



**RÉPUBLIQUE
FRANÇAISE**

*Liberté
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IGN

INSTITUT NATIONAL
DE L'INFORMATION
GÉOGRAPHIQUE
ET FORESTIÈRE



IGN, scale up

Strategic Framework
2022

#IGNScaleUp



Reinventing the IGN public service

Few public services have, like IGN, gone through such profound changes in their *raison d'être*. Inherited from the *Dépôt de la Guerre* (France's military archive and cartography department) in 1688, IGN, which became civilian 80 years ago, has helped to organise the development of the territory. But today, with GPS built into our watches, with phones that display atlases and aerial photos in a few clicks and swipes, one might wonder **what is the purpose of a public cartography institute.**

However, geographic data is everywhere: geolocation for a multitude of applications, immersive experiences, urban development plans, risk prevention plans, smart territories, etc. At the same time, knowledge of the territory has never been more necessary as our planet faces rapid and violent upheavals – floods, forest fires, rising waters, drought – **the Anthropocene poses a new challenge to cartography.**

Digital technology has made the use of the cartographic tools that can be used to rise to this challenge more widespread and opened up new perspectives. With automated processing with a power increased tenfold by artificial intelligence, immense storage capacities, and the cross-referencing of an ever-increasing quantity of data, we can now build real control stations for the phenomena occurring around us. This is also true for forests, which IGN monitors as part of the inventory it conducts each year.

IGN has deployed the GeoCommons approach, an open and interactive consultation with its ecosystem and its teams. Rather than a discourse of reform, it was a question of clarifying IGN's *raison d'être* and of affirming realistic and high-impact ambitions.

The new direction taken by IGN is to **give the Nation the tools to understand its territory at a time of major ecological and digital upheavals.** And for public mapping to become an instrument of empowerment in the face of these upheavals, it is necessary to commit to it not only *for* citizens and territories but also *with* them: it is these two inseparable dimensions that form the GeoCommons.

To give substance to this new impetus, ten emblematic but non-exhaustive projects within IGN's activity are highlighted. They revolve around three aspects that will henceforth drive IGN's action: continuous observation of the territory, participation in the digital commons, and being a companion and cartographer. IGN will set up regular meetings to report on the progress and completion of these projects.

A big thank you to everyone who has taken part in this process! It is up to us to come together to write a new page in the history of territorial representation.



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The 10 emblematic projects

To give substance to this new impetus, ten projects are highlighted. These are not exhaustive of IGN's activity, which will continue to produce "foundation" and inventory data, to lend a hand to the Ministry of the Armed Forces, and to invest in higher education, research, European and international work, and so on. These ten projects enhance some of the projects already under way, which are thus put into perspective.

Anthropocene maps

Regular publication (every one to three years) of maps on a limited number of major ecological issues, in particular (i) the strength of the forests, (ii) changes in relief and watercourses, (iii) land take, (iv) biodiversity potential, etc., as well as other topics to be defined in support of public policies; the maps can be enriched in thematic observatories with partners, for example on forests, and through meetings to share findings

A 3D model for the whole of France

A 3D model for the whole of France: high-density airborne Lidar acquisition 2021-2025, progressive availability of open data and work on the exploitation of this data with key sectors (cities, forests, agriculture, building, infrastructure, etc.)

A recruitment and training plan

A recruitment and training plan (AI, data science, 3D altimetry, geovisualisation, agile development, etc.) based on an attractiveness approach (salary policy, work environment, communication), as well as on IGN's National School of Geographic Sciences (ENSG-Géomatique); a managerial and human project for teams that play an active role in the Institute's ambitions

A "commons space"

A "commons space", equivalent to a marketplace for the commons, through (i) "calls to commons" to bring together interested players around collective challenges (already identified: street view, navigable road base), (ii) a GeoCommons Factory to develop these themes and other IGN projects with the ecosystem, and (iii) the Geoplatform, an infrastructure open to the commons and public players for hosting and sharing data

A labelling system for public partners


A labelling system for public partners or contributing communities authorised to independently enrich and update IGN's "BD France" database; authoritative data will continue to be guaranteed by one of the Institute's agents

**The
IGNfab forum**




An “IGNfab forum” for discussion with entrepreneurs in the sector and innovation and French Tech players to build shared visions and forge partnerships where appropriate; the current IGNfab support programme for start-ups remains and will be enriched with the forum’s support

**A smartphone
plan**




An alternative smartphone plan to Google and Apple that respects the wealth of the territory and the freedom of users, to be co-constructed in the GeoCommons Factory

**New paper
maps**




New paper maps to meet the expectations of French people (reconnection with nature, heritage, cycling, etc.) and more recent and accessible maps to scale 1:25,000

**The “public
service
cartographer”
desk**



A “public service cartographer” desk: establishment of a support service for all local or national authorities wishing to use maps as tools for mediation or coordination of public policies; this service will enhance the geovisualisation and hosting functionalities of the Geoplatform for authorities that want this

**Shared
cartography
programmes**



Sharing, scientific popularisation and citizen awareness programmes on the subject of cartography and the issues to which it can contribute, embodied by places: Musée des Arts et Métiers (heritage), Géoroom in Saint-Mandé (school groups, commons players) and IGN sites in the region



A new direction for IGN

A new business model

With the new establishment project launched in 2019, the recent signing of the 2020-2024 Objectives and Performance Contract (COP) and free data from 1 January 2021, IGN is reinventing its business model in the context of the rapid decline in its commercial revenues. IGN has notably refocused on the production of repositories for public partners and major projects in support of public policies (e.g. 3D model for the whole of France). To be completely successful, the supervisory authorities of the Ministry of the Ecological Transition, the Ministry of Agriculture and Food, and the Budget Department have made room for manoeuvre in terms of recruiting new skills.

A clarification exercise carried out in osmosis with the ecosystem of players

With the “GeoCommons” approach initiated in April 2021, the intention is to realign, within this new framework, the desires of the Institute’s teams to mobilise their know-how with, on the one hand, the long-term needs of the country in light of major contemporary issues and, on the other hand, the ability to mobilise an ecosystem of players that has expanded considerably with digital technology.

Christened “GeoCommons” to put cooperation at the heart of the matter, the exercise was based on a vast public consultation, which collected 165 contributions¹, and a series of internal debates. About fifty IGN agents, “the explorers”, also practised an immersive experience on the outside. Finally, a major seminar was held at the Cité Fertile (Pantin). The results of this work were presented on 24 November during an event at Ground Control (Paris).

Announcements after the clarification process

10 emblematic projects are highlighted to give substance to this new impetus, divided into 3 areas that structure the results of this clarification process:

- **IGN, continuous observer of the national territory:** the Institute will refocus and develop its production and development activities on mapping the Anthropocene;
- **IGN, a digital “commons” player:** in addition to its production activities, the Institute must fully play its role of bringing together stakeholders around challenges of common interest;
- **IGN, cartographer and companion of discoveries and representations:** digital technology multiplies the potential of maps as mediation tools; the Institute’s history and know-how, its scientific influence, and its paper and digital maps are to be mobilised to reach our fellow citizens, enrich their view of the territory and raise awareness among young people, directly and through a network of alliances to be forged (school groups, leisure and tourism, heritage, the map as a creative tool, etc.).

¹ >A summary of the public consultation is available at <https://www.ign.fr/concertation-publique-sur-les-geo-communs>

“IGN, scale up”, a new signature

Faced with environmental and informational risks and to avoid a gradual decline, it is necessary to be able to scale up, i.e. at the same time, observe closely to highlight complex changes and widen the focal point, zoom out to get an overview, and take a step back and help make decisions to build a shared future. It is this role that IGN wishes to play by becoming a stakeholder in a commitment made by the whole of society. To make this a reality, the Institute has adopted a new signature:

“IGN, scale up”

An ongoing process

The “GeoCommons” exercise launched in 2021 is only the first step in an ongoing process. In contact with its ecosystem and by implementing its first projects, the Institute will refine and develop its proposals and its methods of intervention through an iterative approach with a continuous feedback loop. A progress report will be produced in the summer of 2022.

The objectives set for IGN by the government

IGN has an Objectives and Performance Contract with the State for the period 2020-2024, which sets strategic guidelines to meet the expectations and challenges of the public authorities:

- develop appropriate support for public policies, in particular through the production or qualification of sovereign geographic and forest inventory data, within the framework of an advisory and partnership relationship with the leaders and beneficiaries of these policies;
- become a leading player in the intermediation of communities of users or producers of geolocated data, in particular through the implementation of an open and shared Geoplatform;
- make training, research and expertise the driver of IGN’s capacity for innovation and the lever for changing practices to meet the challenges of transforming public policies and society;
- anticipate IGN’s skills needs and continue to adapt its methods of action by driving changes in a socially and environmentally responsible manner, and by ensuring that a significant production capacity is maintained.

The ambitions deployed by the “GeoCommons” approach will feed into these objectives. They help to put into words the meaning that the Institute gives to its action and to underline the various projects that will work as a matrix of action for the future.



01.

IGN, continuous observer of the national territory

3 emblematic projects

Anthropocene maps

A 3D model for the whole of France

A recruitment and training plan



Experience and reach for the sky!

Climate change and its consequences for forests, biodiversity, ice melt, agricultural practices, urban sprawl, etc. call for continuous observation based on ever richer, updated and specific knowledge of the territory. A challenge for IGN, as “watchdog” for the territory and already invested in numerous cartographic programmes which partly meet these challenges.

Continuous observation of the territory is based on several political impulses, which set the conditions necessary for reconstructing IGN.

At European level, the Green Deal commits Member States to achieving carbon neutrality by 2050. More specifically, the forthcoming reform of the Common Agricultural Policy (CAP) imposes demanding conditions on farmers, which require increasingly precise observation of farms.

As an extension of the national biodiversity strategy² and the law for the recovery of biodiversity, nature and landscapes, the Biodiversity plan³ presented by the Government in July 2018 gives structure to the fight for the preservation and restoration of ecosystems. The Citizen’s Convention on Climate and, subsequently, the Climate and Resilience Law of 22 August 2021 introduced a target of net zero land take by 2050⁴ (with an initial objective of halving the rate of consumption of natural spaces by 2031).

Faced with the challenge of decarbonisation, the essential nature of forestry knowledge was highlighted by Anne-Laure Cattelot, a member of the French National Assembly, in her report submitted to the Government in September 2020 on forests and the timber industry.

In her report submitted to the Government in July 2018⁵, Valéria Faure-Muntian, member of the French National Assembly, also underlined the need for the State to have autonomous access to controlled geographic data in order to be able to carry out its missions in a sovereign manner, in other words to base its decisions and act autonomously in the

face of international players whose growing power resides in the mastery and exploitation of considerable quantities of data.

In this context, “the collection, acquisition, processing and provision of knowledge”⁶, in particular geographic data, have been recognised as essential tools for public decision-making. The National Geographic Information Council (CNIG) supports this initiative.

To respond to this dynamic, IGN has identified several challenges to be met in order to prevent and fight against climate and environmental disturbances:

- **Continuous observation capability** by mobilising research, new human resources, and alliances with industrialists and start-ups
- **Thematic maps:** to report on the rapid changes in the territory and the consequences on our environment
- **Tools that can be used by the players,** to bring the diagnosis closer to the field by spatialising statistical data, in particular in the field of forests, and to know how to react quickly in times of crisis by mobilising expert, agile skills (see box on IGN’s intervention during Storm Alex)
- **Shared diagnoses,** to transcend the variety of territories and perspectives and to take a similar course of action for a common goal
- **Engaged citizens** for a common understanding of the issues and better acceptability of the actions taken (protected areas, no-build areas, wind farms, etc.)

² <https://www.ecologie.gouv.fr/strategie-nationale-biodiversite>

³ <https://www.ecologie.gouv.fr/plan-biodiversite>

⁴ Article 192 of Law No. 2021-1104 of 22 August 2021 on the fight against climate change and strengthening resilience to its effects

⁵ <https://www.vie-publique.fr/sites/default/files/rapport/pdf/184000486.pdf>

⁶ Brigitte Baccaïni and Michel Ségard, report no. 013392-01 General Council for the Environment and Sustainable Development, “Optimisation of knowledge missions”, January 2021



Project 1 |

Observing rapid changes in the territory

>Anthropocene maps

Since IGN's creation as a civil institute in 1940 and even more so since the merger with the former IFN (National Forest Inventory) in 2012, the Institute has observed forests and territories as part of its mission to describe, from a geometric and physical point of view, the surface of the national territory and the use of its land. In accordance with the expectations of its supervisory bodies, the Ministry of the Ecological Transition and the Ministry of Agriculture and Food, IGN maintains high-quality multi-thematic databases. Organised in the form of interoperable repositories, this authoritative data describes the territory and the phenomena that occur there in order to feed into the definition, implementation or evaluation of public policies. As such, IGN is developing expertise on environmental themes.

Today, the ecological emergency pushes IGN to go further.

IGN will produce Anthropocene maps by regularly publishing (every one to three years) maps on a limited number of major ecological issues. In particular, IGN will report on the state of health of the forests, the erosion of the relief and changes to watercourses, land take, the potential for biodiversity and other themes to be defined in support of public policies.

This acceleration implies profound transformations. The IGN will in particular enrich the variety of information sources that it uses in a combined way (satellite observation, aerial shots, ground surveys, etc.). It will also extend the use of automatic processing technologies by artificial intelligence, technologies which have been adapted to the needs of environmental knowledge by the Institute's research laboratories. The first operational use case is being deployed at national level for the **large-scale land use description project (OCS GE) for the purpose of monitoring land take**. As such, an Artificial Intelligence roadmap will soon be published by the Institute, which will be rolled out over the period 2021-2024.

A new land use benchmark for controlled land take

Urbanisation leads to the reduction of natural, agricultural or forest areas. This is one of the main causes of the decline in biodiversity. It also intensifies soil sealing, which prevents rainwater from infiltrating. Finally, it reduces the soil's natural carbon reservoirs, by reinforcing urban heat islands, thus contributing to climate change. In order to limit the negative effects of land take, the government has set a target of "net zero land take" by 2050.

In order to guide the definition and implementation of measures adapted to this objective, as well as to monitor their effectiveness, CEREMA, INRAE and IGN were entrusted in 2019 with the establishment of a National Soil Artificialisation Observatory and the production of a vector database, representative of land use on a large scale (OCS GE). Obtained by automatic analysis of aerial and satellite images (using artificial intelligence or deep learning), reinforced by the cross-referencing of multi-source data and manual checks or retrievals, the OCS GE is a database which by 2024 will cover mainland France and the overseas departments and regions with a sufficient level of detail to detect changes in spaces and monitor land take.

The project is co-financed by the Fund for the Transformation of Public Action (FTAP), the General Directorate for Planning, Housing and Nature (DGALN) and the General Directorate for the Economic and Environmental Performance of Companies (DGPE).

Portal of the National Soil Artificialisation Observatory: <https://artificialisation.biodiversitetousvivants.fr/>



OCS GE

Various initiatives now exist which prefigure in-depth knowledge of environmental matters.

Some examples:

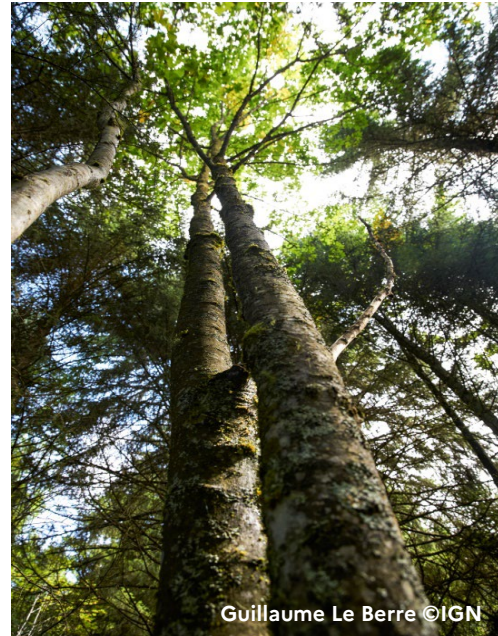
A national repository of hedges and mapping of hedgerows

As essential elements of the agricultural landscape, hedges have many ecosystem benefits including the preservation of biodiversity, the improvement of water quality and infiltration, the fight against erosion, carbon storage, etc. Since 1950, it is estimated that 70% of France's hedges have disappeared as a result of the consolidation of agricultural plots. To remedy this, public policies have been launched such as the agroforestry development plan of the Ministry of Agriculture and Food, the biodiversity plan of the Ministry of the Ecological Transition and the "Plantons des haies" (Let's plant hedges!) initiative of the France Relance recovery plan. In addition, under the current and future Common Agricultural Policy (CAP) (from 2023), topographic analysis of hedgerows will be important.

In this context, IGN co-produced the Hedgerow Monitoring System (DSB) with the French Office for Biodiversity (OFB). A first map has been published making it possible to draw up indicators and an inventory of hedgerows in France, from both a quantitative and a qualitative point of view, and to estimate the stocks of wood, biomass and carbon in bocage hedgerows.



Forest Observatory project, a shared knowledge tool on forests and woods.



In the context of the *Assises de la Forêt et du Bois* (Forest and Wood Symposium), announced on 24 July 2021 by the Prime Minister, IGN proposes co-constructing, with a panel of interested parties in the sector, a forest observatory. The objective of the proposal is to jointly collect and develop reference information to monitor changes in forests (resources, biodiversity, carbon, leisure) in the long term, but also to provide reaction capacities in times of crisis. The Observatory wants to be a place for debate between the main forestry players on topical themes in order to promote a common understanding on the basis of reliable, robust data and scientifically substantiated methods. The know-how and data from the forest inventory will contribute to the work of this observatory.

Continuous observation but also emergency response: Storm Alex – aerial shots to aid a disaster-hit area



Following the passage of Storm Alex, which hit the Alpes-Maritimes department hard in October 2020, an IGN aircraft flew over the disaster areas as a matter of urgency, at the request of the Departmental Directorate of Territories and the Sea (DDTM 06) and the National Forestry Office (ONF), to acquire very high resolution aerial shots between 5 and 15 cm (more than 2,000 images at around 10 cm resolution in the bottom of the valley) and Lidar data (laser remote sensing technique that provides 3D scatter plots).

These images can be compared on the site alex.ign.fr with aerial shots taken at 25 cm, during the summer of the same year, as part of the three-year coverage of the territory used for maintaining 1:25,000 scale maps. This striking before-and-after comparison provides an inventory of the situation preceding the disaster, which is particularly valuable for measuring the impact.

All of this constitutes tangible support for damage assessment and reconstruction.

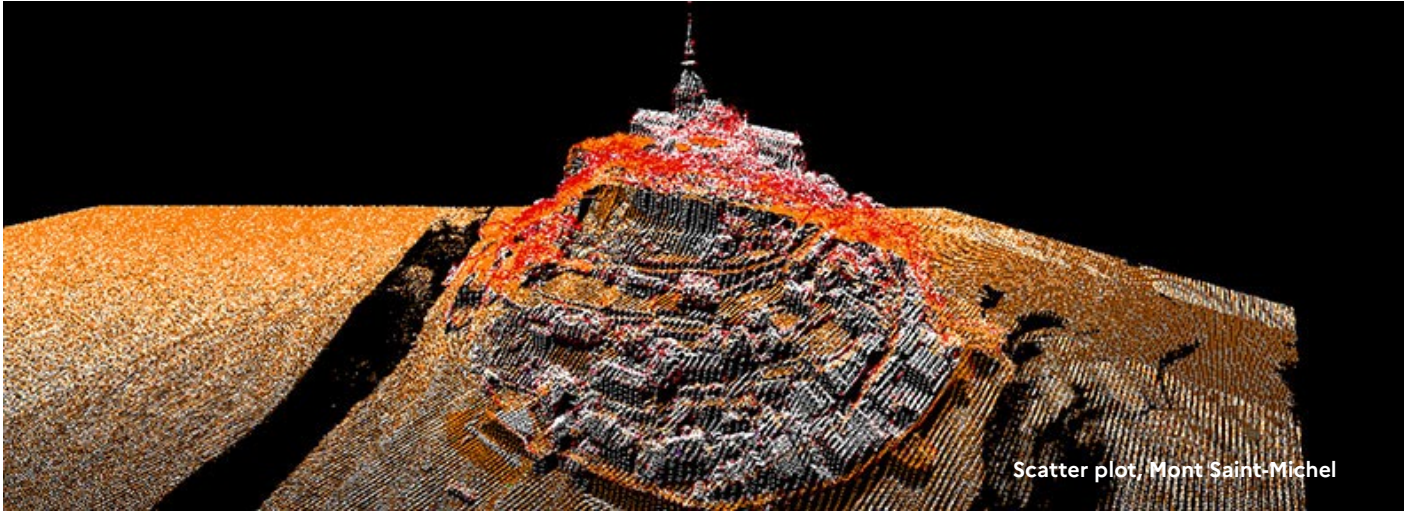
Beyond the observation technology (digital camera, infrared camera, radiometer, statistical surveys, etc.) and processing technology (photo-interpretation, artificial intelligence, etc.) already deployed, IGN will organise data collection campaigns under more severe, more complex conditions that will meet the need for more detailed and more precise data.



Project 2 |

3D mapping

>The HD Lidar programme for the whole of France



Scatter plot, Mont Saint-Michel

To increase the precision and possibilities of data exploitation, **IGN will produce a three-dimensional (3D) model of the whole of France**, a true linchpin for the “digital twins” necessary for in-depth analysis of the territory and the simulation of phenomena.

HD Lidar greatly facilitates soil mapping. Where previously it was necessary to use direct field surveys (such as the trajectography of a precise GPS carried in a backpack) or winter shots (where the ground is more easily visible due to the absence of leaves on the trees), High Density Lidar surveys (HD, 10 points per m²) allow much more precise 3D mapping of the soil and the land to create very precise digital surface models.

Work on the use of Lidar scatter plots with players in key sectors (cities, biodiversity, energy transition, forests, agriculture, construction, infrastructure, security, etc.) will offer ample opportunities for innovation, both to meet the needs of public policies (mapping related to flood risk in order to better understand and reduce the vulnerability of exposed territories, evaluation of woodland heritage

in addition to forest inventory field operations, an objective and consistent method for calculating pastoral and herbaceous areas within the framework of the Common Agricultural Policy, assistance in checking energy saving certificates, etc.) and those of economic players (forestry cooperatives, network operators, etc.).

The high-density airborne Lidar data acquisitions carried out between 2021 and 2025 will lead to the gradual availability of 3D representations of the territory in open data. The first experiments in terms of exploitation could take place from the beginning of 2022 with the opening of a sandbox for interested parties as well as a call for IGNfab projects.

The HD Lidar programme for the whole of France 2021-2025

- **5-year Lidar acquisition project**
- **Engaged public and private partners**
- **A cost of €60 million**
- **Project supported by the Fund for the Transformation of Public Action (€21.55 million) and the France Relance recovery plan (€22 million).**

The first Lidar acquisition phase scheduled for spring/summer 2021 is complete. With the help of specialised operators from the private sector, IGN covered Corsica, and a large part of Provence-Alpes-Côte d'Azur, Isère, Dordogne and the Languedoc region. Winter 2021-2022 will be dedicated to acquisitions in the Vosges region and the Rambouillet area. From spring until the end of summer 2022, acquisitions will continue in the South and part of the East of France, the objective being to complete Lidar coverage of 38 departments in the South-East in autumn 2022. Validation of the acquisitions that have been completed is in progress. The data will be processed after this validation.



Project 3 |

Resources commensurate with the challenges

>A recruitment and training plan

These ambitious projects, which mobilise new technologies (AI, deep learning, remote sensing, etc.), entail profound changes to IGN's professions and skills. As well as staff needing to train and retrain, new talent must be brought in.

IGN estimates there are between 100 and 150 new skills to acquire and is launching **a recruitment and training plan** (data science, 3D altimetry, geovisualisation, agile development). Training courses can be held at the Institute's National School of Geographic Sciences (ENSG-Géomatique).

A managerial and human project for teams actively involved in the Institute's ambitions will soon be deployed.



Students at ENSG ©IGN



02.

IGN, a digital commons player

3 emblematic projects

A "commons space"

A labelling system

The "IGN *fab* forum"



Using openness to develop the commons

After the opening up of IGN data on 1 January 2021, the aim now is to co-construct data repositories, services and tools for geographic information to serve the general interest. With citizens and for citizens, with territories and for territories, that's the GeoCommons!



In January 2021, IGN opened up its data and main source codes, a step that began back in 2009 and which has been reinforced according to various regulatory developments⁷. In 2020, a report led by Eric Bothorel⁸ emphasised the challenge of opening up data, and of sharing it between administrations (ministries, local authorities, public services, regional government, etc.). As such, the mission reiterates that the opening up of data only goes halfway towards users, with significant work still to be done in terms of tools for disseminating geodata and sharing tools and methods between public players.

In this context, free access to data is an asset for working in a much more open and collaborative way, at the level of data production or dissemination.

Like the wide range of initiatives in various sectors of society (mobility factory, digital commons factory, logistics factory, etc.), for IGN, it is about making the most of the opportunities offered by the dynamics of the commons. Enabling a large ecosystem of communities of public and private players and citizens to use the representation of the territory independently of the solutions offered by the digital giants.

⁷ Law No. 2015-1779 of 28 December 2015 on free access to and the terms of reuse of public sector information, Law No. 2016-1321 of 7 October 2016 for a digital Republic, Law No. 2015-991 of 7 August 2015 on the new territorial organisation of the Republic (NOTRe)

⁸ For a public data policy, 23 December 2020, available here: <https://www.vie-publique.fr/rapport/277879-pour-une-politique-publique-de-la-donnee>



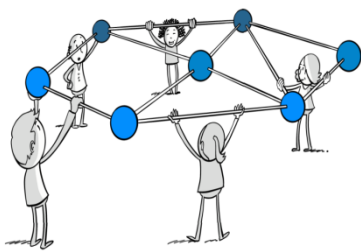
Project 1 |

Mobilising the ecosystem around shared challenges

>A commons space

IGN’s production activity will refocus on mapping the Anthropocene. However, there is still a huge number of applications that call for the availability of open data and tools outside the closed model of the digital giants. Communities are involved in this movement, which can be further amplified.

Like a mediator of the commons, IGN intends to set up a **“commons space”, equivalent to a marketplace for the commons**. The idea is to bring together interested parties around collective challenges. “Calls for commons” will be organised to allow communities to suggest challenges to be solved together. A “GeoCommons Factory” to accommodate and develop these projects is currently being planned at IGN. The GeoCommons Factory will build data, tools and open digital services, according to the principles of shared governance.



The Geoplatfrom, a shared infrastructure for hosting and sharing geodata, will be open to the commons, serving as a bridge between players.

“GeoCommons? Chiche!” (GeoCommons? We’re game!) – OpenStreetMap France welcomes IGN’s new initiative

A major trailblazer in the geographic commons, OSM France is building on IGN’s “*géo-communs avançons ensemble*” (GeoCommons, let’s move forward together) public consultation, stressing the importance of two projects to be developed together, an “open street view” and a navigable road base.

OSM also indicates the conditions it considers necessary for such projects to succeed. IGN is delighted to engage in co-construction work with a rich, dynamic ecosystem that is largely committed to open source models.

Article to be found here:

<https://www.openstreetmap.fr/geo-communs-chiche/>

The Geoplatfrom, an open infrastructure

IGN has launched construction of the Geoplatfrom, a technical tool for the use of geodata in public decision-making.

Although data is revolutionising public action, the geographical dimension is particularly significant for action management and mediation with the public. The Geoplatfrom offers useful functions for this purpose: quick and easy access to data, streamlining of the existing system, development of common standards and specifications, data certification, acceleration of the development of innovative applications, etc. In 2021, the Geoplatfrom project reached important milestones (approval from DINUM, choice of the host OVHCloud and the industrial consortium in charge of its development and operation). The project will now enter a practical phase of co-construction with the many partners interested in contributing to it, including: ASP, ADEME, INSEE, ONF, Shom, CRIGE PACA, CRAIG AURA, OpenIG, PIGMA, Géopal, GRIGE Normandie, etc. Construction costs are estimated at €14.4 million, including €3.6 million financed by the Fund for the Transformation of Public Action (FTAP). The Geoplatfrom will also be used to host the commons developed in the Factory.

More information here: <https://www.ign.fr/geoplatforme>



Project 2 |

Feeding on the wealth of the communities >A labelling system

The dynamism of the ecosystem of geographical information players and the passion of users for maps, geography and regional descriptions offer a huge opportunity to enrich the thematic data collected by its user communities. For example, the Institute’s nature activities portal (IGNrando’) brings together more than 3,000 contributing communities who share their walks and hikes. The collaborative space, a place for sharing data and reports and precursor of the Geoplatfrom, also collects data transmitted by partners (departmental fire and rescue services (SDIS), local authorities, expert surveyors, national and regional parks) on a variety of themes (emergency points in forests, declaration of forest areas affected by bark beetles) and points of interest (with mentions of restaurants, shops, cycling routes, etc.).

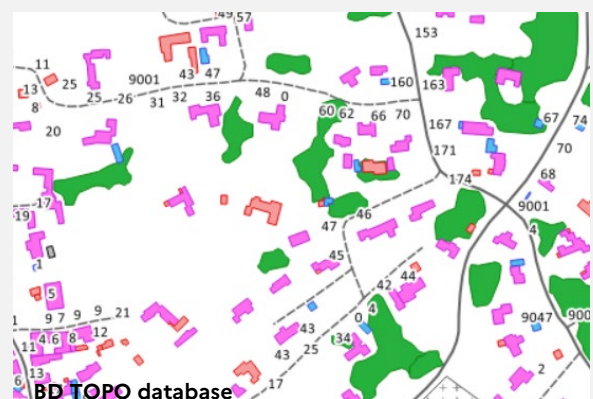
The sector thus has highly committed communities of partners and users, who are able to help enrich and update the databases more regularly. To develop this potential, IGN intends to **create a labelling system for public partners or contributing communities authorised to update IGN’s “BD France” database independently**. IGN’s strategy is thus more a matter of “community-sourcing” than “crowdsourcing” and does not intend to compete with other initiatives or communities. It is a question of using labels to set up several levels of guarantee on the data published and in particular of allowing a contributor to see the data provided even before it can be verified. Authoritative data will continue to be guaranteed by one of the Institute’s agents.

Note: The BD France database brings together several databases describing land occupation and uses in the national territory in different forms, with topographic components (BD TOPO)

Experimenting with collective contribution to the “BD TOPO” database

In April 2021, IGN launched an experiment on the direct contribution by partners of the 3D description data of elements in the territory and its infrastructure. This experiment should usher in the labelling system. The test was initially open to three partners:

- The hydrographic segments office of the Departmental Directorate of Territories
- The road sections office of the Gard Departmental Council (CD 30)
- The departmental fire and rescue service (SDIS) authority 29 to contribute on road sections as well as on industrial activity zones (ZAI) and buildings.





Project 3 |

Partnerships with industrialists and start-ups

>The “IGNfab forum”

The territorial knowledge sector is full of innovations. France in particular has seen the emergence of many start-ups in this sector in recent years. IGN intends to resonate with this rich ecosystem, in order to get up to speed with the economic challenges of the sector, promote the transfer of innovations resulting from research and, where appropriate, consider partnerships to jointly meet the growing needs of public players in the field of data, in conjunction, where applicable, with

Afigéo, an association that brings together the main players in the sector. To this end, IGN is setting up an “IGNfab forum”, a place for discussion with entrepreneurs in the sector, players in innovation and French Tech, with the aim of prolonging the IGNfab start-up support programme (see box), which will continue and be enriched with the forum’s support.

IGNfab

IGNfab, a link with the start-up ecosystem that will be strengthened

Launched in 2014 by IGN in partnership with the Cap Digital competitiveness cluster, IGNfab is a project accelerator that helps start-ups, SMEs and VSEs to develop innovative products and services using land description and geolocation in various sectors such as the environment, forests, energy, land use planning, tourism, recreation, etc. IGN makes its data, technology and technical expertise available to start-ups incubated at IGNfab, and provides institutional and commercial support, as well as an “IGN label” for the products and services developed. As for start-ups, SMEs and VSEs, they offer IGN exposure for its data through tangible applications.

IGNfab in 6 years > 6 calls for projects > 160 applications > 30 projects selected > 77 partners
The themes of the 6 calls for projects: Energy and climate - Agriculture, forests & biodiversity - The cities of tomorrow - Tourism, leisure, enhancement of territories and heritage - Climate change and risk prevention - Town planning and regional development.

Find IGNfab gems at: <https://www.ign.fr/ignfab>

To find out more: As part of its next call for projects, IGNfab will provide start-ups and SMEs with a “sandbox” that will allow access to all the initial data from the 3D model for the whole of France.

Research at IGN, leading the way in knowledge commons

Through its teams at the forefront of research, IGN has long been involved in the co-construction of knowledge commons. IGN research is organised around major areas such as acquisition, processing, data enhancement, geovisualisation, forest inventory and geodesy.

In the field of geodesy, IGN research has joined the joint research unit “*Institut de physique du globe de Paris*” (IPGP - Paris Globe Institute of Physics) to strengthen the necessarily joint approach to measuring the shape of the Earth (geometry and gravity) and understanding internal phenomena, such as the dynamics of the earth’s crust.

The Nancy forest-woodland division hosts the Forest Inventory Laboratory (LIF), which finds leading partners to increase the value of its work: coupling of inventory measurements with the observed density of woodland, studies on the flammability of forests, etc.

The Laboratory on Geographic Information Science and Technology for sustainable development and smart cities (LASTIG) is leading the creation of a joint research unit between IGN, the Gustave Eiffel University (UGE) and the Paris School of Urban Engineering (EIVP). This project aims to strengthen collaboration between geographic information sciences and other disciplines, such as sociology or demography, for a better understanding of the challenges of the city of the future, the thematic base of ISITE FUTURE, which gave birth to the UGE.



03.

IGN, cartographer and companion of discoveries and representations

3 emblematic projects

A smartphone plan

New paper maps

The “public service cartographer” desk

Shared cartography programmes

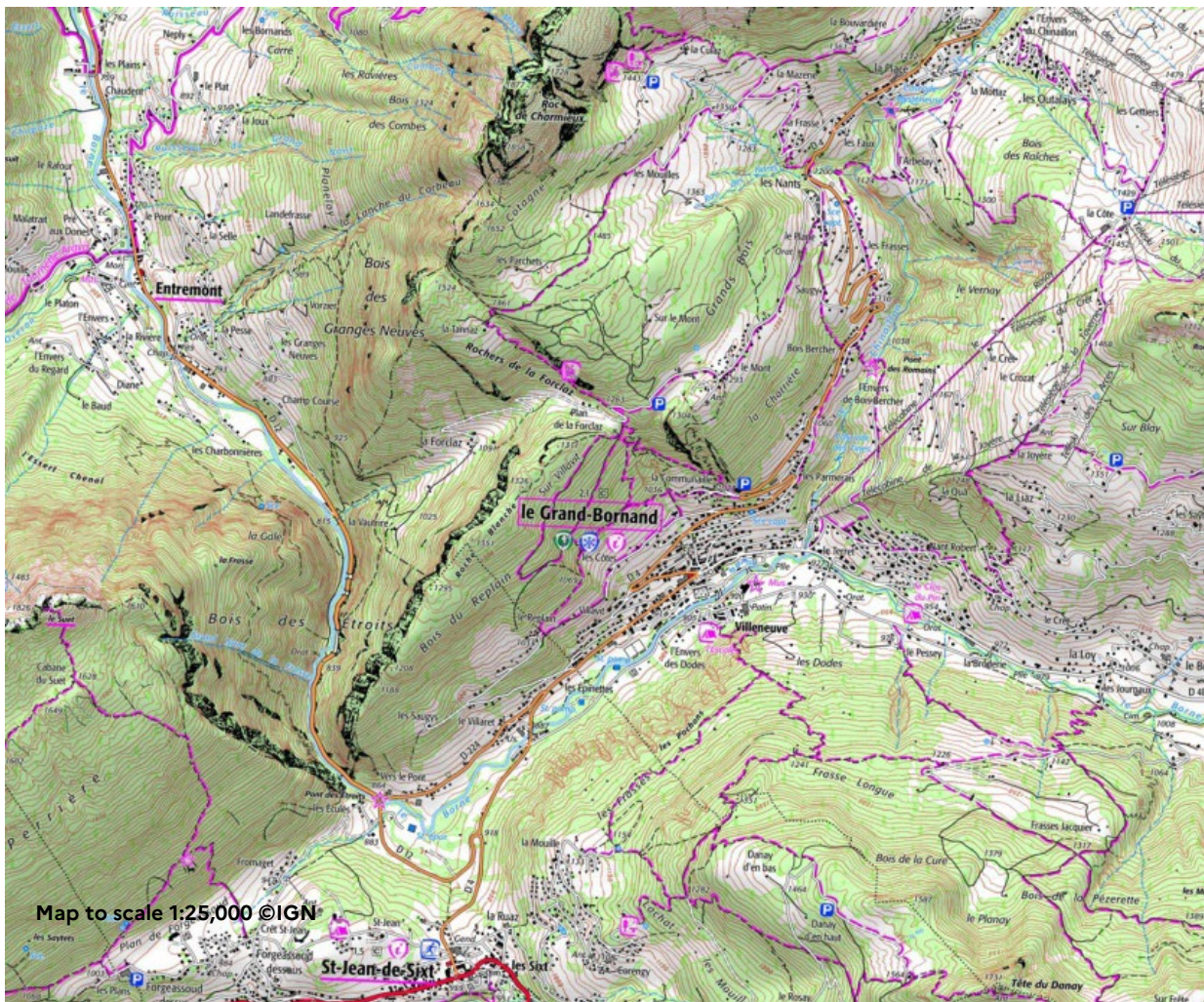


Maps to understand and take action

As well as drawing the world, maps can also get people to look at it in a certain way. With the increasingly widespread use of geographic tools and data, a wide range of people are now using maps as tools for education, mediation and debate. Maps are becoming “engaged” and IGN intends to participate in this dynamic as a leading national public institute.

People in France mainly know IGN for its TOP 25 map, the queen of hiking maps (scale 1:25,000), or for its relief maps commonly found in mountain refuges and tourist residences. Now more than ever before, after several months of lockdown, the French need to get out and soak up nature, with a paper map that never malfunctions and allows them to reach for the sky. In the summer of 2021, sales of IGN maps saw an average increase of 25%.

The challenge today is to continue to bring to life and share the profession of territorial representation through cartography, in particular by developing IGN’s smartphone presence. IGN will also be part of this booming map ecosystem: maps as a tool for citizen empowerment, through enriched views, popularisation and public awareness.





Project 1 |

An alternative to Google and Apple
 >A smartphone plan



The digital giants have encouraged unprecedented and widespread access to maps. But their hegemonic position poses the risk of the territory being represented in a way that is subservient to their economic interests.

It is therefore necessary to ensure that citizens are the masters of their geographic presence, that they are able to use their territory, understand it and find their way around without depending on closed models.

To do this, IGN will work to improve its digital media beyond its paper maps, in connection with the ecosystem. In this sense, IGN will work on **an alternative smartphone plan to Google and Apple** that respects the wealth of the national territory and the freedom of users. Given the initiatives that already exist in this area, the challenge is to bring together the interested parties and IGN proposes that this project be co-constructed in the GeoCommons Factory. The natively digital mapping module, Plan IGN, can be made available for this work.



Project 2 | Supporting French leisure time >New paper maps

Although the GeoCommons approach promises profound changes to professions and interactions with the ecosystem, the Institute will nevertheless continue to work on, enrich and develop its maps with **new paper maps to meet the expectations of French people** (reconnecting with nature, heritage, cycling, etc.) and publish more recent and accessible 1:25,000 maps. An in-house project carried out in partnership with ESRI France will make it possible to automate the production line of cartographic bases. The labelling system to better structure feedback from the communities of partnerships and users will promote this ambition.



Project 3 | Helping to modernise local authorities and communities >The “public service cartographer” desk

Mapping tools can make a decisive contribution to the management of public policies and to the mediation of public authorities with their constituents. To encourage this use, IGN will set up a **“public service cartographer” desk** that will support all local or national authorities wishing to use maps in their modernisation. This service will rely on the functionalities of the Geoplatform in terms of hosting and geovisualisation for authorities that want this.

This service will also be an opportunity to promote innovative visualisation technologies and make them widely available, allowing a better understanding of phenomena and the continuous improvement of public services in the territories (mapping of urban heat islands for the implementation of city policies, artificial areas for urban development plans, geolocation of public buildings).

Mapping needs highlighted by the health crisis

In the midst of the crisis, IGN, represented by four hackers and mentors, took part in the Covid-19 online Hackathon, launched by Futurs publics-DITP, to reflect collectively on health, economic and social challenges. Organised around four challenges, the idea was to put forward solutions to combat the pandemic and mitigate its effects on society. There has also been a request to help the AP-HP (Paris Hospital service) with the “CoVizu” project, hoping to propose innovative spatio-temporal visualisation methods and help identify sources of contamination at neighbourhood level. The ENSG-Géomatique Laboratory on Geographic Information Science and Technology for sustainable development and smart cities (LASTIG) is participating in this project alongside the Techniques, Territories and Societies laboratory of Gustave Eiffel University and AP-HP. Together with INRIA, IGN is participating in the self-funded project ICI (INRIA - Collaboration - IGN) to develop an epidemic propagation simulator based on very detailed modelling of an urban space and its population. This simulator should help health authorities make decisions to best control the spread of the epidemic.



Project 4 | Engagement in socially aware mapping >Shared cartography programmes

Maps offer great opportunities for storytelling, awareness and sharing. By visually representing phenomena, maps are inexhaustible resources of knowledge and mediation.

To participate in this dynamic, IGN will develop **sharing, scientific popularisation and citizen awareness programmes on the subject of cartography and the issues to which it can contribute, embodied by places:** Musée des Arts et Métiers (see box), the Géoroom in Saint-Mandé (school groups, commons players) and IGN sites in the region.



Exhibitions and animations aimed at promoting the graphics and aesthetics of territorial representations, the cartographer's historical instruments and the potential of geomatics research will be implemented with committed partners. Already invested in schoolchildren, IGN will strengthen its interaction with the community of history and geography teachers and educational groups to introduce young people to the use of maps and raise awareness of current digital and ecological challenges.



IGN's Heritage at the Musée des Arts et Métiers!

IGN has a rare collection of old measuring instruments, mostly from the period 1750-1950. They are the legacy of the Academy of Sciences, the *Dépôt de la Guerre* (France's military archive and cartography department) and the *Service Géographique des Armées* (Geographical Service of the Army). This collection is gradually being donated to the Musée des Arts et Métiers. This donation will breathe new life into this collection. It opens up new avenues to new collaborations, conferences, exchanges, etc., which will enhance this unique collection.





About IGN

1940 Creation of the National Geographic Institute (IGN), replacing the Geographical Service of the Army

1958 Creation of the IFN

2012 The National Geographic Institute and the National Forest Inventory merge

2021 IGN makes its data freely available

1,517 employees in 2020

€161.7m budget in 2020

1 Grande École based in Champs-sur-Marne:
ENSG-Géomatique, member of the Gustave Eiffel University
www.ensg.eu

3 joint research units

2 imaging centres, aerial (Beauvais) and space (Toulouse)

5 Regional divisions
Aix-en-Provence, Bordeaux, Lyon, Nantes, Nancy

Head Office Saint-Mandé (94)

The National Institute of Geographic and Forest Information (IGN) is a public establishment under the joint authority of the Ministries in charge of ecology and forestry. Its vocation is to produce, represent and disseminate reference data relating to knowledge of the national territory as well as French forests and their evolution.

Most of the Institute's data is available online on the Géoportail.gouv.fr website, and since 2021 it has been open access on Géoservices.ign.fr. IGN's productions are geared towards supporting public policies: environment, regional planning, sustainable cities, risk prevention, agriculture, armed forces, etc. In a growing number of areas, IGN is developing collaborative productions with local authorities and communities of public and private players or citizens.

Through its engineering school, ENSG-Géomatique, and its multidisciplinary research teams, the Institute has great potential for innovation in multiple fields (geodesy, forests, photogrammetry, artificial intelligence, spatial analysis, 3D visualisation, etc.).



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