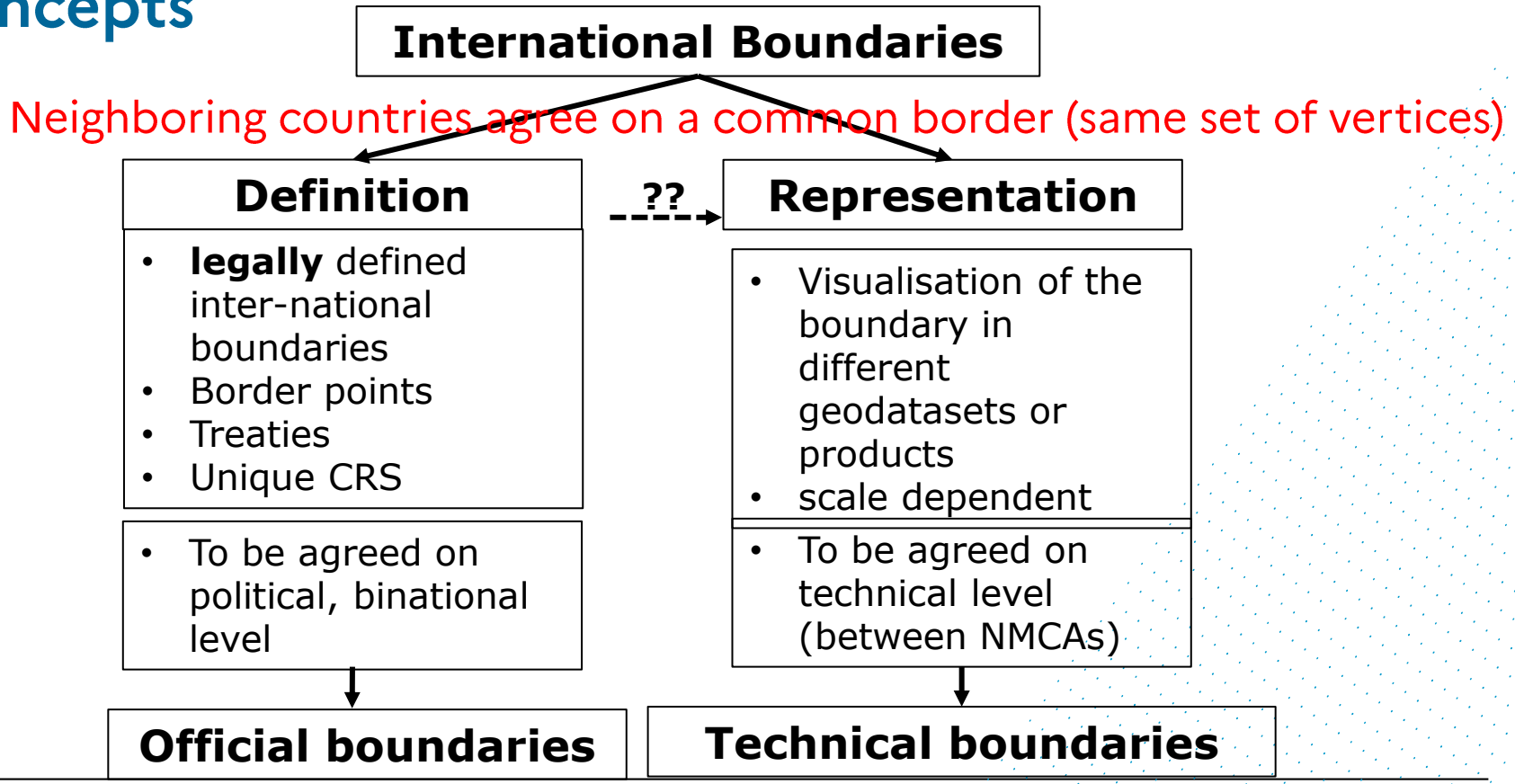
IR Requirement Annex I, Section 7.9.1 for TN and Section 8.7.1 for HY

Theme-specific Requirements – Consistency between spatial data sets Connectivity between ….Networks across state borders and – where applicable – also across regional borders (and data sets) within Member States shall be established and maintained by the respective authorities, using the cross-border connectivity mechanisms provided by the **NetworkConnection type.**

TG: D 2.6, Methodology for the development of data specifications" Annex B

Management of connections at international boundaries

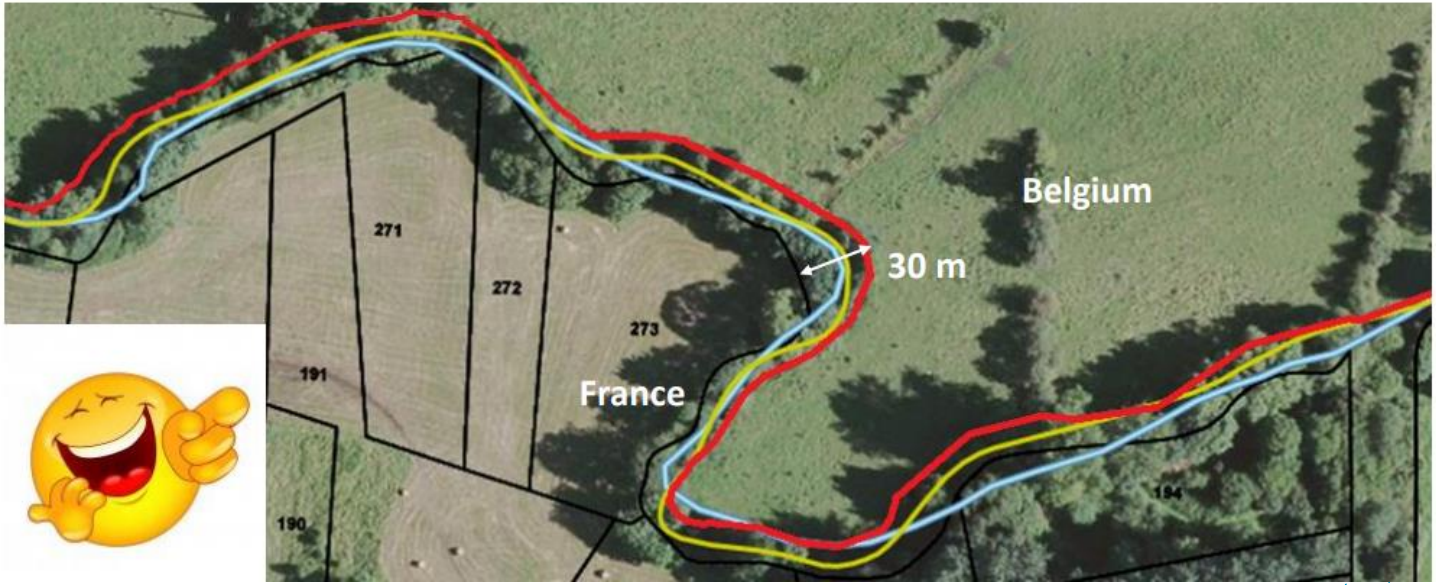
2 concepts


International Boundaries
Neighboring countries agree on a common border (same set of vertices)
Definition
??
Representation
• legally defined inter-national boundaries
• Border points
• Treaties
• Unique CRS
• Visualisation of the boundary in different geodatasets or products
• scale dependent
• To be agreed on political, binational level
• To be agreed on technical level (between NMCAs)
Official boundaries
Technical boundaries

Expériences de raccords aux frontières sur les données socle

1.1 Common boundaries, you mean?

1. The meaninfullness

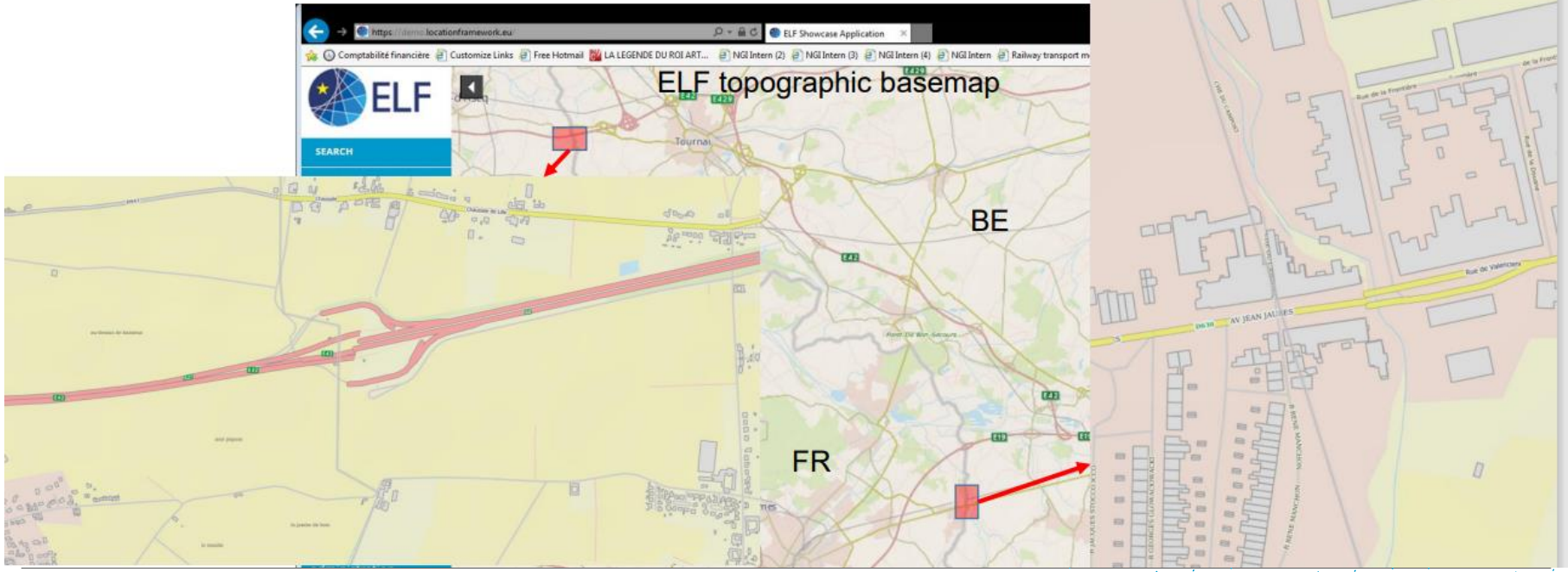


National boundaries
(Cadastral Agencies)
Belgium
France

River boundaries
(Mapping Agencies)
Belgium
France

1.2 Cross-border digital data, you mean?

1. The meaninfullness

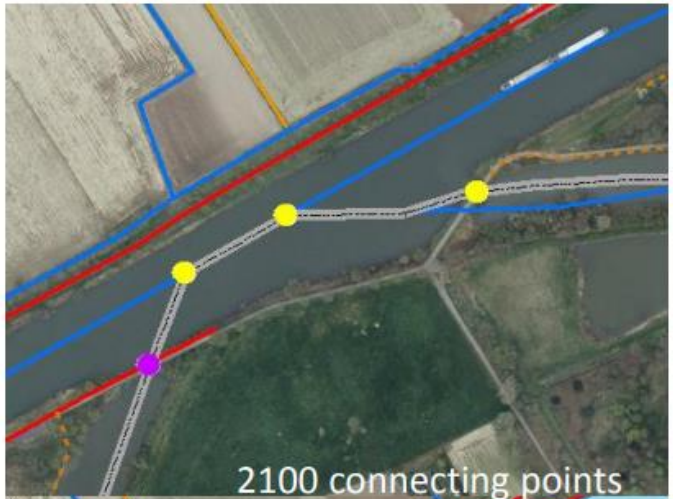


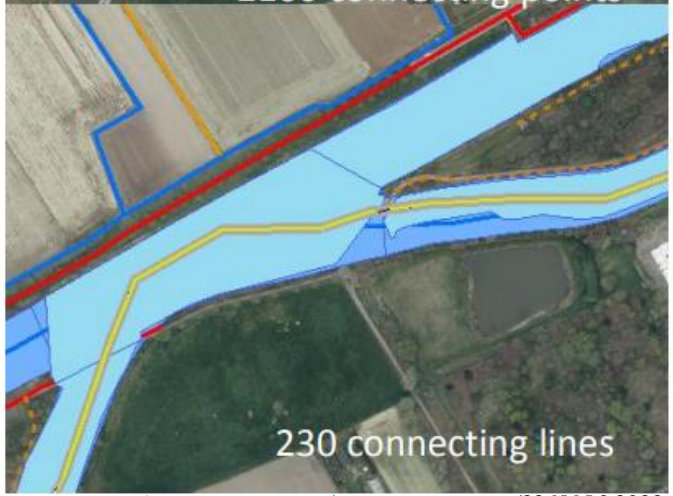
Résultat

Limite administrative technique

Connexion réseau hydrographique (2100 CP, 230 CL)

Connexion réseau de transport





Quelles leçons à retirer des raccords sur les données socle

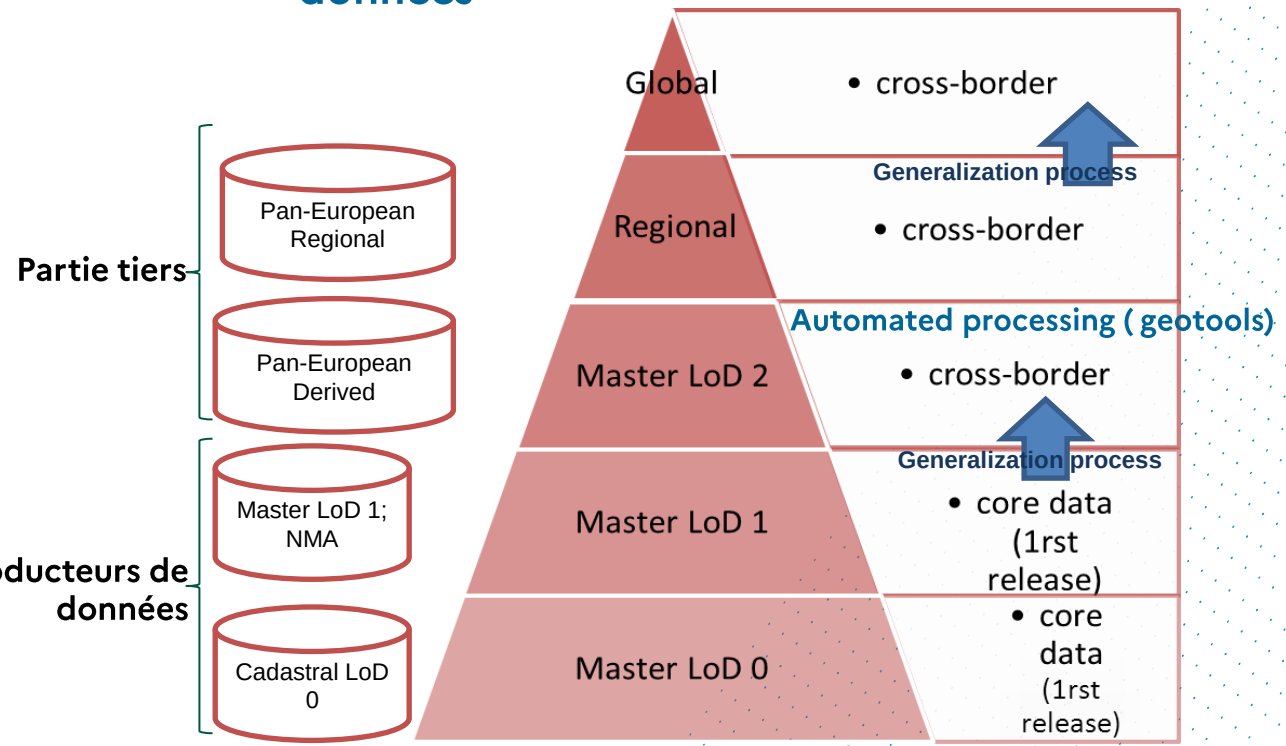
Solutions à moyen et à long terme

Harmonisation moyen terme

Etablissement de la base de données : Limites techniques et objets de connexion

Edge-matching and change only update on derived datasets (central database), maintained at that level.

ELF: degré d'harmonisation des jeux de données



Harmonisation long terme

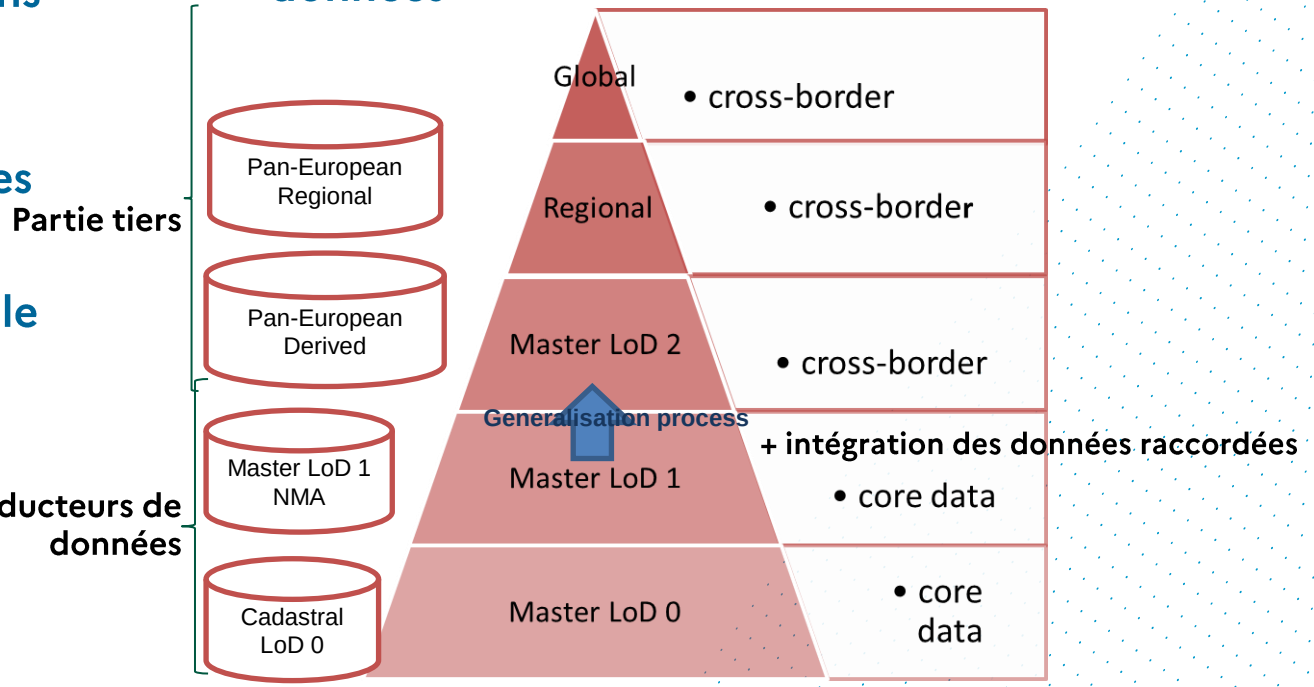
Integration des raccords dans les données souches

Gestion centralisée des limites administratives et des données de raccord.

Coordination supra-nationale

Harmonisation part de la stratégie des agences

ELF: degré d'harmonisation des jeux de données

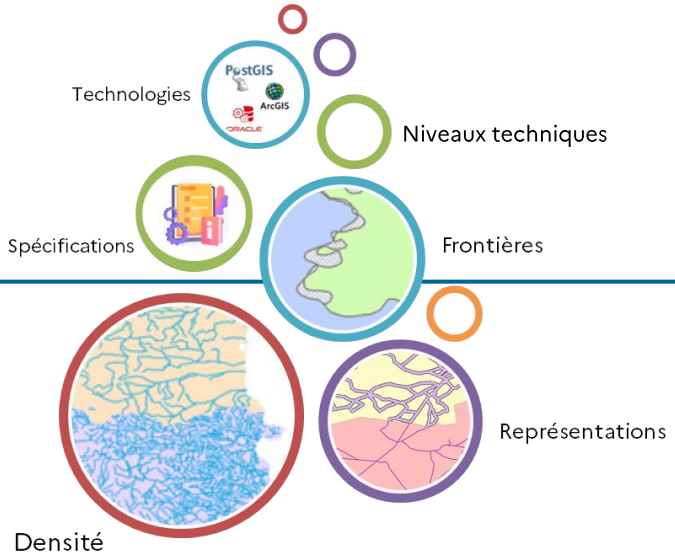


Harmonisation « pratique » : des solutions techniques pour co-construire des données paneuropéennes harmonisées

Noémie GRÉMEAUX
Cheffe de projet développement d'outils collaboratifs | IGN France

Contexte et défis techniques à relever

Des **agences de cartographie** qui produisent des **données de référence** sur leur territoire national pour répondre à leur propres **besoins** et avec leurs propres **contraintes**



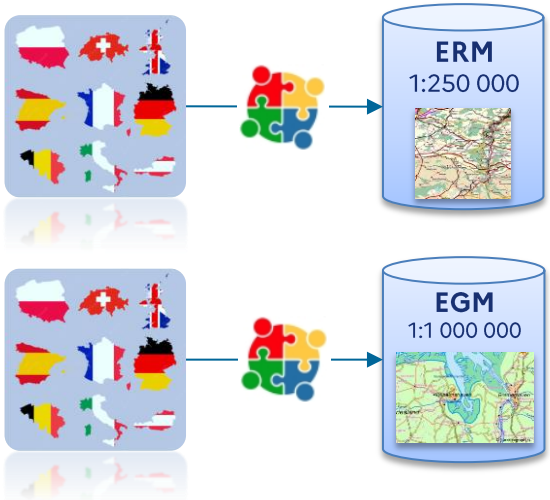
eurogeographics

Mais qui essaient de travailler **ensemble** pour produire des **données harmonisées**

Ex : EuroBoundaryMap (EBM), EuroRegionalMap (ERM)

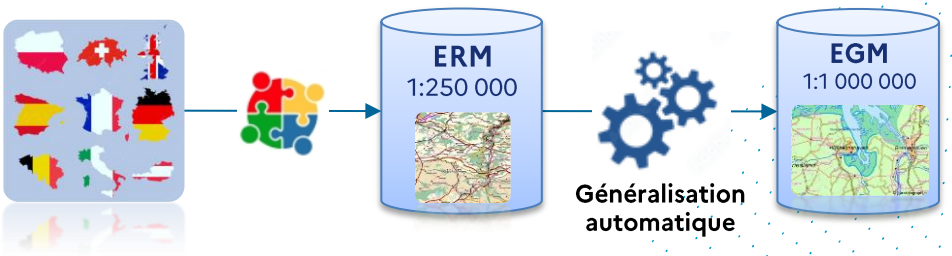
Exemple de réalisation : production de données harmonisées au 1:1 000 000 par généralisation automatique centralisée (2014-2016)

Avant



Production séparée de 2 bases avec duplication du travail d'harmonisation

Aujourd'hui

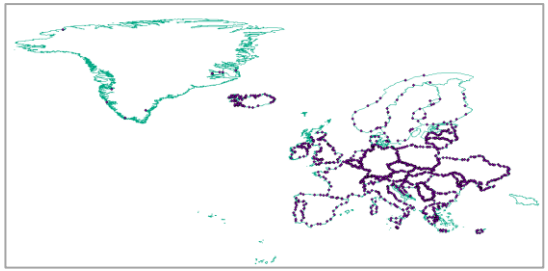


- Projet coordonné par EuroGeographics et réalisé par l'IGN France.
- Co-financé par des fonds européens (projets ESDIN puis E.L.F).
- Capitalisation sur des travaux de recherche et sur l'expérience de quelques instituts européens.

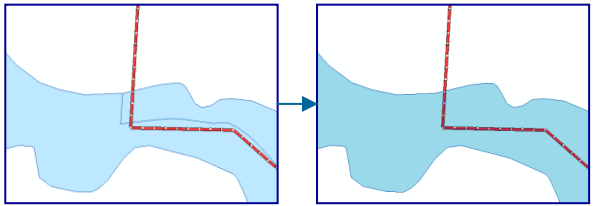
Exemple de réalisation : production de données harmonisées au 1:1 000 000 par généralisation automatique centralisée (2014-2016)

Les constats

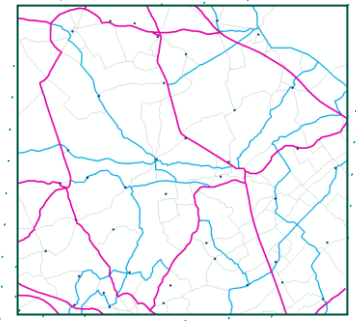
- Réel défi technique à l'époque
- Amélioration du travail d'harmonisation réalisé à moyenne échelle : raccords, densité…
- Harmonisation des données entre échelles
- Briques réutilisables
- Moins d'enjeux donc plus de liberté à de telles échelles
- Importance du pilotage centralisé et du financement européen



Utilisation d'objets de raccord (ELF)



Plaquage automatique des géométries aux frontières



Application de critères de sélection « évolués » pour une densité homogène

En 2022, passons à la grande échelle…

Des attentes de plus en plus fortes pour des données paneuropéennes harmonisées à grande échelle

- Un contexte qui a évolué :
  - Données nationales plus accessibles,
  - Nombreuses briques techniques disponibles,
  - Montée en compétence des instituts dans de nombreux domaines (production automatisée, services web, historisation, différentiels…).
  - ⇨ Levée de nombreux verrous techniques

- Ce qui n'a pas changé :
  - Manque de temps et de ressources chez les producteurs nationaux,
  - Besoin d'un « moteur » européen

Exemple de la BDUni IGN France :

Base de données contenant ~0,5 millions d'objets, accessible via une API et mise à disposition sur le web.

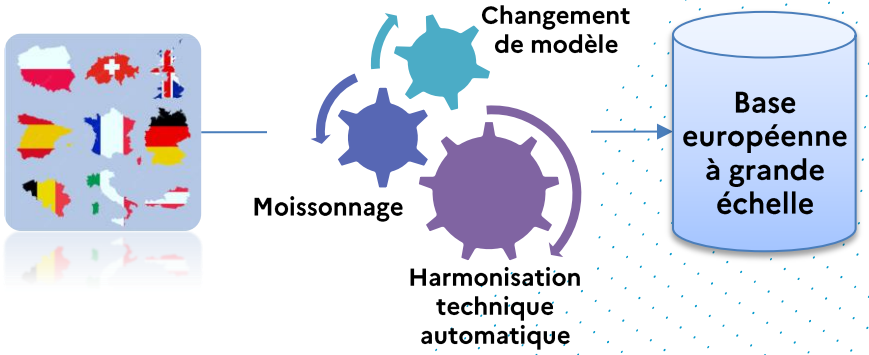
Mise à jour en continu, qui inclut par exemple du moissonnage, des raccords aux frontières et de la généralisation.

En 2022, passons à la grande échelle…

Comment capitaliser sur les expériences passées pour mettre en place une base européenne à grande échelle ?

Les clés de la réussite :

- Harmoniser de façon technique et pratique :
  - Modifier les données nationales,
  - Automatiser l'harmonisation au maximum, (raccords transfrontaliers notamment),
  - S'appuyer sur les instituts les plus « techniques ».
- Réduire la charge de travail des états membres une fois le processus en place,
- Mettre en place une coordination centralisée,
- Approche itérative : les solutions techniques ne sont probablement pas parfaites, mais elles permettent d'avancer.



Cartographie collaborative mondiale : modèle de fonctionnement et cas d'usage

Christian QUEST
Administrateur et porte-parole | OpenStreetMap France

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MERCI DE VOTRE ATTENTION

29 mars 2022