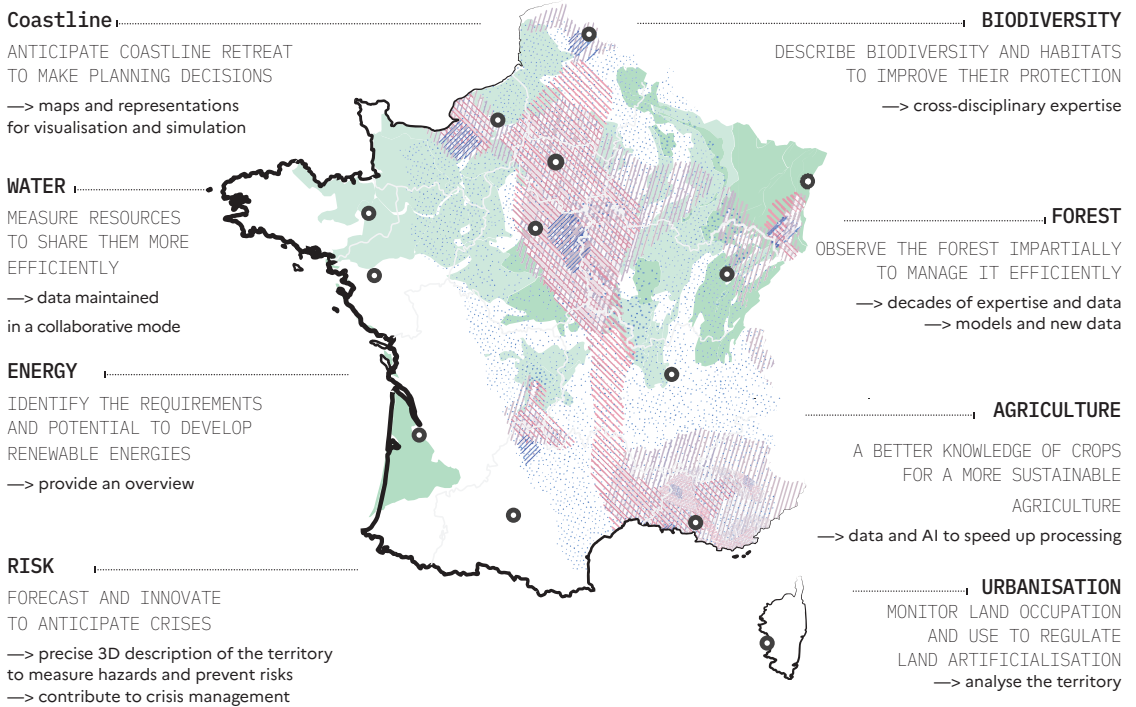




**CHANGE
SCALE**

ANTHROPOCENE, THE CARTOGRAPHER'S NEW FRONTIER

CARTOGRAPHY IS A FANTASTIC PLANNING TOOL. BY HARNESSING VARIOUS DATA SOURCES AND ACCELERATING AUTOMATED PROCESSING THROUGH ARTIFICIAL INTELLIGENCE, WE CAN CONSTRUCT AN ENVIRONMENTAL CHANGE MANAGEMENT SYSTEM, ENABLING US TO MAKE THE RIGHT CHOICES FOR OUR TERRITORY.



8 MAJOR CHALLENGES OF THE ANTHROPOCENE

URBANISATION - RISKS - FORESTS - BIODIVERSITY - AGRICULTURE - COASTLINE - WATER - ÉNERGY

MANAGEMENT TOOLS



COASTLINE
MONITORING

WATER RESOURCE
MANAGEMENT

RENEWABLE
ENERGY PORTAL

RISK
PREVENTION

HEDGEROW
MONITORING

FRENCH FOREST
OBSERVATORY

LAND
ARTIFICIALISATION

WHEN EVERYONE'S WALKING AROUND WITH A DIGITAL ATLAS IN THEIR POCKET, WHAT'S THE POINT OF A PUBLIC NATIONAL MAPPING INSTITUTION?

IGN, THE PUBLIC SERVICE CARTOGRAPHER.

/ USING DATA TO DRIVE CHANGE IN TERRITORIES

Amid significant ecological, socio-economic, and demographic transformations reshaping our territories, it's imperative that we grasp the implications at an individual level. Understanding these implications is key to anticipating and making decisions that will shape our collective future..

/ INVESTING IN TECHNOLOGY

Tools like satellites, aeroplanes, drones, radar and LiDAR all document the world with ever greater resolution and frequency. Artificial intelligence (AI) amplifies the potential for combining these sources to reveal complex phenomena, paving the way for a digital twin of France. IGN is wholeheartedly dedicated to this endeavour through its teams, engineering school, research units spanning various fields (geodesy, forestry statistics, data science, 3D, etc.), and its collaborations with innovative companies.

/ CONTROLLING OUR DESTINY

At a time when a handful of global giants dominate the digital world, we need to guarantee sovereign control over our country's data. As a dual institute, IGN also serves the armed forces, and France is one of the few countries in the world to have full expertise across the entire military geographic information chain.

/ BRINGING GEOCOMMONS TO LIFE

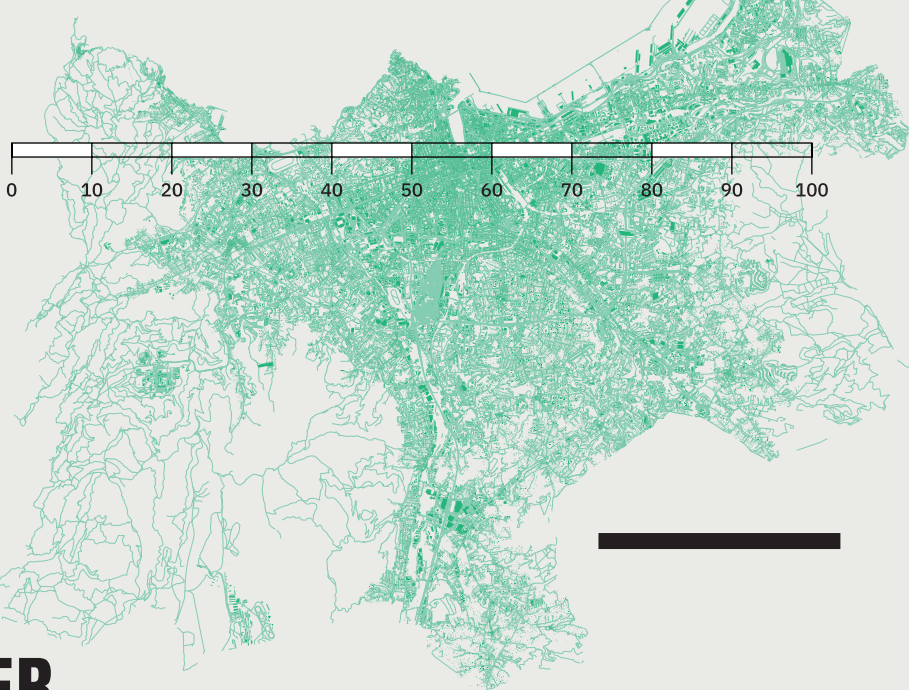
L'IGN as a public institution, maintains reference data and representations as open data. We also encourage the creation of geocommons, co-produced by public, private and community organisations.

KEY FIGURES FOR IGN *

1600 EMPLOYEES
187 MILLIONS BUDGET (2023)
50% OF BUDGET ON LARGE PROJECTS IN SUPPORT OF PUBLIC POLICIES
2 SUPERVISING MINISTRIES: ECOLOGY, FORESTRY (AGRICULTURE)
2152 TB OF OPEN DATA ON THE GÉOPORTAIL

5 REGIONAL CENTRES
2 IMAGING CENTRES (AERIAL AND SPATIAL)
1 GRANDE ÉCOLE, ENSG

* January 2024 figures



7 MN READ

IGN'S OFFER TO SUPPORT PUBLIC POLICIES

AS THE KEY PLAYER IN NATIONAL DATA, IGN IS REINVENTING THE MAP FOR ALL PUBLIC POLICIES. TO REMAIN SOVEREIGN, LET US INVEST TOGETHER IN TECHNOLOGY AND COMMONS.

USE

THE MAP IN YOUR PUBLIC SERVICES

The map is a powerful outreach tool that elected representatives and public policy-makers must be able to make full use of.

A map makes complex phenomena comprehensible, bridging the gap between hardly visible information and public understanding, facilitating communication among stakeholders and the general public. In order to exploit its full potential, we offer simple data visualisation tools that are available to everyone.

With the turnkey macarte.ign.fr service, which is gradually being integrated into the cartes.gouv.fr website, you can compose, publish and distribute thematic maps on specific issues. IGN offers support for setting up more sophisticated websites, like the *Géoportail de l'Urbanisme* or the *Portail des Énergies Renouvelables*.



ACCESS

FUNDAMENTAL DATA

The collection and production of sovereign data, sometimes referred to as fundamental data, is central to the Institute's public service mandate. We maintain key reference frames such as the national forest inventory, aerial surveys, topographic databases including descriptions of roads and trails, buildings, hydrology and vegetation, altimetry, geodetic databases and the Plan IGN multi-scale cartographic map. This data is available to everyone, free of charge, for download or as data flows that can be integrated into your applications. Collaborative updating is being developed with local partners.



MAKE IT HAPPEN

SECTOR-SPECIFIC REFERENCE FRAMES

IGN works with public-sector clients to assist in implementing policies by producing large-scale land use maps (OCS-GE), natural or semi-natural habitat maps (CarHab) for the Ministry of Ecology Transition, the land parcel reference frame (RPG) for the Ministry of Agriculture, and *Geosocle* and *Geomaps* reference frames for the Armed Forces Ministry.

- > Data production with public partners, companies or start-ups
- > Overcoming technological locks through innovation
- > Assistance to data project owners
- > Dissemination and promotion of public information



AERIAL AND SATELLITE IMAGES
HD LIDAR



LAND USE
AGRICULTURAL PARCELS



GEODESY
HYDROGRAPHY
ALTIMETRY



MAPS
BASE MAPS
ROAD MAPS



TOPOGRAPHY
ADMINISTRATIVE BOUNDARIES
ADRESS



NATIONAL FOREST INVENTORY
REE SPECIES MAP
BUSH CLEARANCE





BRING

YOUR ECOSYSTEM TOGETHER THROUGH DATA AND ACCELERATE YOUR COMMONS



Data is used by many communities that are often quite different, including producers, users, and services. In response, IGN offers «commons platforms», data and tools to bring together collective efforts, combat silos and share ambitions on local and national levels.

IGN is making its **Géoplateforme** available to all, a co-constructed, open and shared platform for hosting and sharing data. Like a cooperative, the Géoplateforme offers turnkey tools and functions via the cartes.gouv.fr interface. Even inexperienced users can harness and share comprehensive data and develop services tailored to their needs.

Accelerate the address of challenges of general interest that cannot be solved by isolated entities such as creating national databases for addresses, buildings and forest fire prevention. The Fabrique transforms these use cases into effective commons.

Together, let's scale up data policy!

The **Fabrique des géocommuns*** aims to acce-

* THE COMMONS INCUBATOR HOSTED BY IGN - MEMBER OF THE BETA.GOUV NETWORK

FIRST PUBLIC UTILITY COMMONS

INFRASTRUCTURES - LOCALISATION - IMMERSIVE VIEWS - URBAN PLANNING - FORESTRY

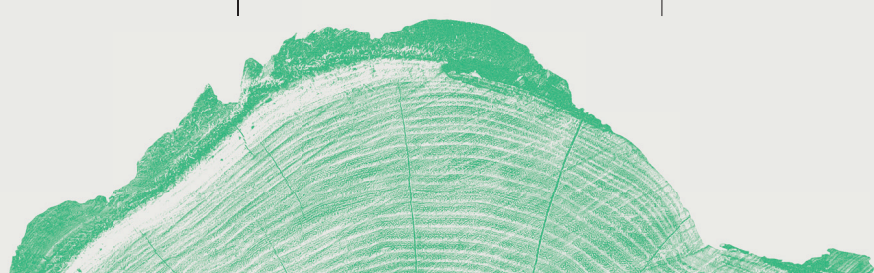
CARTES.GOUV.FR
GÉOPLATEFORME
FABRIQUE DES GÉOCOMMUNS

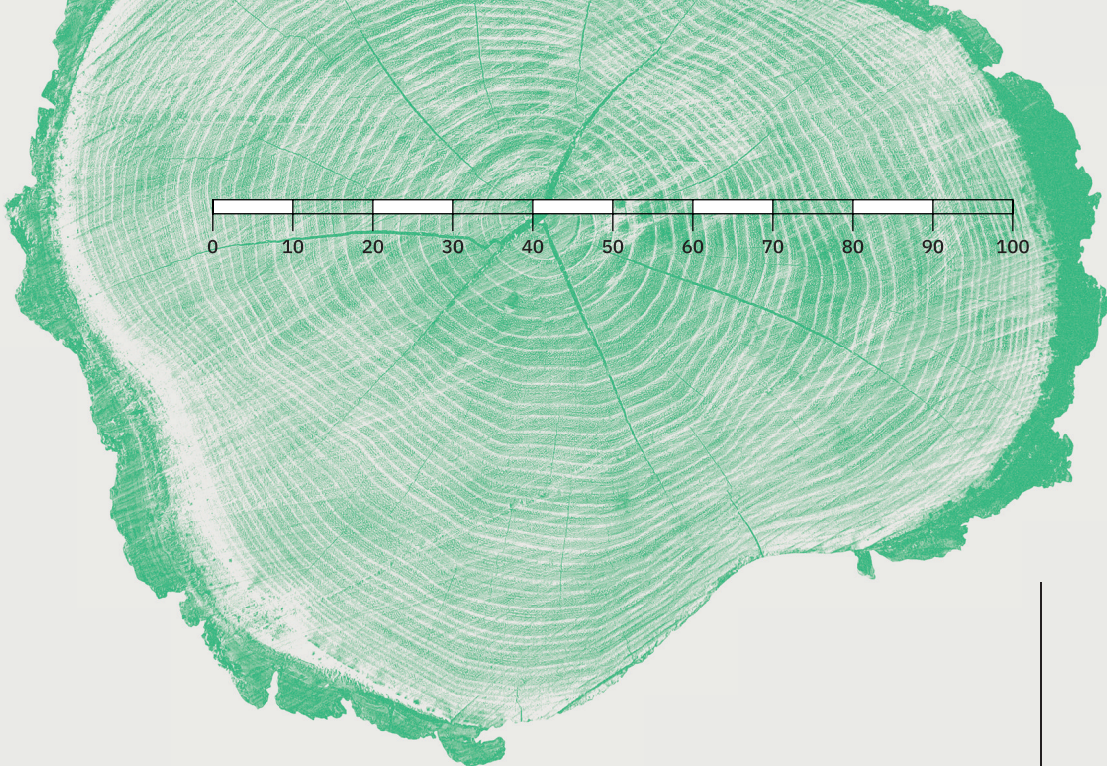


BAT-ID
NATIONAL ADDRESS DATABASE
PANORAMAX



FRENCH FOREST
RESERVATORY





CARTES.GOUV.FR * **THE MAP KIOSK**

THE FUTURE NATIONAL MAP PORTAL

EXISTING BRICKS

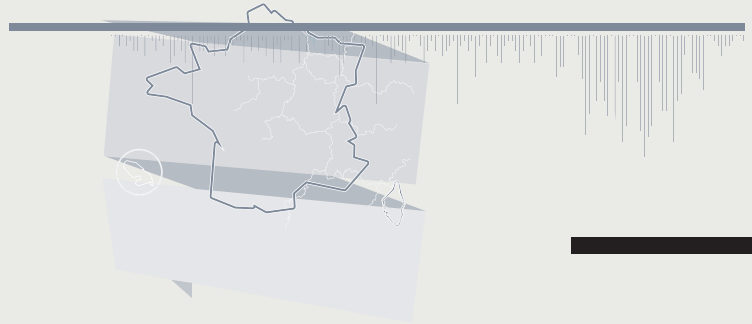
- / MAP APP. ON CARTES IGN
- / MAP VISUALISATION ON GEOPORTAIL.GOUV.FR
- / CATALOGUE OF DATA AND SERVICES ON GEOSERVICES.IGN.FR
- / EASILY CREATE AND PUBLISH A MAP ON MACARTE.IGN.FR
- / FORESTS ON FORETS.IGN.FR
- / MAPS AND OLD PHOTOGRAPHS ON REMONTERLETEMPS.IGN.FR

* opening autumn 2024



A technological shift towards continuous observation !

For over 80 years, the IGN has been constantly evolving and is now much more than a mapping institute. In today's digital landscape, location-based information is ubiquitous, generated collectively using increasingly innovative technologies such as geodesy, photogrammetry, artificial intelligence, spatial analysis, aerial and satellite views, LiDAR, radar, drones, and 3D visualisation.

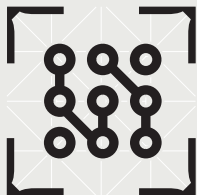


7 MN READ

THE DATA REVOLUTION

- Harness data sources to enrich the description of the Anthropocene.
- Process data quickly to show phenomena with the shortest possible delay.
- Display data in a way that is accessible to all, and suitable for public decision-making.

SUPPORTING LARGE-SCALE DEPLOYMENT OF AI



Artificial intelligence techniques play an essential role in providing accurate and regular descriptions of the territory.

→ **Maintain and strengthen AI's technical capabilities**

Carry out major automation projects

→ **Carry out experiments**

Prepare a response to future challenges and build commons

→ **Participate in AI communities**

Map the Anthropocene and play an active part in the ecological transition

+ IGN's guiding principle is to democratise AI within the institute* and in society as a whole, making AI's capabilities widely accessible and encouraging collaborative discourse on the use and development of this technology.

LAND USE REFERENCE FRAME

COMBINING SKILLS, ACCUMULATING DATA TO UNDERSTAND LAND COVER AND LAND USE

The ocs-ge is the digital map of land cover and land use. When combined, these two pieces of information can be used to analyse the land and quantify the extent of land artificialisation. This reference frame will help to achieve the goal of zero net land artificialisation by 2050, as set out in the french climate and resilience act.

Ign uses AI techniques to produce these digital maps on two different dates, ensuring all contributing data and resources are openly available.

> **by 2024** : The aim is to build up an exhaustive reference frame so that, ultimately, we can accurately visualise land conversion and artificialisation occurring across the country.

> **by 2030** : the objective is to provide an initial assessment of land artificialisation nationwide.



AI TO SPEED UP DATA INTERPRETATION

AI has enormous potential for detecting, identifying and even automatically mapping the cartographic objects that make up a territory. The methods employed are known as machine learning methods, requiring automated input of a huge number of examples to train the models.

HUMAN EXPERTISE FOR ACCURACY

When it comes to qualifying the use or certain subtleties of the terrain, human expertise remains indispensable.

AN EXTREMELY SATISFYING RATE OF CORRECT CLASSIFICATION BY AI

Automatic processing produces a valid classification for 94% of the surface area under consideration. The process is based on technology that learns from its mistakes, so performance should improve still further.



NEW SPACE & LIDAR

MOBILISE A VARIETY OF DATA SOURCES



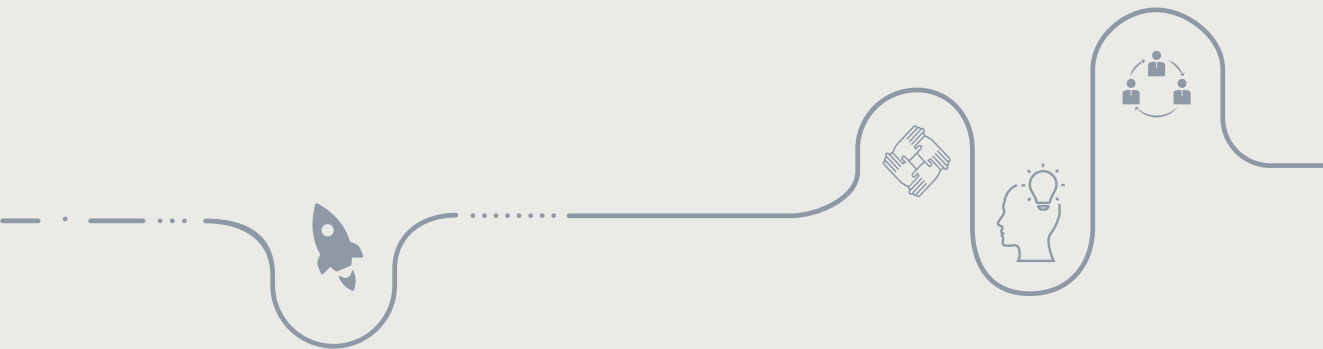
→ **Enhanced expertise in geolocalisation and dimensional metrology**, to better prevent and manage risks induced by environmental changes (landslides, deformation of buildings).

→ **New satellite capacities for a continuous observation of the territory**

The deployment of new satellite constellations or new space opens up new opportunities for observing the territory.

→ **Towards an “agnosticism” of data sources**

The IGN is deploying its processing capacity to cross-reference all types of data sources, ground, aerial, LiDAR, satellite, etc. by breaking down barriers and leveraging these innovations.



WORKING HAND IN HAND WITH START-UPS
AND COMPANIES

DATALLIANCE **THE BEST OF PUBLIC AND PRIVATE** **SECTOR CAPABILITIES**

WORKING TOGETHER TO MEET THE DATA NEEDS
OF PUBLIC POLICIES AND THEIR USERS..

Faced with this growing need, IGN is acting at the confluence of the public and private sectors to provide a joint response, through data, to the major challenges of transition.

- **strengthen synergies with the private sector**
- **to take advantage of its potential for innovation and production**
- **act as guarantor for public users**
- **remove technological or capacity locks**
- **support public project ownership**



THE MINARM x
IGN PARTNERSHIP
LINKS THE INS-
TITUTE WITH THE
EGI AND DGA



MILITARY GEOGRAPHY

IN SUPPORT OF THE ARMED FORCES

The trust and quality of relations between the French Armed Forces Ministry (MINARM) and the IGN are embodied in a partnership that links the institute to the *Établissement Géographique Interarmées* (EGI) and the *Direction Générale de l'Armement* (DGA)..

The Armed Forces Ministry of the relies on IGN to :

1. Prepare, develop and implement geographic data infrastructures for armed forces missions and defence programmes
2. Provide operational support for the armed
3. Exploit the full potential of satellite imagery
4. Ensure interoperable data exchange
5. Provide expertise and know-how in standardisation
6. Perform research activities

As part of the GEODE 4D programme, IGN is assisting the DGA with the implementation of major military geographic information production programmes in areas of interest to this ministry. This programme includes a training component.

LIDAR, LIGHT DETECTION AND RANGING

- Ability to describe the terrain surface, above ground structures (including buildings and engineering structures), and the vegetation accurately and reliably.
- Centimetre-level accuracy.



A STRUCTURING PROJECT
SUPPORTING ECOLOGICAL PLANNING

TOWARDS A DIGITAL TWIN OF FRANCE AND ITS TERRITORIES

BY DECOMPARTMENTALISING DIFFERENT FIELDS AND PUBLIC POLICIES, THE DIGITAL TWIN ALLOWS FOR THE SIMULATION OF FUTURE SCENARIOS.

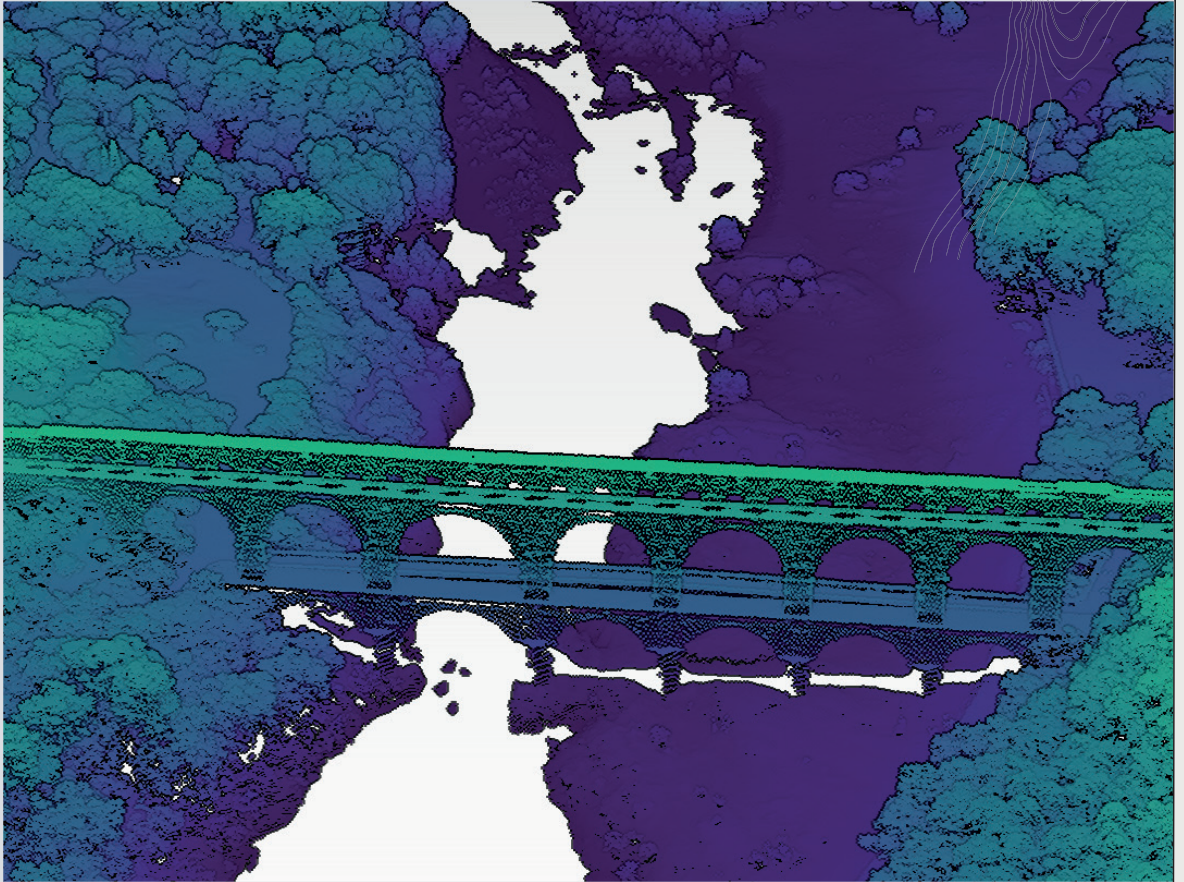
As a collaborative decision-making tool, it can be used to run simulations in many areas of ecological transition, including land-use planning, energy transition, sustainable management of agricultural and forestry resources and natural risk prevention.

This process makes it possible to test hypotheses and plan changes.

France's digital twin is a dynamic digital replica of the country, built on a foundation of 3D data calculated from HD LiDAR and aerial images.

These descriptive data are linked to national data in the fields of ecological transition and equipped with a software environment accessible online.

> **2026 target** : complete 3D mapping of France through the HD LiDAR programme.



ENERGY TRANSITION

- CALCULATING THE PHOTOVOLTAIC POTENTIAL OF ROOFTOPS
- URBAN DENSIFICATION: IDENTIFYING EMPTY SPACES
- INSTALLATION OF WIND TURBINES

TERRITORIAL PLANNING

- CONSTRUCTION/MAINTENANCE OF ROADS AND INFRASTRUCTURES
- PRODUCTION OF 3D MODELS: 5G, NOISE MAPS, FORESTRY RESOURCES...
- COMMON AGRICULTURAL POLICY: MONITORING OF PASTORAL AREAS AND GRASSLANDS UNDER FOREST COVER

PREVENTION OF NATURAL HAZARDS

- FLOOD RISK MAPS
- VULNERABILITY OF AT-RISK AREAS

AND ALSO

BIODIVERSITY, AIR NAVIGATION, NATIONAL SECURITY, ARCHAEOLOGY/HERITAGE



A PUBLIC SERVICE IS FIRST AND FOREMOST A HUMAN COMMUNITY

At IGN, over 1,600 talented people produce, cross-reference and process geodata at different levels of representation and accuracy. Our *raison d'être*, for more than 80 years, has been to observe and describe France, including its forests, landscapes and towns.

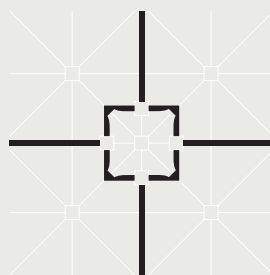
Today, geodata that we are developing with various partners is fundamental in meeting the challenges of climate change and the needs of smart cities, facilitating tomorrow's mobility and promoting the creation of location-based services for a broader audience.

RECRUITMENT
AND TRAINING PROGRAMME

150 NEW JOBS CREATED

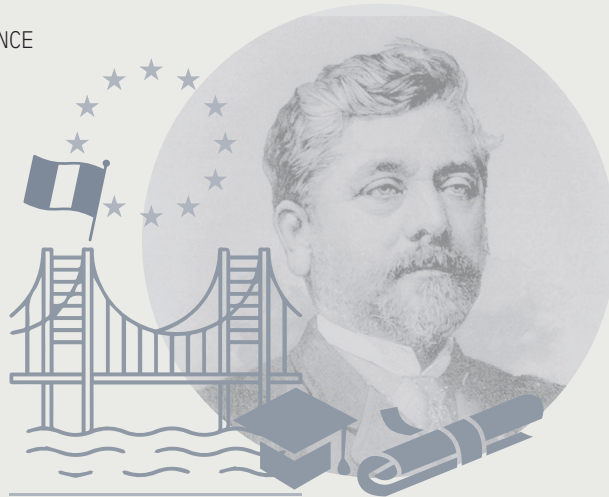
Emerging skills include artificial intelligence, agile programming, data sciences, 3D altimetry, geovisualisation, community leadership, complex and innovative project management, digital infrastructure and services...

in line with the Institute's primary objectives, notably contributing to the *Geocommons* and the mapping of the *Anthropocene* or supporting our major projects such as LiDAR, OCS-GE, *Géoplateforme*, etc.



ENSG-GÉOMATIQUE,
A SCHOOL OF EXCELLENCE

IN GEOGRAPHIC DATA SCIENCES



Thanks to our in-house engineering school, which is also the Geoinformation department of University Gustave Eiffel, and our multi-disciplinary research teams, we are cultivating a potential for high-level innovation across various fields, such as geodesy, forestry, photogrammetry, artificial intelligence, spatial analysis and 3D visualisation.

ENSG-Géomatique is the only *Grande Ecole* to cover both research and training in the fields of geomatics and geographic information, making it France's top school in these areas.

KEY FIGURES FOR THE SCHOOL *

1941/ CREATION OF L'ENSG

SINCE THEN, IT HAS TRAINED MORE THAN 12,000 STUDENTS FROM 80 COUNTRIES.

- 400 STUDENTS AT PRESENT
- 60 ENGINEERS AND 20 ASSISTANT ENGINEERS GRADUATED EVERY YEAR
- 100 RESEARCHERS AND LECTURERS
- 40 PHD STUDENTS
- 6 DISCIPLINARY EXCELLENCE CENTRES

+ MORE THAN 20 PLACES WERE OPEN IN ORDER TO BECOME A GEOINFORMATION CIVIL SERVANT ENGINEER IN 2023.

ENSG, A FOUNDING MEMBER OF THE GUSTAVE EIFFEL UNIVERSITY (UGE) CREATED ON 1 JANUARY 2020.

* June 2024 figures



RECOGNITION

TOPCOM SILVER AWARD 2024 PUBLISHING SECTION
GRANDS PRIX DE LA COMMUNICATION GOLD AWARD 2024 PUBLISHING SECTION
FOR THE ATLAS OF THE ANTHROPOCENE, 2023
PUBLIC-SECTOR INNOVATION AWARD IN 2023
FOR THE FABRIQUE DES GÉOCOMMUNS INITIATIVE
TOPCOM GOLD AWARD 2023 PUBLISHING SECTION
FOR THE ATLAS OF THE ANTHROPOCENE, 2022
FRANCE RELANCE 2021 AWARDS, WINNER OF THE «MOST VIRTUOUS»
PRIZE IN THE STATE PROPERTY RENOVATION CATEGORY
FOR IGN'S TOWER BUILDING IN SAINT-MANDÉ
WINNER OF CALLS FOR PROJECTS FROM THE FTAP
(FONDS POUR LA TRANSFORMATION DE L'ACTION PUBLIQUE)
FOR THE 3D MAPPING PROGRAMME IN 2020
AND THE GÉOPLATEFORME IN 2018

THE NATIONAL FOREST INVENTORY IS RECOGNIZED AS BEING OF GENERAL
INTEREST AND OF STATISTICAL QUALITY BY THE FRENCH NATIONAL
COUNCIL FOR STATISTICAL INFORMATION.

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* June 2024 figures