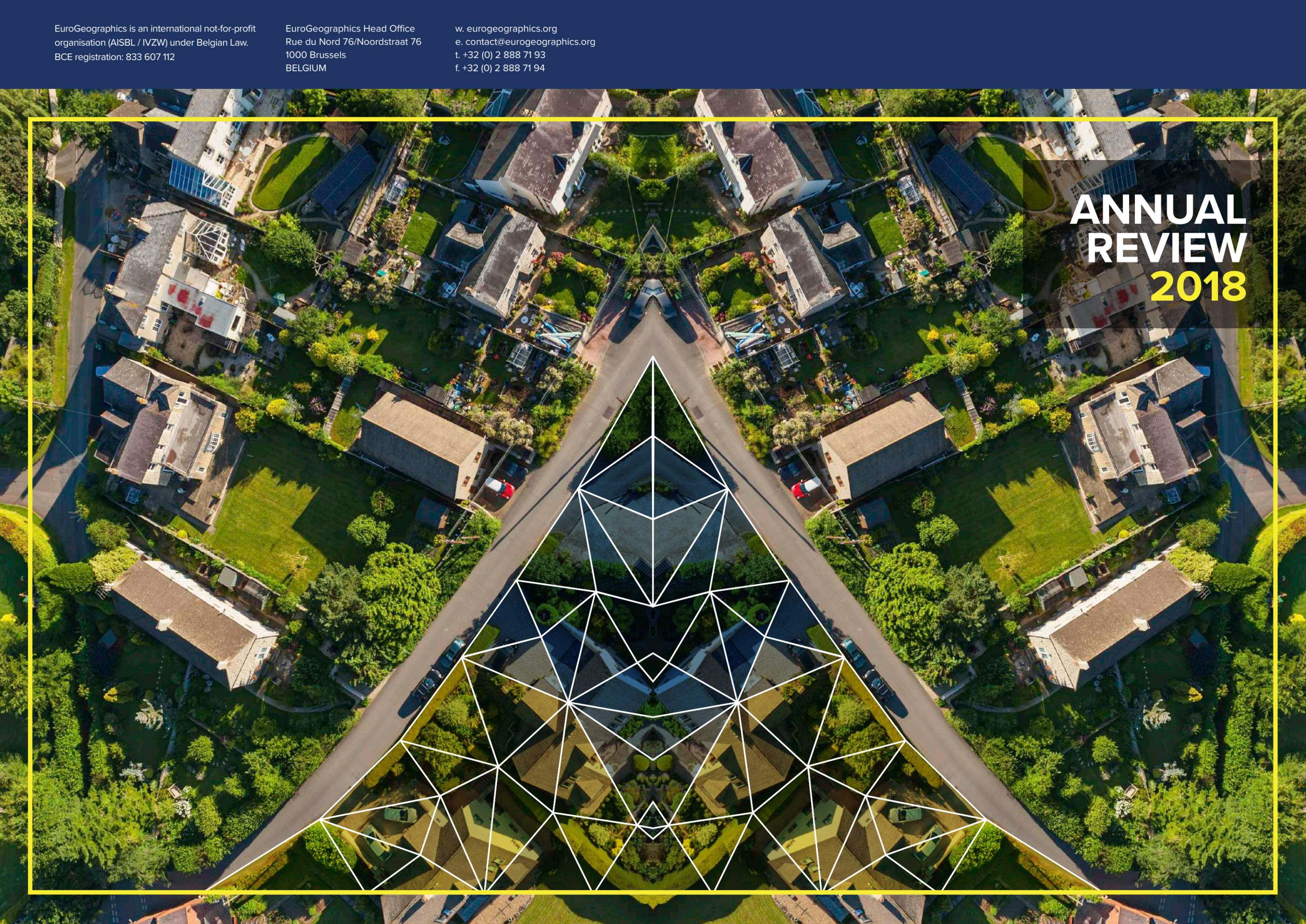


EuroGeographics is an international not-for-profit organisation (AISBL / IVZW) under Belgian Law.
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An aerial photograph of a residential neighborhood, featuring houses, green lawns, and trees. A central road runs vertically through the middle. Overlaid on this road is a white geometric pattern of interconnected lines, forming a series of triangles and polygons that expand outwards from the center. The overall image has a yellow border.

ANNUAL REVIEW 2018

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OUR MEMBERS

Our members are the National Mapping, Cadastral and Land Registration Authorities in Europe.

We currently represent around 90% of the official bodies responsible for geodetic surveying, topographic mapping, cadastral surveys and land registration, with at least one national authority in each country in geographical Europe.

EuroGeographics' members fulfil an essential role providing official, definitive and detailed geospatial information. These are underpinned by professional, scientific and technical expertise and support a wide range of requirements for national decision making, including positioning, navigation and emergency response.

By simplifying access to their data, members are driving applications to realise a wide range of social, economic and environmental benefits, as well as quicker, more efficient, secure and reliable land registration in support of an equitable property market.

A full list of our members can be found on pages 53 and 54.



PRESIDENT'S REPORT

EuroGeographics is proud to be the voice of European National Mapping, Cadastral and Land Registry Authorities (NMCAs)



In 2018, we marked 18 years of representing these official national sources of geospatial information.

Much has changed since the Association was first established in 2000. The political, social and economic environment in which we operate continues to change rapidly, which clearly creates new challenges but more importantly unparalleled opportunities.

Reports indicate that demand for geospatial information will grow by 13.6% between 2017 and 2020¹, with businesses using geospatial information growing by up to 10- 15% faster than those that do not².

There is no doubt that government, businesses and citizens continue to need our members' trusted, authoritative, geospatial data. However in this information age, with the ever-increasing pace of change due to disruptive technologies and with the emergence of many new alternative sources of geospatial data, it is recognised that NMCAs, similar to almost all other industries, cannot continue doing things in the same way as they have been done before.

We must continue to respond to change, and grasp the opportunities that change brings. We must ensure we understand what drives user demands, both now and in the future; that users recognise the value and benefits of our members' authoritative geospatial information; and that it is as easy as possible to find and use.

Access to various open data is a great first step in discovering the potential of NMCA information and almost all EuroGeographics members provide some form of their data in such an open format.

EuroGeographics open data product, EuroGlobalMap, has introduced many users to the benefits of authoritative pan-European mapping already. The Open ELS Project demonstrates this potential further.

These are just two ways in which EuroGeographics continues to connect users to maps, geospatial and land information for Europe. In doing so, we aim to show the value of using authoritative European geospatial information, an essential part in securing the sustainability of European national geospatial services so that NMCAs are recognised for their contribution to the public good.

I have great pleasure in introducing this review of our joint activities in 2018 which demonstrate how we are working together across Europe to realise our vision of a society empowered by the use of trusted geospatial services from official national sources.

I would like to take this opportunity to acknowledge and thank our Immediate Past-President, Ingrid Vanden Berghe, who stepped down in October 2018. Ingrid had been our EuroGeographics President since 2011 and contributed so much to the development of our great organisation. I would also like to thank our Secretary General and Executive Director, Mick Cory, and his great team in Head Office for all their hard work and support.

Colin Bray
President, EuroGeographics

¹ GeoBuiz 2018 Report: Geospatial Industry Outlook and Readiness Index

² The Socio Economic Impact of Open ELS, Deloitte November 2018



ABOUT US

EuroGeographics - Connecting you to maps, geospatial and land information for Europe



EuroGeographics is an independent international not-for-profit organisation representing Europe's National Mapping, Cadastral and Land Registration Authorities (NMCAs).

Our strength lies in our extensive membership and we are proud to represent more than 60 organisations from 46 countries covering the whole of geographical Europe. We deliver benefits for each regardless of the geographical, technical, political, organisational, linguistic and business parameters in which they work.

Our vision is for a society empowered by our members geospatial data and services. EuroGeographics supports the public good by representing our members' interests, maintaining networks that help our members improve their capabilities and role, and by facilitating access to and use of our members' geospatial data and services. By providing a single point of contact, we enable government, business and citizens to benefit from their collective expertise, products and services.

Secretary General & Executive Director's Report

EuroGeographics represents our members' interests, maintains networks that help our members improve their capabilities and role, and facilitates access to our members' geospatial data and services.

As a passionate advocate for European geospatial data from official national sources, we provide a strong, independent voice to support our members in making this case to their national governments, as well as internationally through our wide networks and partnerships. In this way EuroGeographics, as a not-for-profit International body, is committed to supporting the public good.

Representation

Our representation activity is based upon the principle of constructive participation. We engage with policy makers, legislators and service providers to ensure that our members' roles, capabilities and concerns are understood, and the value of their data recognised. We are registered on the European Union (EU) Transparency Register and are bound by its code of conduct.

Whilst around a third of our members operate outside the European Union, its policies affect all our member organisations. During the past year we have tracked and responded to significant developments, in particular, the European Commission's proposal for the recasting of the Directive on the Re-use of Public Sector Information. We now look forward to the opportunities arising in 2019 from new geospatial legislation, as well as a new European Commission and Parliament.

Our work at the United Nations (UN) ensures that the collective voice of European NMCAs is heard on the global stage. We do this as an observer organisation at the UN Global Geospatial Information Management (UN-GGIM) Committee of Experts and as an observer on the UN-GGIM: Europe Executive Committee.

In 2018, we actively participated in GGIM8 at the UN's Headquarters in New York where we highlighted our members' support and contribution to the UN-GGIM work programme, and reminded delegates of the expertise that exists within our members through our Knowledge Exchange Networks (KENS).

Knowledge Exchange

Our KENS are designed to help members improve their capabilities and role. As a forum for discussing issues of mutual interest, they demonstrate the tremendous value our members place on collaborating to find solutions to common challenges as well as their willingness to share experiences and best practice.

During the year we organised a comprehensive calendar of knowledge exchange events. These included a programme of dedicated workshops on funding and disruptive technologies, an international conference on quality, support for cadastral and land registry activities in collaboration with the Permanent Committee on Cadastre (PCC) and a communications workshop on international geodetic activity. We also collaborate with organisations that have common interests, complementary expertise and programmes of work which support our members' activities and promotes them to a wider, yet relevant, audience.

Facilitating access to our members data

We facilitate access to our members' data and promote its importance by delivering European geospatial products and services, and through our developing vision for European location services. Both focus on enabling international cross-border applications that complement the national activities of our members.

Our products are harmonised to standard specifications, so users can be confident that the information provided is consistent, comparable and easily shared — regardless of its national source. We offer standardised, transparent pricing and licensing agreements, including an open data licence for EuroGlobalMap which is produced with support from The National Institute of Geographic and Forest Information (IGN France). A new version of this 1:1 million topographic dataset was launched in 2018 to include fields for the Trans-European Transport Network (TEN-T).

We also enhanced our dataset of official administrative boundaries of Europe (EuroBoundaryMap) and our multi-themed topographic mapping (EuroRegionalMap), which are both managed by Germany's Federal Agency for Cartography and Geodesy (BKG) on behalf of our members. As a result, EuroBoundaryMap offers the latest official administrative and statistical information for 55 countries — from the most detailed local level to country level, and following the addition of Croatia, EuroRegionalMap now provides full coverage of the EU 28.

We believe there are many benefits for users and for society in having harmonised, pan-European, authoritative geospatial information and services. The Open ELS Project, co-financed by the European Union's Connecting Europe Facility, demonstrates this potential. The project has developed demonstration and test services of open data from our members. It has a programme of activities for helping to develop Europe's digital economy through engaging with small and medium enterprises (SMEs) to encourage their take up of official geospatial information. EuroGeographics is coordinating this two-year project, which ended in April 2019, working with members from Norway, The Netherlands, Great Britain, Finland, Spain, Sweden, Poland and Germany.

EuroGeographics' strength lies in our members' willingness to work together in a collaborative way to deliver wider benefits in support of the public good. As a result, we can look forward to the next 12 months with optimism and confidence as we work towards our ambition of a society empowered by the use of trusted geospatial services from official national sources.

Mick Cory
Secretary General and Executive Director
EuroGeographics

A FEW HIGHLIGHTS FROM 2018



Representation

United Nations

We were pleased to participate in GGIM8 at UN Headquarters in New York where our Secretary General and Executive Director, Mick Cory made a series of interventions highlighting members' contributions, particularly in the work of UN-GGIM: Europe. He also reiterated EuroGeographics support for initiatives to strengthen geospatial information management, the global geodetic reference frame, and the implementation and adoption of standards, reminding delegates of the expertise within our Knowledge Exchange Networks (KENS).



DGI 2018

EuroGeographics chaired a panel of members from Belgium, Germany and Great Britain at DGI 2018, Europe's largest defence and government geospatial intelligence conference. Discussions focused on how technology such as artificial intelligence and machine learning impacts on the work of members.

Regional and international collaboration

During the year we participated in a number of regional and international collaborative groups, such as in the Western Balkans at Budva, Montenegro, and the EuroSDR Board of Delegates in Ljubljana, Slovenia. We also established and maintained relations and communication with relevant organisations, such as the European Forum for Geospatial Statistics (EFGS) and the Group for Earth Observation (GEO).

PSI Directive

On behalf of members, we submitted EuroGeographics' position on the proposal for the recasting of the Directive on the Re-use of Public Sector Information. We did this through our participation in the Commission's online survey, consulting on the expected outcomes and potential impact on members, and developing an Information Paper, which was distributed among relevant Members of the European Parliament. In addition to a briefing paper, we also organised meetings and workshops for members.

United Nations World Geospatial Information Congress (UNWVIC)

Together with many of our members, EuroGeographics was pleased to contribute to the United Nations World Geospatial Information Congress (UNWVIC) in Deqing, Zhejiang Province, China which focused on strengthening national geospatial information management and systems, as well as national implementation of the 2030 Agenda for Sustainable Development

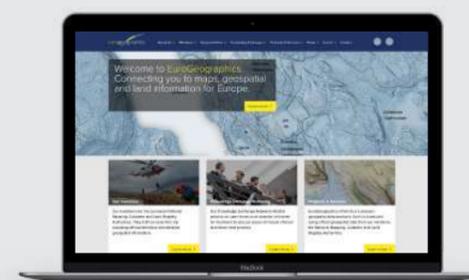
SEMIC & INSPIRE conferences

EuroGeographics was delighted to attend in the SEMIC conference which took place in Sofia, Bulgaria and the 11th INSPIRE conference in Antwerp, Belgium, where our contributions focused on authoritative open data and putting users at the centre of European location services.

UN-GGIM: Europe

EuroGeographics is an observer on the UN-GGIM Europe Executive Committee and was pleased to participate in the 5th Plenary held in Brussels. We also signed a revised Service Level Agreement (SLA) with Kadaster Netherlands to continue to provide the Secretariat until 2020.

Knowledge Exchange



New website & corporate branding

Our new website went live at www.eurogeographics.org, our revised branding was unveiled and a new format for the Members' newsletter was introduced.

Extraordinary General Assembly 2018

Representatives from 34 member organisations participated in our extended 2018 Extraordinary General Assembly in Leuven, Belgium. The meeting was followed by a development and funding workshop supported by the World Bank and UN-GGIM: Europe, and a workshop on disruptive technologies.

PosKEN Communications Workshop

The Positioning KEN held a communication workshop for geodesy and GNSS experts from NMCAs on the European activities related to positioning, and discussed common trends and opportunities for a collaboration amongst key players in Europe.



Joint meetings with PCC

EuroGeographics members were widely represented at the joint Cadastre and Land Registry KEN workshop with the PCC in Bulgaria which focused on data as a basis of the digital society. Later in 2018, a very successful joint PCC Plenary meeting and CLR KEN workshop was held in Vienna where delegates discussed the reliability of the Cadastre and latest development in cadastre and land registry.



General Assembly 2018

Our 2018 General Assembly in Prague provided an opportunity for high-level peer-to-peer knowledge exchange and to help shape the future of the Association so that it continues to deliver value to all members.

KENs

Our KENs, together with EuroGeographics Head Office, have continued to deliver an active programme of meetings, workshops and seminars. All have held meetings, workshops or webinars in the last 12 months.

International Workshop on Spatial Data Quality

The 2nd International Workshop on Spatial Data Quality, organised by EuroGeographics Quality KEN, EuroSDR, Open Geospatial Consortium (OGC) and International Organisation for Standardisation (ISO) Technical Committee (TC) 211 Geographic Information, was held in Malta.

Products & services

Production meetings

The Production Management Team and EuroGeographics Data Producers both met during 2018 to discuss the production process and share challenges and solutions.

Following a successful visit from EuroGeographics Head Office, our members from Belarus also met with BKG in Germany to discuss contributing to EuroBoundaryMap and EuroRegionalMap.



Production Management Team

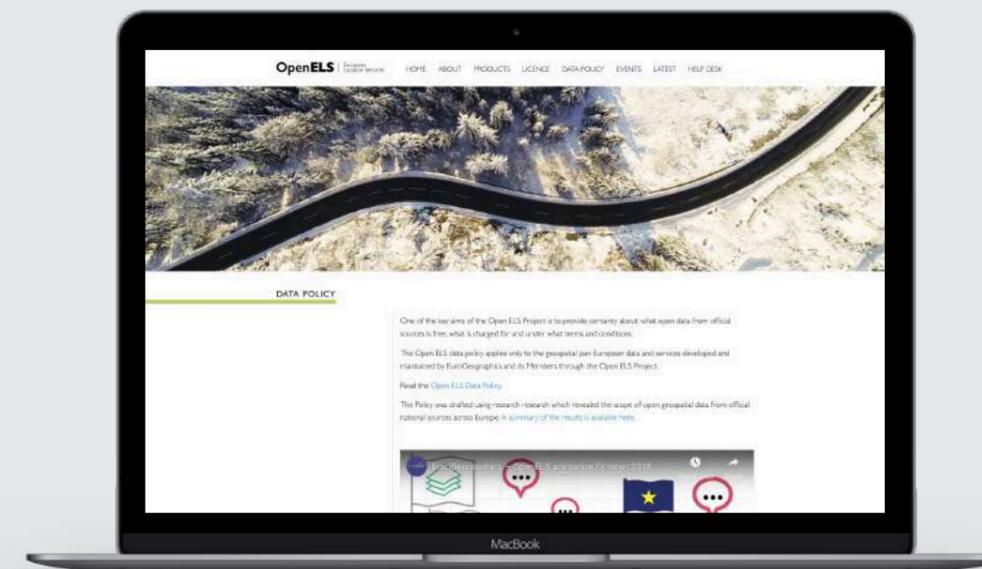
Product updates

To facilitate access to our members' data and to demonstrate its importance, EuroGeographics continues to maintain and develop its portfolio of pan-European datasets. In 2018, we have released updated versions EuroBoundaryMap; EuroRegionalMap; and EuroGlobalMap.

Eurostat agreement

We continued to deliver data to the European Commission through our agreement with Eurostat. During the year, we held a successful steering group meeting.

Open ELS Project



Open ELS website

 **Co-financed by the European Union**
Connecting Europe Facility

SME Engagement

Activities for engaging with SMEs started with a survey to assess interest and demand for geospatial open data from official national sources. It revealed that NMCAs are the most popular source of geospatial data among SMEs who use it to provide services to their customers, and that the overwhelming majority would be interested in the six open data services being developed.

Milestones

In 2018, the Project delivered a number of milestones including an Open ELS data policy, an Open ELS licence, and an updated data provider agreement for both Open ELS and European Location Services. It has also established a help desk to support processes or data contributors and defining capacity building activities.

MEMBERS' CASE STUDIES



Albania

Albania implements National Geodetic Reference Frame

Albania is one step closer to a national vertical reference system based on a local gravimetric geoid solution.

The project, being delivered by the State Authority for Geospatial Information (ASIG), is the first time gravimetric measurements have been realised in this way for geodetic purposes.

A complex campaign of relative gravimetric measurements was carried out, initially for 42 points, followed by a further 38 point and then 133 points. These investigations were carried out in combination with the physical construction of the GNSS network of 42 active and passive points, which includes 21 stations in the ALBCORS project. Another key achievement for ASIG was the installation of two Tide Gauge stations which marked the accomplishment of Tide Gauge Network. As a result, the Albanian coast now has four tide gauges (Sarandë, Orikum, Durrës, Gjengjin) that enables the monitoring of Adriatic and Ionian Sea.

ASIG also conducted a campaign of measurements for the magnetic components of the Magnetic Network (Epoch 2017.5, 11 Repeat Stations) based on European standards.

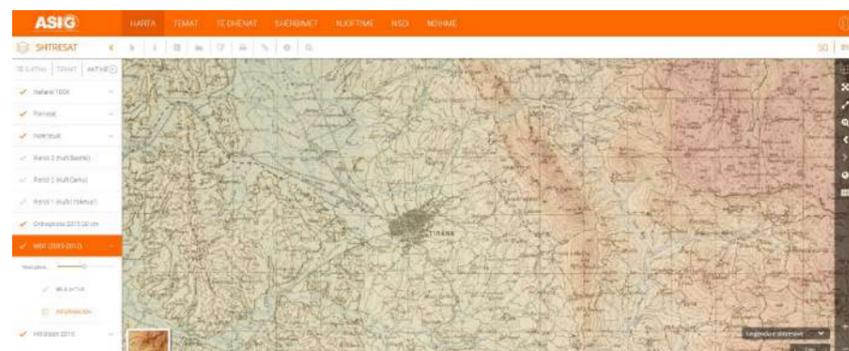
Widening access and use of authoritative geospatial information

In its role of administrator for the national geoportal – <https://geoportal.asig.gov.al> – ASIG has increased the number of web mapping services (WMS) available to the public. The 191 WMS now also feature urban planning, the 3-dimensional field model of 2015 and historical maps (1935-1990). In addition, the integration of the national Web-GIS systems enables the display of live data for cultural monuments and the immovable property registration system.

These developments fulfil ASIG's objective of widening access and use of geo-information, with the national geoportal receiving around 1,000 visits a day and the number of registered Government users reaching 600.

Drafting standards

ASIG is responsible for drafting national standards for geoinformation. In 2018, themes for Land Cover, Natural Risk Zones, Population Distribution, Sea Regions, Statistical Units, Mineral Resources, Energy Resources; Utility and Government Services were drafted based on the standards of the INSPIRE Directive.



Austria

Austria takes another step towards digitalising the cadastral maintenance process

Maintenance of the Austrian cadastre is organised through a public-private cooperation model between the Federal Office of Metrology and Surveying (BEV) and licensed private surveyors under the authority of BEV.

In 2018 BEV introduced a process to generate an electronic data flow allowing automatic analysis and processing of surveying documents.

Approximately 37,000 surveying documents (plans) are submitted annually to BEV's 41 local cadastral offices. The majority of these plans need to be authorised by BEV with a certificate confirming they are correct so that they can be used by the land registry court for decision-making. Following a positive land register decision, these documents are implemented into the cadastre by the cadastral office. Other kinds of surveying documents are used to update the cadastre by the surveying authority itself immediately after positive verification.

Since 2012, there has been a consistent digital transmission of surveying documents starting from submission to the cadastral office to the district court (land register). The surveying documents are submitted in an electronic



document file format (PDF/A-1b) fit for long-term archiving, digitally signed and archived in the cadastral register. As it is only available in a digitally unstructured PDF format, the content cannot be automatically analysed and further processed. Entering the data into the cadastral maintenance system, therefore requires manual transformation and integration into the cadastral maintenance system by the cadastral office. Even variety of tests during the process may leave some errors undetected.

To overcome this and to improve the digital process, the textual parts of the document (surveying plans and other supplements) are stored in PDF form fields with given field names to allow fully automated formal validation of the structured content. In terms of the surveying plan, a BEV-module

extracts and analyses the data and compares them with the legal status in the cadastre. The author may carry out a non-binding automatic pre-validation of the documents prior to application and is informed about deficiencies and inconsistencies via an automatically generated report, allowing corrections to be made and the resubmission of the application. As a result, the data are then transferred to the cadastral maintenance system as the basis of the business case.

The submission of structured documents was introduced on 1 October 2018, operating in parallel with the previous system. During the first three months, 36 surveying documents were submitted to BEV based on the new PDF using form fields.

Belgium

eGovernment-award for the collaboration of the emergency services in Belgium

The NATO summit in July 2018 was an event of unparalleled security proportions in Belgium.

To provide a common operational picture for all the services involved, the National Geographical Institute (NGI) provided a digital basemap for real-time viewing of vital information.

This multidisciplinary and unambiguous overview of events in Brussels was indispensable to the Crisis Centre and the other services, such as the police, fire brigades, FPS Health, NATO, Foreign Affairs, the Chancellery of the Prime Minister, and Defence. It was the first time all strategically and operationally relevant information, including the real-time location of the 60 heads of government and VIPs, police, fire brigade, ambulances, incidents and their spatial impact, travel routes and perimeters, had been brought together on the NGI's digital basemap to enable collaboration between command centres and other organisations in the city.

NGI managed overall project management and governance by defining the functional requirements of the system with stakeholders. It also adapted its digital basemap for use in a dense urban environment; provided a paper version and index, which was used intensively by the reinforced police; searched for and uploaded relevant thematic information layers; and created the test plan and tested the solution.



In addition, NGI made the necessary hardware available and organised training courses in the use of the geotool, the tracers and its management.

NGI was relied upon to provide this essential tool for logistics and safety as it had already proven that it could involve such stakeholders in a complex setting through the Cartography for Wildfires project. Although developed initially for the NATO summit, the award-winning solution demonstrates that multidisciplinary collaboration is possible thereby refuting the arguments against such cooperation. NGI and Crisis Centre continue to collaborate, in order to achieve a fully geo-enabled resilience approach.



Image courtesy of NATO

Bosnia & Herzegovina

Improving land administration in Bosnia and Herzegovina

New client-oriented data and products based on international and EU standards are contributing to land administration reforms in Bosnia and Herzegovina (BiH).

As the central distribution point for such information, the Federal Administration for Geodetic and Real Property Affairs (FGA) continues to improve the availability, accessibility and efficiency of land administration data and services. These are an essential component of the infrastructure benefitting government, the private and academic sector, as well as the general public through the provision of more accurate, and reliable real estate.

By the end of 2018, 1.82 million land registry folios had been incorporated in the electronic land registry of the Federation of BiH thanks to the systematic harmonisation of real estate data between the land registry and the cadastre. As a result of the project, funded by the World Bank, 51.5% of these folios are now based on the new cadastral survey as opposed to 30% at the start.

New orthoimagery products, based on satellite imagery and financed by the government of the Federation of BiH, were also introduced in 2018. One provides national coverage at 40 cm resolution, and the other 30 cm resolution for urban areas.

Following the establishment of IT system used by local tax authorities and municipal staff, the Sales Price Register (SPR) data was published for public and other users and more than 12,000 individual transactions have been displayed publicly on the FGA geoportal.

FGA, as the government appointed institution for the coordination of Spatial Data Infrastructure (SDI), continues to collaborate with key stakeholders to implement strategy and, in the past year, completed a joint platform for administering SDI metadata.



IPP FBiH | INSPIRE | Zakonski akti i strategije | Vijeće IPP FBiH | IMPULS projekt | Katalog metapodataka IPP FBiH | Kontakt | Linkovi | Besplatni



Croatia

Digitising Croatia's Cadastral System to meet user needs

Digitalisation of the cadastral system in Croatia is improving data quality, processes and distribution.

The State Geodetic Administration (SGA), which is under the jurisdiction of the Ministry of Construction and Urban Planning, is undertaking the work to deliver fully digital business operations to meet the requirements of the EU and the national government. It is responsible for cadastral maps and related data, which are maintained via 20 regional cadastral offices and 92 branch offices.

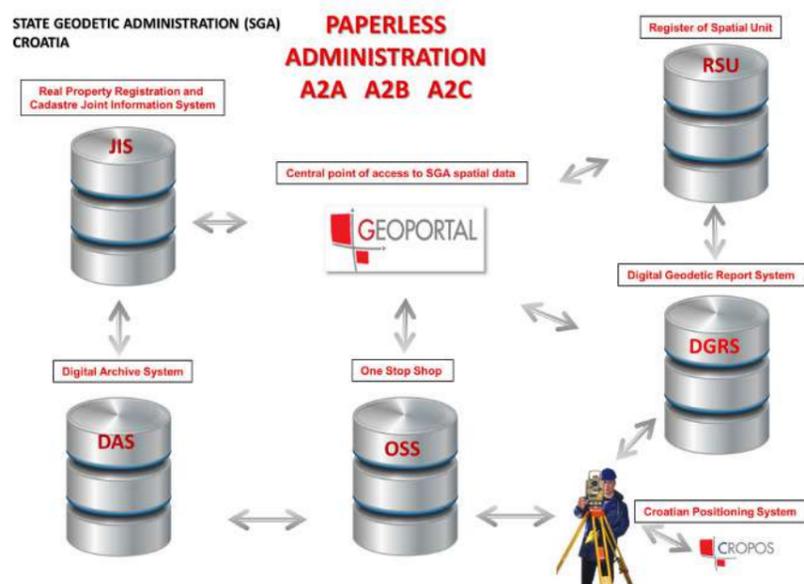
The Ministry of Justice is responsible for registration of ownership and other real property rights (land registers). Land registers are kept and maintained by 107 land registry offices at 22 municipal courts (land registries).

With SGA running many programs to standardise technological and organisational aspects of the cadastral system, it is vital that guidelines are provided to civil servants and private sector users. SGA has developed and interlinked IT systems, improved data quality and trained its own staff as well as external users to assist the transition. In addition, it has implemented projects to raise data quality and developed many services for data distribution, sharing

and exchange. Legislative changes for the coordinate cadastre were also introduced in 2018. Other achievements include the delivery of actual (surveyed) coordinates in real time using the Croatian Positioning System (CROPOS).

To meet all preconditions for fully digital business operations, SGA has established a unified database and application for keeping and maintaining the land registry and cadastre data. This Real Property Registration and Cadastre Joint Information System (JIS) allows digitally produced geodetic reports to be received while digital business processes have been revised. A geoportal provides a central point of access to SGA spatial data and enables the electronic issue of public deeds (cadastral map copies, possessory sheet transcript/extract and Land Database extract) through a One Stop Shop (OSS).

Self-service and free data searching and downloading is also available for the purpose of producing digital geodetic reports. The Digital Geodetic Report System (DGRS) enables additional electronic business operations to be performed by the SGA and licensed geodetic firms, allowing data for geodetic reports to be captured electronically, produced in digital form, and then electronically submitted to the cadastral office. More than 12 million pages of geodetic reports can also be viewed in the Digital Archive System (DAS).



Cyprus

Pioneering online platform for Cyprus wins prestigious Innovation Award

A pioneering online services platform developed by the Department of Lands and Surveys has received one of Cyprus' highest distinctions.

The DLS Portal was named best Public Sector Innovation in the Federation of Employers and Industrialists (OEB) Innovation and Research Awards 2018.

The new online platform is a focal point in the history of the modern cadastre and the culmination of a long time effort of the Department to provide e-services to citizens via the Internet. It provides access to the Department's information and enables citizens to submit online applications, export data and catalogues, purchase maps, subscribe to services, and more.

The DLS Portal is the first and largest online electronic library of geographic and descriptive information in Cyprus, and is considered to be one of the best European cadastral and geospatial information providers. At the same time, it is a model for the implementation of the INSPIRE Directive and collects a multitude of geospatial data from various departments and services of the State. As the most important e-Government service offered by Cyprus, it reflects



the implementation of the new strategy adopted by the Department of Lands and Surveys in the fields of geospatial technology and IT which aim to stimulate and improve the economy.

Additional benefits include:

- Market and economy development
- Strengthening the real estate market and attracting new buyers
- Saving resources and time for the Department and citizens
- Improving public service, transparency, reducing bureaucracy and promoting equal treatment
- Strengthening the interoperability of data between IT applications
- Expanding Open Data
- Modernization of the operational functions of the Department

The award was presented to the Director of the Department, Mr Andreas Socratous by the President of the Republic of Cyprus, Mr Nikos Anastasiadis at a ceremony in November 2018. The event was attended by the Honorable Minister of Interior, Mr Constantinos Petrides and the Permanent Secretary of the Ministry of the Interior, Mr Kypros Kyprianou, Ministers, MPs, politicians and other state officials.

Czech Republic

Joint anniversary celebrations in the Czech Republic

In 2018, the Czech Republic celebrated 100 years since the establishment of independent Czechoslovakia, whilst also marking the 25th anniversary of the land surveying and cadastre branch.

To commemorate the transfer of the cadastral system of Austria-Hungary, as well as the start of a new chapter in land surveying for the newly established state, a special publication was issued for a conference dedicated to the centenary. As well as mapping the historical development of geospatial activities in the public interest and the institutional arrangements of previous similar civilian spheres, this also included professional biographies of prominent personalities who have contributed to land surveying activities.

The Czechoslovakian cadastre was built in 1918 on a functioning system of land books and cadastre but required modernisation and unification to benefit the new state. However, the Second World War disrupted this successful process, and bankruptcy continued practically until the early 1990s. In 1993, after the establishment of the independent Czech Republic, a long-term concept was adopted which



combined the digitisation of records of ownership and other material rights with cadastral maps in one database – a process which required the control and compilation of data from different sources.

This process, including digitisation of cadastral maps which progressed relatively slowly, was successfully completed in 2017. It ensures easy access to information on real estate, smooth and rapid registration of rights in the real estate cadastre, and promotes the use of cadastral information in geoinformation systems of public administration. The system benefits both the public and the entire state administration for which the information provided by the land surveying and cadastre branch is reliable, up-to-date and easily accessible.

Today, the land surveying and cadastre branch is working on completing another long-term task; the accuracy and timeliness of the cadastre and land surveying products to promote the quality of authoritative data so that it is the first choice for professionals, as well as the general public. It is also linking its information system with other sources of data to increase the quality and timeliness of the outputs provided.

Denmark

Denmark from above – launch of first national database of oblique aerial photos

In 2018 a nationwide database of oblique aerial photos covering Denmark was released, enabling the public and professionals to study the ground surface and building facades from all over the country from oblique angles.

The oblique dataset provides national coverage for the first time and contains a total of 1.3 million high-resolution photos available as free and open data.

The launch clearly showed that there is an interest and demand for oblique photos.

On the first day of the announcement in September 2018, the dataset received 40 million requests. By the end of the year, 166 million requests had been made. The dataset is accessed via www.skraafoto.kortforsyningen.dk

The dataset is initially aimed at supporting the property taxation system with visual information on the condition of buildings for the purpose of taxation – but the expected applications are much broader. As well as supporting many other branches of public administration, the private sector will also profit from the new and homogeneous dataset.

Potential public applications include local planning, building permits, and new solutions for visualisations and 3D urban models. Within the private sector architects, real estate agencies and insurance companies can benefit from the dataset. To support wide use, the oblique photos are available as free data that can be freely downloaded and used without restrictions by companies and citizens.

It is expected that the oblique photos will deliver efficiency gains in several industries. The oblique photo solution can replace or supplement physical inspections across Denmark. Providing the users with a tool for studying buildings and structures from above, as well as from four angles, makes it possible to make detailed assessments and inspections without the need for on-site visits.

The oblique photo solution contributes to the Agency for Data Supply and Efficiency's (SDFE) strategic goal of supplying a digital data foundation for growth in society. As they are free, public and private companies get a unique starting point for using oblique photos to develop new solutions or services. SDFE's strategic goal of creating added value in governmental management processes and freeing up time and money in public administrative processes, is also achieved by replacing time-consuming physical inspections with easy digital access to photos.



Estonia

High quality spatial information available as open data in Estonia

High quality national spatial information is now available as open data through an initiative launched by the Estonian Land Board in July 2018.

To better meet user demands, the data includes cadastral and topographic data, including LIDAR scanning data and orthophotos.

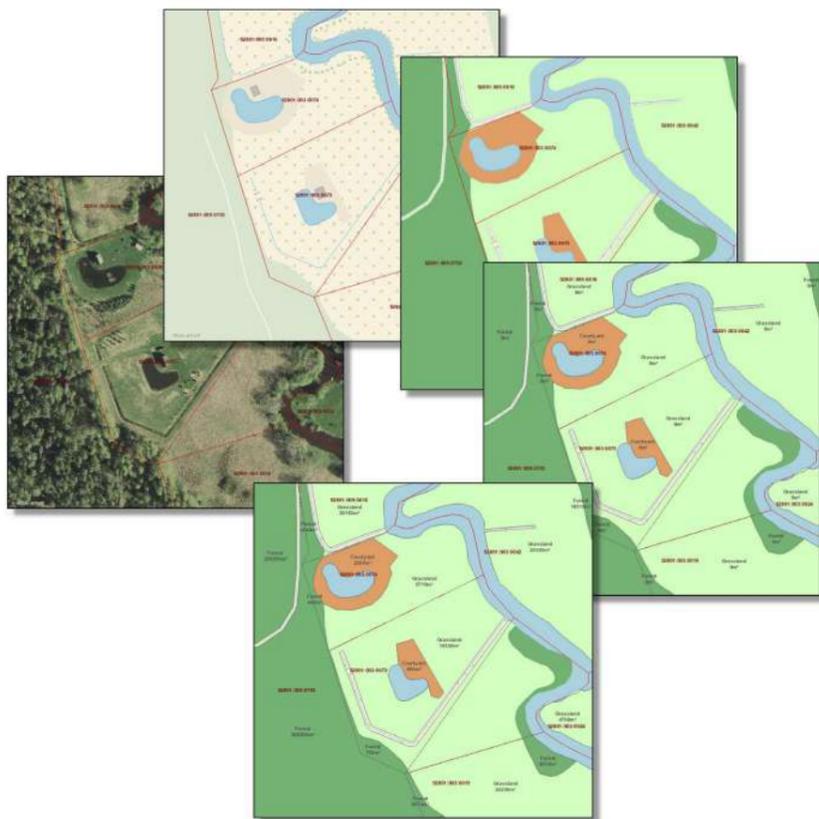
Since being established in 2006, the Estonian Topographic Database (ETD) has been continuously updated using aerial photogrammetry, LIDAR scanning and stereo mapping. One of its many objectives is to provide state and local government databases with topographic spatial data for the objects managed within them. To date, it has successfully met the needs of the Road Register, Address Data System and Environmental Register.

The Land Board, however still faced a major challenge in improving the use of topographic data in the Land Cadastre. As a prerequisite, amendments in legislation were required, as well as changes in work processes and information systems to ensure flawless data exchange. At the same time, the land cadastre underwent a fundamental

change by shifting from parcel-based procedures to a point-based cadastre. All cadastral procedures are now paper-free and based on digital files. Digital archive is able to store the full life cycles of electronic documents.

Landowners benefit from the improved data quality and simplified procedures with the point-based system enabling partial surveying of the parcel. Whilst changing the location of a boundary point affects all adjacent cadastral

parcels, the cadastral registrar is entitled to correct cadastral data based on the topographic database. Therefore from 2019, the land cover data for each parcel will be determined from topographic data. The aim is that the landowners' feedback on land cover data will launch the largest crowd-sourced spatial data verification project in the history of the topographic database, thus further improving the quality of spatial data.



Finland

Creating a more efficient location information infrastructure for Finnish society

The National Land Survey of Finland is contributing to two major governmental projects that are creating a more efficient location information infrastructure for society.

It is working with the Ministry of Agriculture and Forestry and other governmental agencies on The Report on Spatial Data Policy (RSDP) as well as a national geospatial platform.

The RSDP was approved by the Parliament at the end of October 2018. It sets out a spatial vision for Finland as well as guidelines for future GI policy. The goal is to deliver the most innovative and secure spatial data ecosystem in the world. To achieve this, the report has defined the public sector's responsibilities and roles to ensure the efficient and timely production, maintenance and use of spatial data within public sector. It also addresses the protection of personal data and society's comprehensive security.



The potential and realised benefits of the use of spatial data in built environment

The final phase of the RSDP will be developing an action plan and putting it into practice.

The report is available in Finnish, Swedish and English at <https://mmm.fi/paikkatietoselonteko>.

The Geospatial Platform collects spatial information from the public administration to make it available to users. It is being built within the common spatial data platform project. The aim is to harmonise and extensively improve the e-services provided; to improve data-based decision-making; to increase transparency; and to save costs. The first pilot version is already in place with limited services at <http://beta.paikkatietoalusta.fi>.

The results so far include:

- The economic value of spatially enabled services in Finland, including the impact of the Geospatial Platform (Spatineo 2018).
- Common specifications for the maintenance of spatial data: Buildings, addresses, traffic network, hydrography, land cover and use.
- National access for EU satellite data
- Common quality rules and automated quality guard service for data providers. This work is building from the ESDIN and ELF projects.
- Intelligent metadata search, including Google search.
- Approach for innovation through the Geospatial hub concept.
- Modern APIs (i.e. WFS3).

France

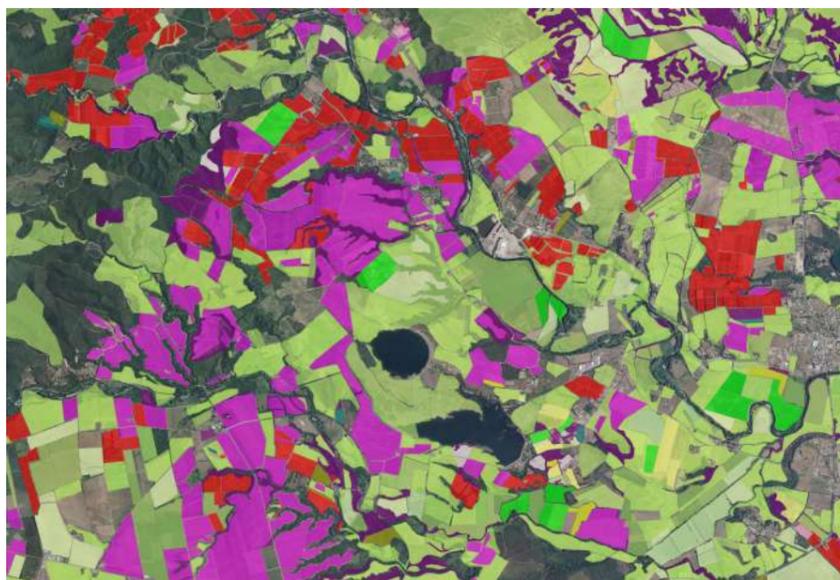
Geoplatform: France's public space for geographic information

Together with its partners, the National Institute of Geographic and Forest Information (IGN-F) is building a Geoplatform as a public space for geographic information.

The aim is to provide officials and citizens with an open, collaborative and shared infrastructure that brings together communities and uses through geo-located data and services.

The Geoplatform is an opportunity to streamline existing infrastructures by avoiding duplication while enhancing the quality and efficiency of the production, processing and dissemination of geographic information. By improving the territorial approach of public policies, it meets the French government's strategy to build Government as a Platform, and has been awarded €3.6 million by the call for proposals from the Fund for Transforming Public Action.

The open governance of the Geoplatform promotes the emergence of standards and common specifications. By connecting with artificial intelligence or augmented reality, it will also enrich existing services,



design new ones and develop the uses of geo-located data. New services will be jointly created, shared with, or even led by partners, enabling them to better cross-reference and promote the value of their geographic data and associated API services.

To ensure that it focuses on the collective interest and use of geographic information to meet specific user needs, the Geoplatform is built on three essential pillars:

- An open and mutualised platform, consisting of a catalogue of data, processing tools, generic applications, learning databases and algorithms which will all be available online through APIs.
- An ecosystem of uses and communities, bringing together users

and producers of data and services that can be federated around themes, such as urban planning and tourism, or technical communities.

- Collaborative solutions (crowd and community sourcing) for maintaining and enriching authoritative geographic data. Based on a principle of shared databases between public institutions and within the civil sphere, this innovative mechanism of pooling enrichments and data updates enables savings in resources for both IGN-F and partners, as well as improved data quality.

IGN-F is encouraging any interested stakeholder to become a Geoplatform partner.

Georgia

Delivering new high-quality basic geodata for Georgia

The National Agency of Public Registry (NAPR) is among the largest owners and providers of spatial information in Georgia and takes the lead in processes related to geodata.

Operating under the Ministry of Justice, the government agency is responsible for land administration, cadastre, addresses, geodesy and mapping. It is also National Coordinator for development and maintenance of the National Spatial Data Infrastructure (NSDI) for which accurate and reliable geospatial information is critical.

To overcome a lack of accurate, up-to-date, harmonised essential digital geographic datasets, NAPR worked with the Norwegian Mapping Authority (Statens Kartverk) on the three-year Maps for Sustainable Land Management: Georgia Orthophoto project. Completed in May 2018, the large-scale initiative was supported by the Norwegian government and delivered new high quality orthophoto imagery and a Digital Terrain Model (DTM) for almost all Georgia.

As a thematic continuation of this work, a second project to develop digital base maps (vector maps) from the data produced was launched in 2018 with support from Norway. It marks a further step towards the development of a well-functioning NSDI with these up-to-date and accurate maps providing the basis for adding different data layers such as hydrography, road network and tourism.

These geodata are of nationwide importance. They are useful not only for NAPR to effectively fulfill its responsibilities and provide a quality service to customers, but also for other public institutions for planning, risk assessment, informed decision making and implementation of various activities from infrastructure projects and environment protection measures to agricultural projects, managing communication and aerial navigation systems. Consequently, they will support good governance, economic growth, and efficient environmental and social management in the country.



Germany

Using geospatial data for calculating the SDG indicators

The Federal Agency for Cartography and Geodesy (BKG) is responsible for calculating the SDG indicator 15.4.2 “Mountain Green Cover Index” for the German national indicator report.

In September 2015, the United Nation’s Agenda 2030 for Sustainable Development, including the Sustainable Development Goals (SDGs), was adopted by the heads of state and government. The SDGs consist of 17 goals, subdivided into 169 targets, and address major social, environmental and economic challenges for the next 15 years. National progress of their implementation is measured and assessed using 232 quantitative indicators.

BKG, in cooperation with the Federal Statistical Office of Germany, has conducted feasibility studies regarding the calculation of selected SDG indicators. This activity is part of BKG’s research projects ‘Cop4SDGs’ (verification and monitoring of the SDGs using Copernicus data, a project in co-operation with the German Environment Agency) and ‘LaVerDi’, a project developing a land cover change detection web service for Germany.

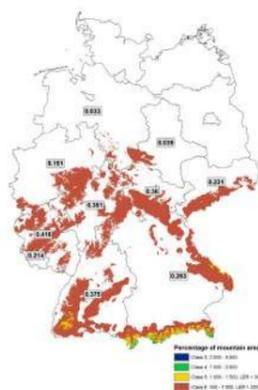
One of the indicators in the studies is 15.4.2 “Mountain Green Cover Index” which expresses the percentage of vegetation on mountainous landscapes. This indicator contributes to the achievement of SDG 15 (life on land), and, more specifically, the conservation of mountain ecosystems including their biodiversity. According to the definition of the custodian agency (FAO - Food and Agriculture Organisation), trees, meadows, shrubs and agricultural fields are considered as vegetation for the calculation of this indicator. The vegetation covered mountainous landscapes are classified according to their elevation, inclination and their mountain class.

For calculating this indicator, BKG uses remote sensing images from Sentinel-1 and -2 as well as geospatial data from the German Digital Terrain Model (DGM-DE) and the Land Cover Model of Germany (LBM-DE). The calculations indicate that 18.6 % of Germany is covered by mountainous landscapes and 96.2 % of these mountainous landscapes are covered with vegetation.

After a joint evaluation of the method and results of this indicator with the Federal Statistical Office, BKG has been assigned with the responsibility of calculating the SDG indicator 15.4.2 in the future and will present these results in the official 2019 national monitoring report for the SDG indicators.



Image ©United Nations



Percentage of mountain area as per federal states



Mountain green cover index values shown as per their federal states (Laender)

Germany

National geocoding service for cadastral parcels

In addition to their clear spatial reference, parcels of land throughout Germany have a uniform 20-digit key.

Nevertheless, there is still no search engine that makes it possible to find parcels nationwide. The linking of factual and spatial information in times of digital maps is a standard task and decisive for spatial processing and visual analysis.

In the course of Digital Administration, German authorities are obliged pursuant 14 of the E-Government Act to provide new or revised registers relating to parcels with a coordinate so that the information in the registers can be displayed on digital maps.

As a member of the Working Committee of the Surveying Authorities of the Laender of the Federal Republic of Germany (AdV), the Federal Agency for Cartography and Geodesy

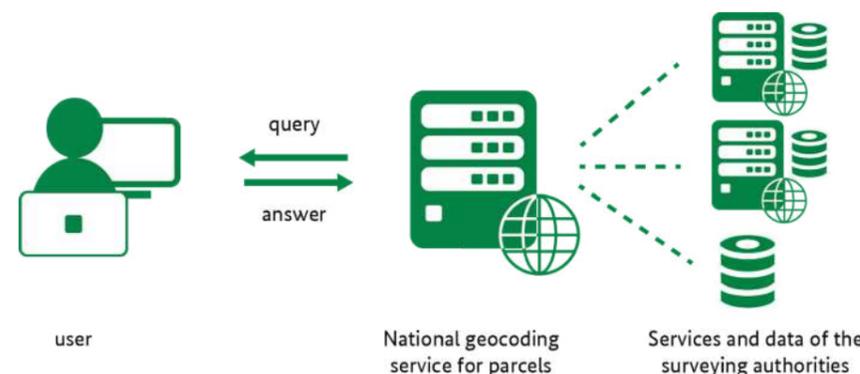
(BKG) is therefore working together with all the Laender of Germany on a nationwide solution. The goal is the development of a service for the geocoding of parcels, which enables the automatic search for parcels.

The challenge is to bring together the different services from a technical and legal point of view, as the responsibility for collecting and updating this data lies with the Laender. Nine Laender currently have appropriate services in place to support geocoding of parcels.

To reach a nationwide solution, the services must be bundled in a service cascade. The prerequisite for this is a common standard that harmonises the interface and the data model. The Web Feature Service (WFS) of the Open Geospatial Consortium (OGC) serves as the interface – a uniform data model is currently still being developed.

The provision of information via a service cascade is in line with AdV’s provisioning strategy. This first trend-setting solution represents a special challenge. At the Service Centre for Geoinformation and

Geodesy of the Federal Government in the BKG, a prototype is currently being developed which will bundle the various services and data of the Laender. In addition to the services of the Laender, alternative data sources from six other federal states based on the Real Estate Cadaster (ALKIS) are also used. The requirements of an organizational and licensing consideration of legal peculiarities at Laender level still have to be clarified with the Laender.



Great Britain

Unlocking the value of Geospatial

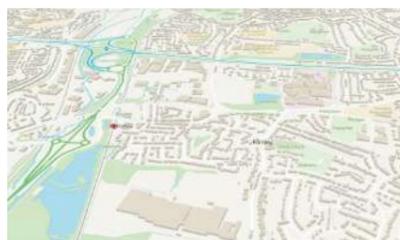
Ordnance Survey's key priorities have focused on discoverability, accessibility and usability over the past 12 months.

This has been in support of the, recently formed, Geospatial Commission objective to unlock up to £11 billion in extra value for the UK national economy each year.

Fundamental to meeting the objective is making key parts of OS MasterMap more accessible to start-ups, demonstrating OS's and the government's commitment to making the UK the best place in the world for innovative companies to turn data into ground-breaking new products and services.

An example of the economic benefits of geospatial data are being highlighted through Geovation. OS, with support from HM Land Registry, has played a leading role in delivering this ambition with its Geovation Hub. Since opening, the Hub has provided 84 fledgling businesses with specialist business support and funding through its programme. The Hub has been responsible for the creation of more than 200 new jobs and has helped the businesses involved secure in excess of £23 million in extra investment funding.

At the start of 2019 OS made its data even more accessible and easier to use with the release of OS Open Zoomstack,



a map making toolkit for developers. OS Open Zoomstack is the first release out of the Open MasterMap Implementation Programme.

In addition to the OS MasterMap programme, OS is working with the Geospatial Commission, and its other five partner bodies, to make it easier for



users to discover the data held by each organisation. In 2019 six catalogues were published listing the data each organisation holds. The OS catalogue alone holds over 1,200 datasets, ranging from rivers to roads.

2019 promises to be an exciting year with the global recognition of the value of geospatial data at an all-time high.

Great Britain

HM Land Registry lays groundwork for comprehensive registration

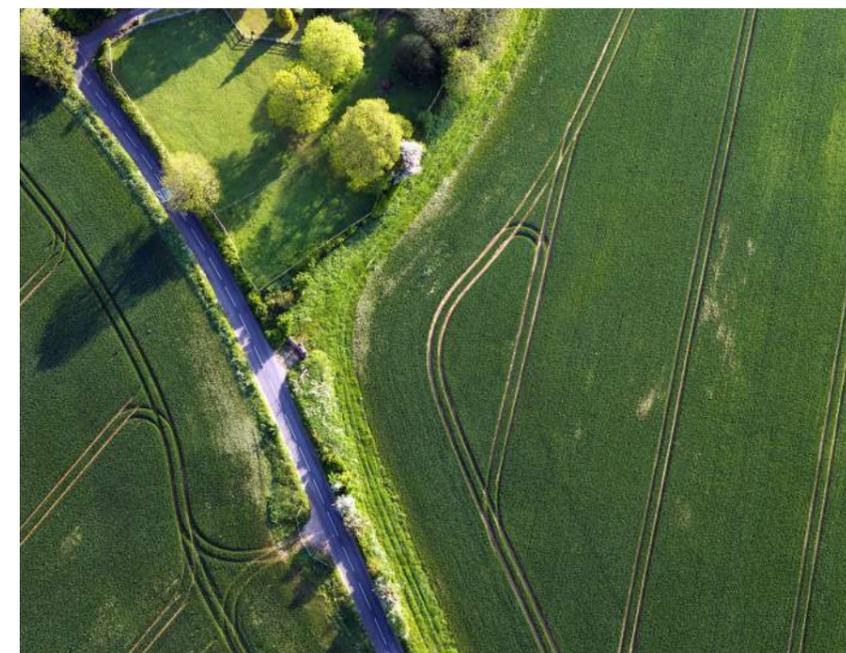
HM Land Registry has been reaching landmarks in land registration since 1862.

In 2018 it passed the milestone of registering 86% of the land mass of England and Wales while laying the groundwork to achieve its aim of comprehensive registration by 2030, a key target for the Government and a core component of its Business Strategy.

The initial priority is to register any publicly-owned land that can be used for housing and development purposes in the areas of greatest housing need by 2020. HM Land Registry then aims to register all the land and property owned by public bodies, local authorities and local councils by the end of 2025.

A comprehensive register will make conveyancing simpler, faster and cheaper as all the information necessary for conveyancing will be in the Land Register, which is online and available to everyone to see.

In the past 12 months, HM Land Registry also made further strides in improving the conveyancing process by launching the digital Local Land Charges Register, which will make the local land charges information of local authorities in England instantly available in a standard, easy-to-read format.



In 2018, the UK Government set up the Geospatial Commission as an impartial expert committee within the Cabinet Office to drive the move to use public and private sector geospatial data more productively. Research estimates that this could contribute up to £11 billion of extra value for the economy every year. HM Land Registry, along with British Geological Survey, Ordnance Survey, Valuation Office Agency, UK Hydrographic Office and Coal Authority, have been identified as Partner Bodies of the Commission as they hold the UK's most valuable location data. Partner bodies are working with the Commission to make the most of the opportunities presented by geospatial data.

Also dedicated to helping buyers and sellers are the start-up companies being mentored through Geovation, HM Land Registry's partnership with Ordnance Survey which is dedicated to supporting open innovation and collaboration using location and property data. The Accelerator Programme has produced a steady pipeline of success since 2015, with 84 start-ups creating more than 200 jobs and raising £23.3 million in investment funding.

Great Britain

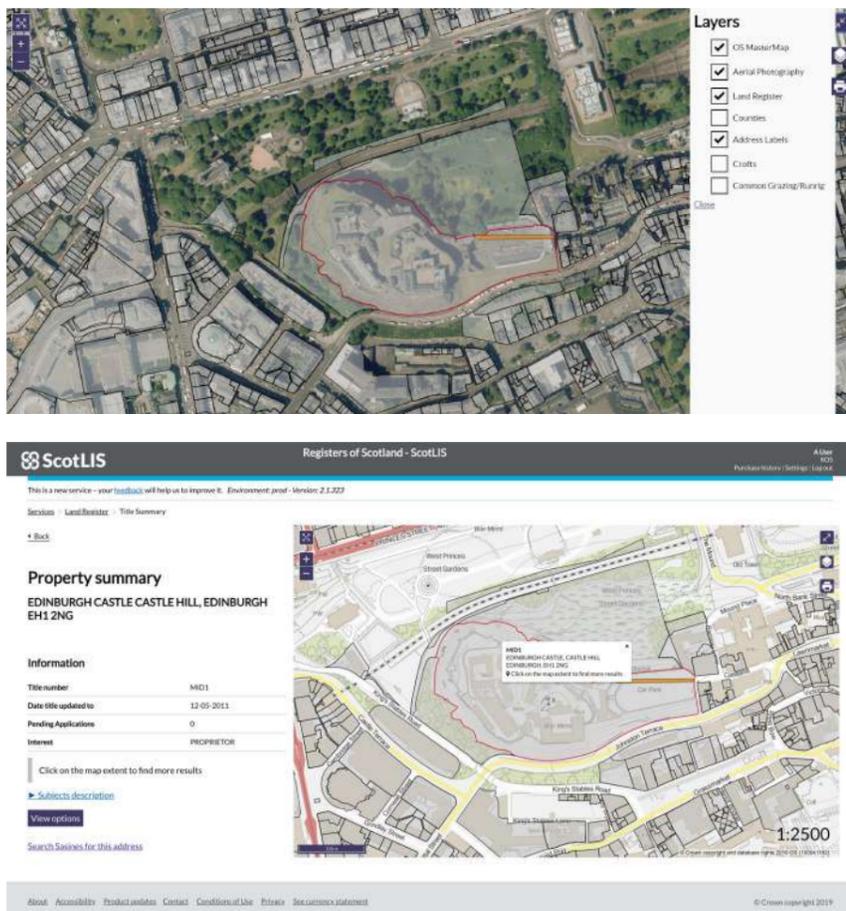
Enabling people to look up information on land and property in Scotland

Scotland's Land Information Service (ScotLIS) is a map-based service that enables people to look up information on land and property.

The service has two offerings: one for the public and an enhanced service aimed at land and property professionals. Prior to ScotLIS, Registers of Scotland (RoS) provided only business access to data, with enquiries from all other groups being handled via the telephone.

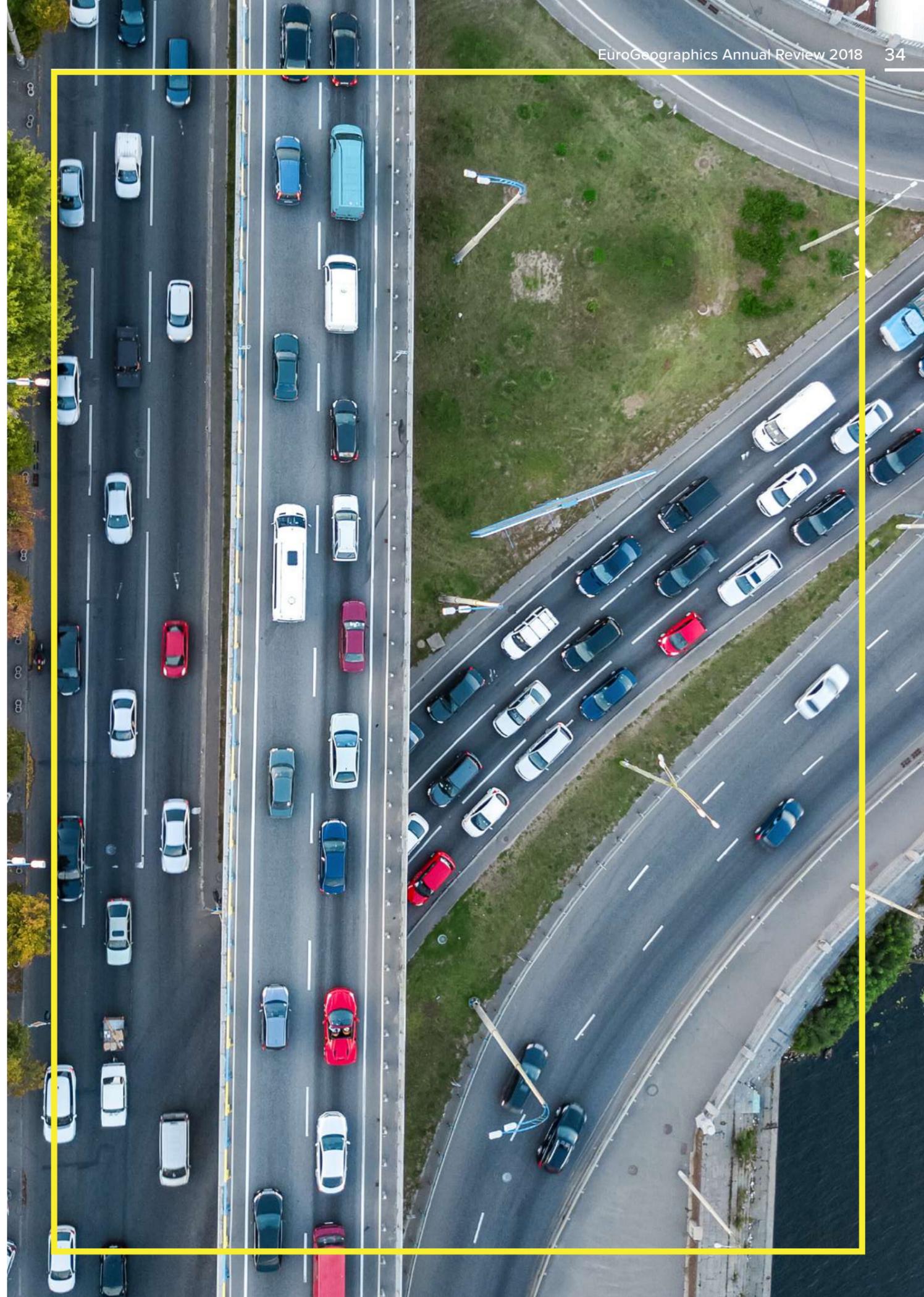
ScotLIS was driven from RoS's ambition to deliver improved digital services and increase the transparency of, and access to, its data. Improving digital services for the public was formally set out in the Scottish Government's Digital First agenda which called for innovative services that were 'high-quality, continually improving and responsive to citizens' needs'. Interest in the transparency of data was also growing within the EU – this became evident through the introduction of the INSPIRE Directive.

Public users can now visit ScotLIS to find out when a property was last sold, historic property prices, whether a property is on the Land Register, its title number and an indication of property boundaries. Land and property professionals can search the Land Register, Sasine Register and Judicial registers and have the ability to purchase title sheets, title plans and search sheets.



ScotLIS has been developed through close collaboration with customers. An early example was workshops held with a wide range of stakeholders including local authorities, searchers, utilities, GIS specialists and solicitors to share knowledge and ideas around what they would need from the service. Customer collaboration continued throughout the development lifecycle, with different iterations of the service shared with customers and then continually refined based on their feedback.

After launch, customers can continue to give feedback through a variety of channels so that improvements can be continually made based on their needs. In 2019 there are bold plans to make data available through an API, and to refresh the public experience around common tasks users wish to undertake, such as finding out ownership information.



Hungary

Supporting nature conservation in Hungary

Mapping provided by the Department of Geodesy, Remote Sensing and Land Offices (BFKH FTFF) in Hungary is supporting a European Union Nature Conservation Strategy Project.

BFKH FTFF (formerly FÖMI) is a key contributor of mapping tasks for the goals in the four development fields of Natura, Ecosystem services, Landscape character and Green infrastructure. The most significant of the thematic maps provided is the first National Ecosystem Map of Hungary, the base layer for which is the land cover layer of the national Land Parcel Identification System (LPIS). Further datasets focusing on various

thematic fields, such as Copernicus HRL 2015 Water and Wetness (WAW), data from the National Forest Information System (ESZIR), were also added.

The Ecosystem Map depicts the country using six main categories with 57 third level classes. Its development has demonstrated new uses of geospatial data with new methodology as well as efficient collaboration between several Hungarian institutes. A further significant project output is a full national radiometrically raw ortho mosaic.

In Hungary, the large majority of surface waters and the totality of subsurface waters are the sole property of the Hungarian State, and their exploitation and all activities leading to qualitative or quantitative changes are subject to authorisation. BFKH FTFF is participating in the Development of the Agricultural Water Usage Information and Control Framework Project which aims to reduce administrative burdens on users by developing a fully electronic process for water usage authorisation.

The system will also provide actual, reliable water usage data for authorities and relevant environmental data for farmers to facilitate irrigation planning. BFKH FTFF's main task is the provision of authoritative geospatial data to underpin the decision support system developed to deliver this for farmers. The data is derived from various sources, including the national cadastral data base, digital elevation model, infrastructure networks and remote sensing. BFKH FTFF has also extended its Geoshop portal to provide a one-stop solution for irrigation investment planning offices to obtain all relevant authoritative geospatial data through a single electronic transaction.

A methodology based on the analysis of Earth Observation has also been developed to enable the separation of irrigated and non-irrigated arable parcels. Surveys based on this methodology are planned for the authoritative control of irrigation, as well as in the development of future irrigation strategies.



Ireland

Ordnance Survey Ireland (OSi) Supporting UN Sustainable Development

The 2030 Agenda for Sustainable Development was adopted by the United Nations (UN) in 2015.

As part of the agenda, the UN General Assembly identified 17 Sustainable Development Goals (SDGs), 169 targets, and 232 global indicators which focus on five key elements; people, planet, peace, prosperity and partnership.

Ireland's Sustainable Development Goals National Implementation Plan 2018-2020 provides a whole-of-government approach to implement the 17 SDGs.

With these goals in mind OSi and the Central Statistics Office (CSO) are collaborating to link geography and statistics to produce indicators that help monitor Ireland's performance towards achieving the 17 SDGs.

The collaboration includes:

- Developing an online GIS-based SDG Hub, for monitoring UN SDGs
- Establishing a joint OSi/CSO working group to develop data visualisation tools
- Developing technical solutions to fulfil Ireland's reporting responsibilities under the UN 2030 agenda for Sustainable Development
- Developing new data dissemination channels
- Promoting the statistical potential of geospatial data



Ireland's SDG Hub (<http://irelandsdg.geohive.ie/>) is an important element of the State's geospatial data hub, GeoHive, which supports collaboration among data producers and users, and facilitates interoperability across a wide range of data and sources.

The SDG Hub is freely accessible to all, and was developed through a partnership between OSi, CSO, and Esri Ireland. Developed and maintained by OSi, it is Ireland's public platform for exploring, downloading and combining publicly available data relating to the UN and the European Union (EU) Sustainable Development Goals. Ireland's progress against each goal is measured using a set of globally and EU agreed indicators and users can search for, discover and visualise the data used to create them.

The Irish Government, through the recently published Public Service Data Strategy 2019 – 2023, recognises the important role that geospatial data plays in the overall government

data ecosystem. It has called on OSi to encourage public sector bodies to catalogue and share geospatial datasets using a common reference, to further develop GeoHive as the State's geospatial data hub and to ensure the appropriate governance structure and best practice methodologies are in place to optimise the State's geospatial data and related resources.

Italy

Italy updates hydrography thematic layer as part of INSPIRE implementation

Revising its hydrography layer according to new technical specifications is enabling the Italian Military Geographic Institute (IMGI) to comply with the INSPIRE Directive.

With the completion of the work in 2018, IMGI has delivered data that meets the latest information requirements and the new technical rules for the 1:25 000 scale Italian geographical databases. The theme was reviewed semi-automatically by linking all available and useful data, and then comparing the results with high-resolution orthophotos collected between 2014 and 2016 (example of workflow in Fig. 1).

As the data was harmonised with a level of detail consistent with the scale target (e.g. Molise region's watercourses in Fig. 2), the layer for hydrography is homogeneous and continuous throughout the whole national territory. The layer is made of 14 selected features that, according to specific criteria of collection, describe the basic hydrography of the Italian territory at a level of detail equivalent to 1:25 000 scale.

The revised layer is now part of the GeoDB together with the other thematic layers.

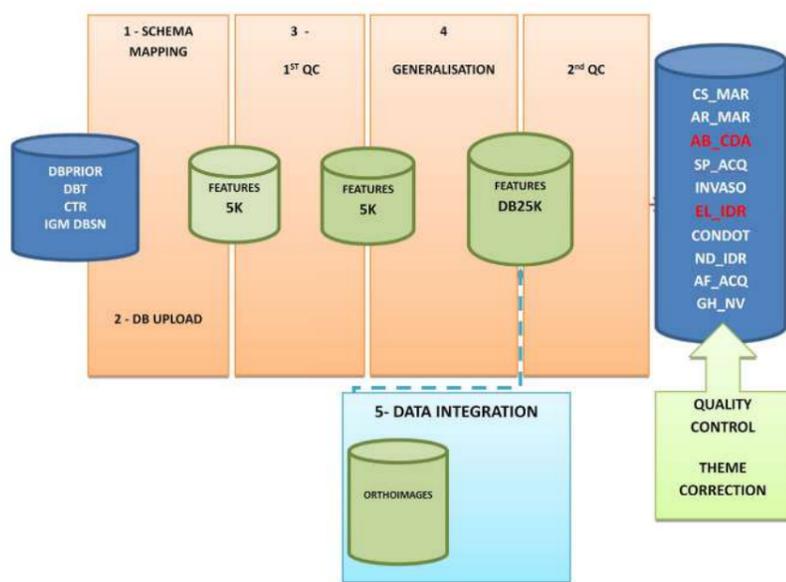


Fig. 1 – Example of workflow

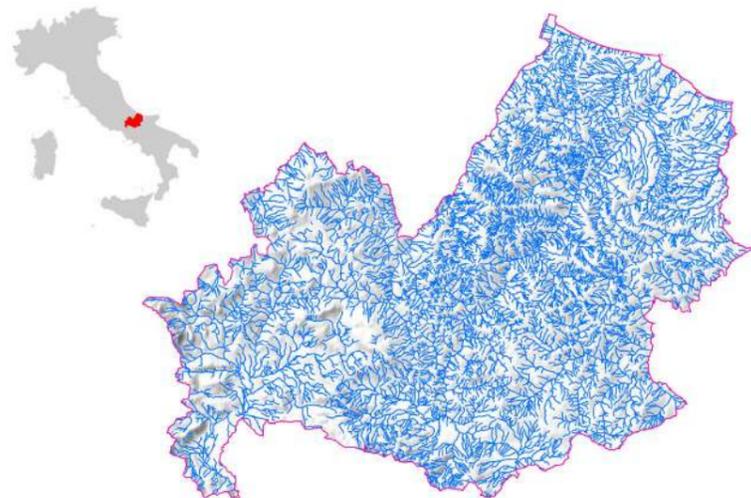


Fig. 2 – Molise region's watercourses

Italy

Demonstrating innovation using online dynamic searches of Italy's cadastral maps

The developments realised by the Italian Revenue Agency (Agenzia delle Entrate) have made it easier to make online dynamic searches for continuously updated cadastral maps.

Citizens, professionals and public administrations will all benefit from this latest initiative which builds on a series of changes to Italian cadastral cartography. These efforts have been instrumental in challenging the view of cadastral maps as shrouded in a cloud of mystery, of little use and accessible only to a few experts.

Today in Italy, cadastral cartography is entirely managed in vector format and, instead of more than 800 local coordinate reference systems (CRS), is available in a single CRS compliant with national and European legislation. The contents of the maps are updated daily through an infrastructure that allows the checking and automatic registration of updated cadastral deeds drawn up by the technical professionals. Every day nearly 1,500 cadastral map updates, involving about 3,000 parcels, are recorded.

As part of on-going projects to improve the quality of the cartographic database and within the framework

of the implementation of the INSPIRE Directive, Italian cadastral cartography is shown worldwide through both a WMS standard-based view service and a new purpose-built website, the Cadastral Cartographic Geoportal. A couple of clicks on the Internet are enough to display maps and dynamically surf through parcels, buildings, waters and streets, enabling anyone to easily search and view every real estate in the entire national territory.

The goal is to make cadastral cartography a fully-fledged infrastructure of the country, capable of effectively supporting spatial decision-making processes and promptly integrating with other geographic data. Users can observe the evolution of the Agency's cartographic database day by day through the new service that marks an important milestone towards greater transparency in its updating and improvement processes.

Cadastral Cartographic Geoportal



Website section 'Explore the map'

Mobile version

Lithuania

Lithuania starts development of 3D Cadastre

In Lithuania, the State Enterprise Centre of Registers (SECR) has initiated a research and development project to build pilot technology for preparing, storing and managing spatial 3D data.

The pilot marks the first step in developing a 3D cadastre with national coverage and the project will be completed in 2021.

The outcomes, which will help implement initiatives for economic developments, are expected to enable the integration of a wide range of information. This includes up-to-date spatial data, data collected and stored in the Real Property Register as well as other relevant cadastral registers and information systems (such as Register of Subsoil, Register of Territorial Planning Documents, topographical plans and engineering network plans maintained by municipalities) and spatial data created in Building Information Modelling (BIM) processes.

Created and maintained 3D models will be available on the Internet through the Regional Geographic Information Environment Service REGIA (www.regia.lt) for viewing, analysing and integrated use. Together with the advanced e-services developed during the project, these provide vital tools for citizens taking part in state governance, dealing with real property investments, planning their trips, travelling and searching for various information.

Representatives of government institutions, national or local strategy developers, public security officers and others will also use the up-to-date 3D data for decision-making, analysis, modelling and efficient planning. For businesses, the 3D data opens new opportunities to become more competitive, precise and faster. The technology will also be relevant to investors, professionals from various fields such as architecture, land management, urban planning and development, and real estate.

SECR is the keeper of the main state registers, as well as the main provider of data-based public e-services in Lithuania. Its primary function is the administration of the 11 main state registers and 11 information systems.



Fig. 1 – 3D data model and BIM integration



Fig. 2 – Point Cloud

Moldova

Delivering new large-scale digital map of Moldova

Collaboration between the Agency for Land Relations and Cadastre (ALRC) and Norway is delivering vital geographic information for the Moldovian National Spatial Data Infrastructure (NSDI).

Since 2006 the Norwegian government, through the Norwegian Mapping Authority, has assisted the ALRC by funding orthophotos, a nationwide GNSS positioning system (MoldPOS), Digital Terrain Model and, more recently large-scale vector maps. All play a key role in the implementation of the NSDI.

During 2018, the ALRC, through its State Enterprise INGEOCAD, continued to produce high quality 1:5 000 scale vector maps. The aim is that Moldova will be the first country in Eastern Europe to have complete coverage of large-scale topographic maps. These will

be especially useful for enhancing the quality of cadastral maps, which will be funded by a World Bank loan. The maps are available via <https://www.moldova-map.md/>.

The INSPIRE Directive was transposed into Moldavian legislation by means of a law on National Spatial Data Infrastructure adopted by the Parliament of Moldova in November 2016. As part of this on-going implementation, NSDI services from the ALRC can be accessed through <http://www.geoportalinds.gov.md/>. To date, 38 datasets and 19 spatial data services are described with metadata.

As a result of the Open Government Partnership Initiative, the Moldavian government has also implemented an open data portal at www.date.gov.md for government institutions to publish their datasets. The objective is to use advanced information technologies to increase public access to information, promote transparency and ensure citizens' participation in public matters.



Northern Ireland

Supporting parliamentary representation for Northern Ireland with official mapping

Detailed, comprehensive official mapping from OSNI, part of Land and Property Services within the Department of Finance, is supporting the review of parliamentary constituencies in Northern Ireland.

OSNI has implemented a Geographic Information System (GIS) solution and provided on-going mapping support

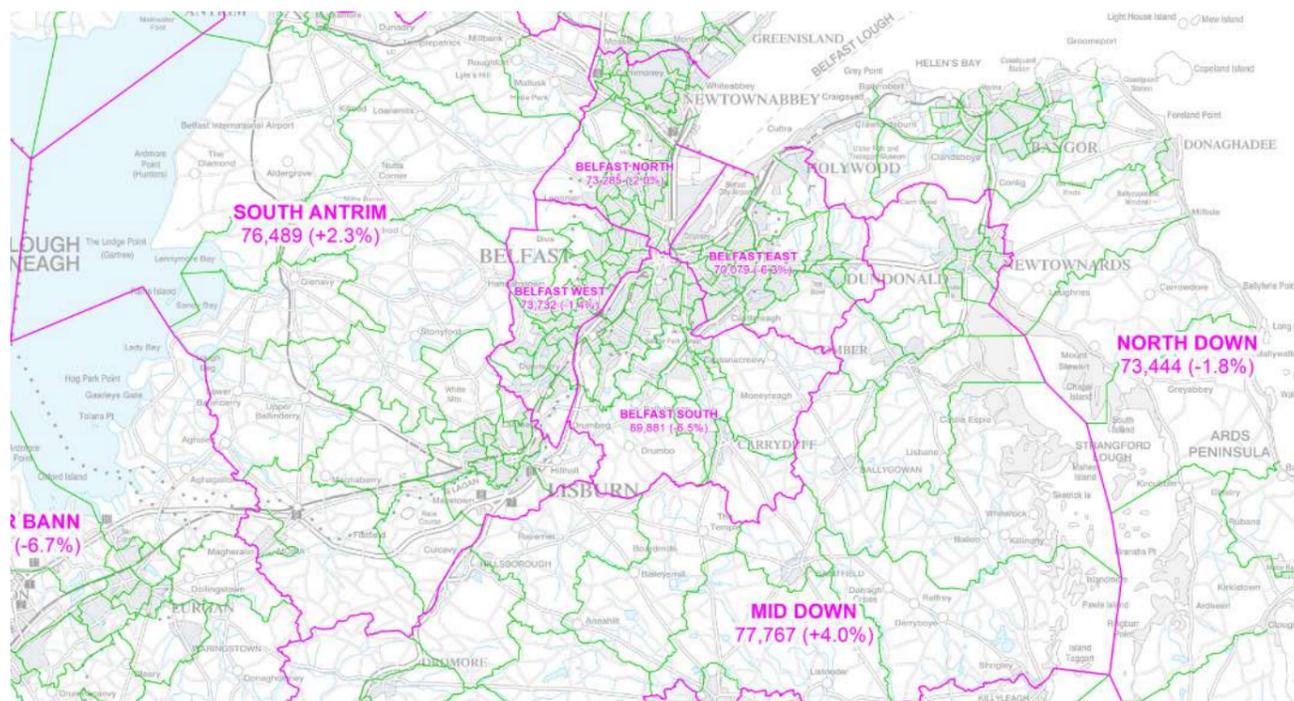
to The Boundary Commission for Northern Ireland's (BCNI) task to develop provisional proposals for the 2018 Review of Parliamentary constituency boundaries.

In accordance with the Parliamentary Constituencies Act 1986, as amended by the Parliamentary Voting System and Constituencies Act 2011, the number of parliamentary constituencies across the UK will reduce to 600 in total, and from 18 to 17 in Northern Ireland. These new boundaries will be used to elect politicians to The Northern Ireland Assembly and UK Parliament.

OSNI out-posted GI support staff collaborated with BCNI and developed a GIS-based solution which resulted in a significant improvement in the accuracy of the proposals compared

with past processes. Not only has this removed the need to use paper maps and spreadsheets, it has also created significant financial, staffing and time savings.

The web application created to display BCNI's final recommendations provided an accessible platform for users to access the data for this review. This benefits both government officials and other stakeholders responsible for developing the constituency boundaries and, more importantly, the citizens of Northern Ireland who will all be affected by these changes. The resulting New Parliamentary Boundary Map better reflects the current demographics, which ultimately leads to fairer representation in the UK Parliament.



Norway

Norway launches new land registration system for professional users

The Norwegian Mapping Authority has developed a new land registration system for professional users.

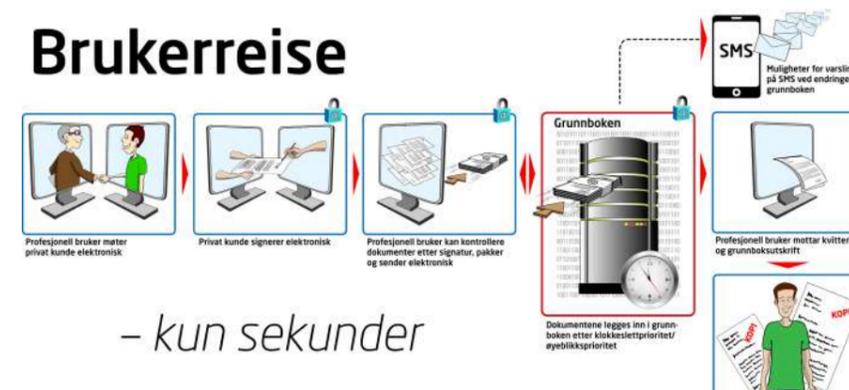
The system is built on a fully automated process, in which documents that meet the requirements for registration can be registered automatically and given immediate priority in the Land Registry.

The target group for the system is professional users such as real estate agents and banks. The system facilitates electronic communication between users and the land registration authority and contributes to the faster payment of loans and property transfers whilst shortening periods between funding. It is also delivering savings in postage.

Electronic document control takes place before signature with feedback and proceedings taking only seconds. Paper document control is before submission with feedback and proceedings completed within two days.

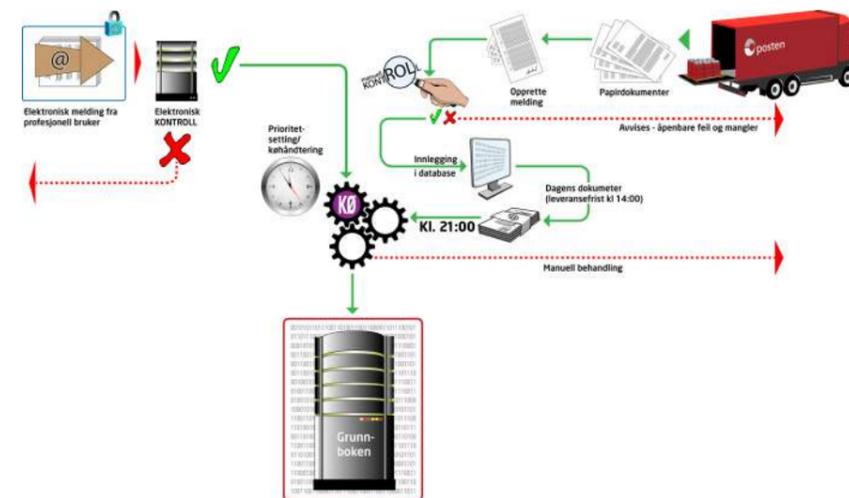
As a result of the new system, submissions have been of a higher quality and fewer documents returned. In 2018 there were 1,601,576 registrations in the land register of which 38% were submitted electronically and 99.7% meet quality standards.

Brukerreise



– kun sekunder

E-registration – example of user journey



E-registration – electronic flow vs paper

Poland

Providing user-friendly services through the national geoportal in Poland

Poland's Head Office of Geodesy and Cartography (GUGiK) is delivering user-friendly services for public administration, business, academics and citizens via the national geoportal.

In 2019, dedicated map applications were added to <http://geoportal.gov.pl> to provide new open data with 10 million 3D building models in standard LoD2 for two thirds of the country. These were created in a CAPAP (Center for Spatial Analysis of Public Administration) project and compiled from three data sources:

- Contours of 2D buildings from the database of topographic objects (BDOT10k);
- Altitude data obtained from ALS; and
- High-resolution DTM (mesh 1m).

New online services from many public authorities cooperating with GUGiK, including Polish Railway Lines, the Institute of Meteorology and Water Management, the Ministry of Health and the National Heritage Institute, were also launched. As a result, users can check the weather information, view data on UNESCO objects and historical and archaeological monuments (as set out in the INSPIRE Directive), and see information about national railway locations.

Furthermore, it is now also possible to click on the parcel identifier in the Land and Property Register and be redirected to the geoportal.gov.pl where the view provided is cropped to the parcel. This new functionality is available through GUGiK's cooperation with the Ministry of Justice and enables users to see the location and surroundings of the parcel in the geoportal, offering the possibility to analyse it using orthophotos, streets and addresses and other layers, such as the map of protected areas or flood hazard areas. Users can also benefit from a spatial analysis based on up-to-date information collected in the central part of national geodetic and cartographic resource.

The national geoportal is available in 11 languages and a good example of the integration of data and services from many sources to demonstrate new use cases for geospatial data.



Portugal

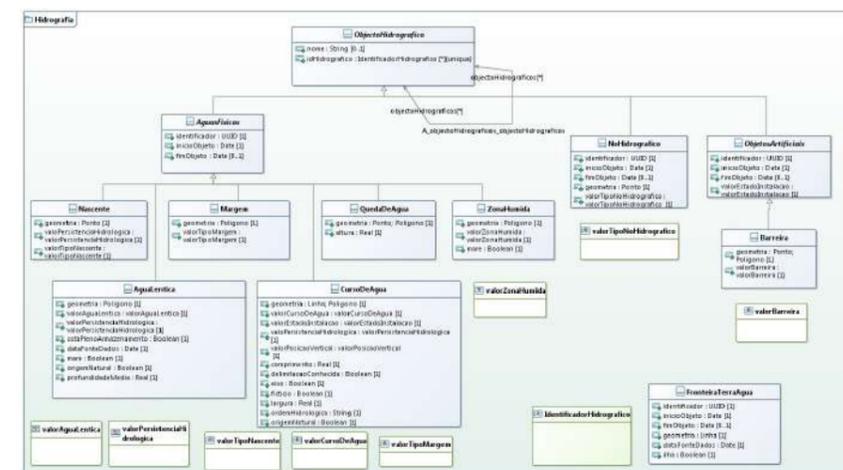
Defining new technical specifications for Portuguese reference cartography

Directorate-General for the Territory (DGT) is responsible for defining technical specifications for Portuguese reference cartography and has delivered enhancements to meet three main objectives.

These include aligning cartographic production technical specifications to the technological developments which have significantly changed the way users explore spatial data. DGT has also developed new ways to better connect the technical specifications for Portuguese reference cartography production with the INSPIRE rules and specifications to simplify data harmonisation procedures. Finally, the work will contribute to a better implementation of the Cartographic National Database.

The INSPIRE themes considered relevant for creating the new technical specifications were: Geographical Names, Transport Networks, Hydrography, Elevation, Land Cover, Buildings, Production, Industrial Facilities and Utility, Governmental Services and Orthoimagery.

A working group composed of several technicians with complementary skills was established to restructure the



UML Class diagram: Hydrography Theme

technical specifications for cartographic production. The process also included input from external experts from the central and local public administration, the private sector and the academy. This wide-ranging participation was designed to produce specifications which meet the many demands arising from multiple uses of spatial data.

The first draft was available for public consultation and was also analysed and approved by the organisations that coordinate the Portuguese National Spatial Data Infrastructure. It was also presented to the Portuguese Local Public Administration through several public events attended by more than 500 people.

The data model of these technical specifications was implemented using a database PostgreSQL/PostGIS and includes data for two levels of detail, level 1 for cartography in urban areas and level 2 for cartography for the



Portuguese reference cartography: Layout example for some data themes

whole territory. These new technical specifications will be tested in a real-life production environment through several case studies developed in collaboration with private companies.

It is expected that the new technical specifications for base geodata acquisition will meet the needs of the different users, and, in this way, will contribute to a more widespread use of Portuguese spatial data. The next steps will include capacity building and awareness sessions for the user community, namely for local government technical resources, which are the major users of spatial data.

Romania

Delivering government priorities for real estate registration in Romania

In Romania, the government's priority of delivering the systematic registration of all real estate properties at national level is being implemented by the National Agency for Cadastre and Land Registration (ANCP).

The National Cadastre and Land Book Program 2015-2023 benefits the Romanian state, citizens and investors, and represents an important investment in the digital infrastructure at national level with major macro-economic implications. From a financial and legislative point of view, the achievement of cadastre also supports sustainable development objectives.

In recognition of the importance, scale and, in particular the targeted results, ANCP has signed a contract to finance a major project using European structural and investment funds. "Increasing the coverage and inclusion of the property registration system in rural areas in Romania" under Priority Axis 11 of the Regional Operational Program 2014-2020 will enable the free registration of all real estate properties at national level, including those belonging to the public and private domain of the state and of the administrative-territorial units (ATUs), in the integrated cadastre and land registration system. An additional benefit is the accelerated pace of systematic registration at national level.



Systematic registration works have been completed in 59 ATUs from a total of 3,181 and in cadastral sectors, representing a total area of 801 315 ha. Ongoing systematic registration is taking place for 2,398 ATUs in an estimated area of 5 026 192 ha.

To achieve this objective, ANCP has developed and permanently upgraded the IT system "eTerra" used to manage the information on real estate and landowners resulting from on-demand and systematic registration. This provides effective access to the computer platform and online services for traditional customers (notaries, cadastre, judicial experts) as well as other public authorities and institutions. It also enables provision of information from land book extracts available through the e-payment platform (<http://epay.ancpi.ro>) which is recognised by all institutions of local and central government such as banks, lawyers and notaries.

Slovak Republic

Reducing bureaucracy in Slovakia using the once-only principle for administration

Under the act against bureaucracy, public authorities in Slovakia must use data registered in public administration information systems, as well as provide it to each other free of charge for reuse.

The Over.si (to.Verify) project, launched in September 2018, demonstrates a practical implementation of this principle by enabling citizens, businesses and institutions to provide certain standard information to public authorities once only.

The Over.si user portal provides data through the Information System of Central Administration of Reference Data (IS CSRU). This information system ensures synchronisation of reference data and provision of data from reference registers and basic code lists in a uniform way.

The Geodesy, Cartography and Cadastre Authority of the Slovak Republic (UGKK SR) is the central authority for geodesy, cadastre and land registry in Slovakia. As part of the Over.si project, it has integrated the Information System of Real Estate Cadastre (ISKN) with IS CSRU to provide the data most requested by public authorities, such as ownership document extracts and copies of cadastral maps. Since the launch of the project, more than 26,000 ownership document extracts and about 1,500 copies from the cadastral map have been requested from the Over.si portal.

Over.si also supports European Union plans to further develop the single digital market by reducing the administrative burden on citizens and businesses, saving money and time. For example, people no longer have to bring statements from the business, trade or criminal record registers to the authorities and, in the near future this will expand to include confirmation of school attendance, arrears on social and health insurance and taxes.



Podporovaná vizualizácia pre Internet Explorer je 11 0.00 a vyššie.



Prihlásenie pomocou e-mailu a hesla

Prosím zadajte Vaše e-mail a heslo pre prihlásenie sa do portálu.

E-mail *

Heslo *

Prihlásenie pomocou eID

Prihlásenie pomocou eID. Po kliknutí na tlačítko budete presmerovaný na slovensko.sk, kde sa prihlásite pomocou Vašho občianskeho preukazu a BOKU. Pre prihlásenie je

Slovenia

Linking Slovenia to Europe through a new coordinate system

Transforming its national datasets using a new horizontal coordinate system (D96/TM) has enabled Slovenia to link this fundamental spatial information to the rest of Europe.

The work, completed by the Surveying and Mapping Authority of the Republic of Slovenia, improves accuracy and transparency. By simplifying access to spatial data and its reuse, it also facilitates regional development, preparation and enactment of pan-European policies, environmental protection and the development of new software solutions and applications for the wider public.

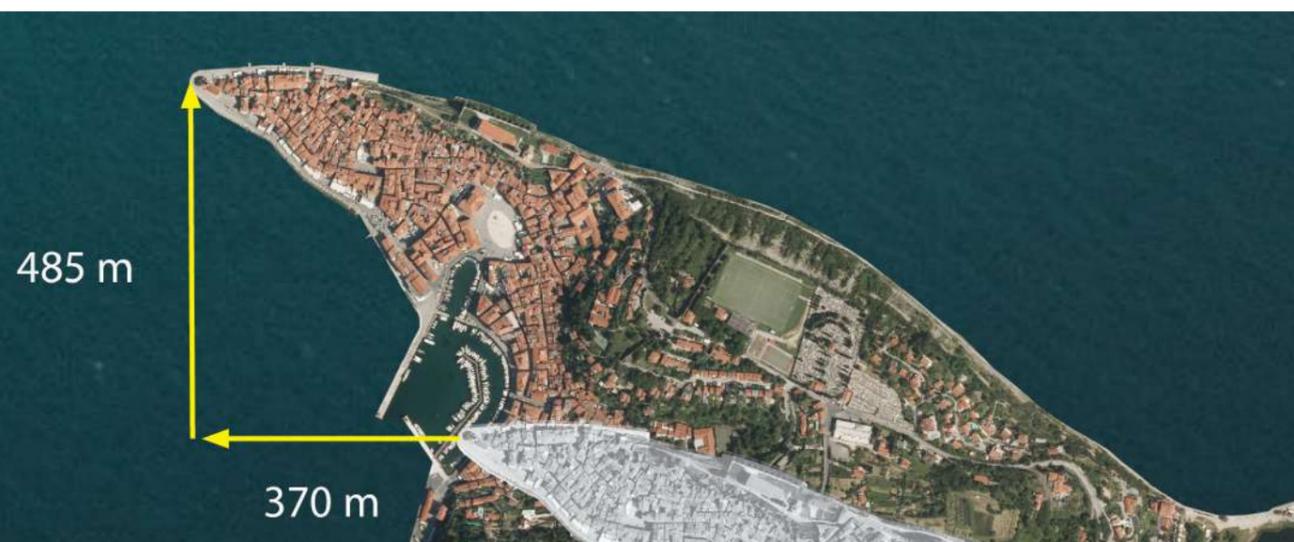
Surveying and acquisition of real time location data in the new coordinate system with an accuracy of a few centimeters was achieved by establishing the network of permanent GNSS stations – SIGNAL. This enables surveyed coordinates in Slovenia to be directly linked with surveyed coordinates from other European countries.

The SIGNAL network currently consists of 16 evenly positioned GNSS stations which are no more than 70 km apart. Each contains receivers for continuous surveying all year round and the results are monitored at the control centre in Ljubljana.

The name D96/TM represents the components of the coordinate system: The geodetic datum (1996) and the projection (Transverse Mercator projection). Prior to its use, a spatial data transformation model also had to be established. This included testing the feasibility and usability of the

transformation model for individual spatial datasets, preparing a spatial dataset transformation roadmap and designing software solutions for spatial dataset transformation for other spatial data providers.

D96/TM was enacted by law in 2014 and marks the conclusion of activities which first began in 1994 through participation in an international survey to determine spatial coordinates with the use of new technologies. In 2004, the national strategy of the geodetic reference system was adopted, detailing activities needed to implement the new coordinate system and spatial data transformation from the old into the new, current coordinate system.



Spain

Implementing strategy to meet the needs of digital society in Spain

Spain's General Directorate for the Cadastre is implementing a new strategy to meet demand for territorial information in a digital society.

It has developed new tools and processes to deliver seven strategic objectives. In addition to systematically implementing the strategic plan, the goals also focus on transforming the organisation to achieve full digital management, as well as on the quality and provision of data through continuous updating, consistent valuation, improved cartography and strengthened relationships with notaries and properties registers.

To encourage administrations and citizens to provide cadastral information, the Cadastre has simplified its notification process. This means people can fulfil their obligations using tools that enable draft declarations, provide an assistant for the declaration and a single model of declaration.

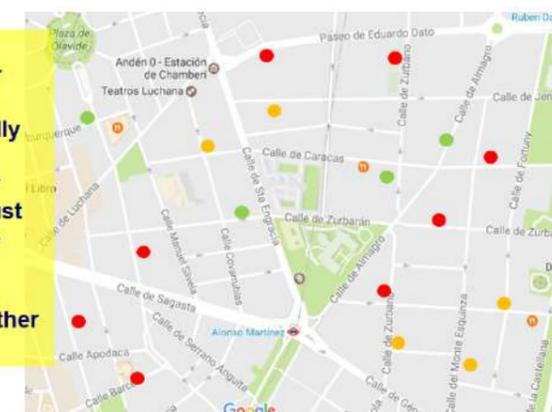
To implement its collaborative strategy, the Cadastre has developed a new IT system, the Management Map, which allows monitoring and the capture of information about alterations in the territory to plan and control the flow of work.



➤ Some communications or declarations are treated automatically

➤ Other require other documents that must be provided by the collaborators

➤ Others must be further investigated



Documents, such as building plans, licence grants or certificates given by the municipality at the end of construction, will be automatically incorporated in an standard and interoperable way using the tools and model implemented by the Government of Spain to interconnect the registers of the public administrations.

The Management Map will also determine which type of cadastral record (for example, new construction, segregation, division, change of crop) and what information each record must contain. Once the system has detected that the information is complete, this will become a categorized registry file for subsequent processing.

Sweden

Nordic collaboration helps harmonise cross-border data

Strategic collaboration between the Nordic mapping agencies is being realised through a number of defined common working groups.

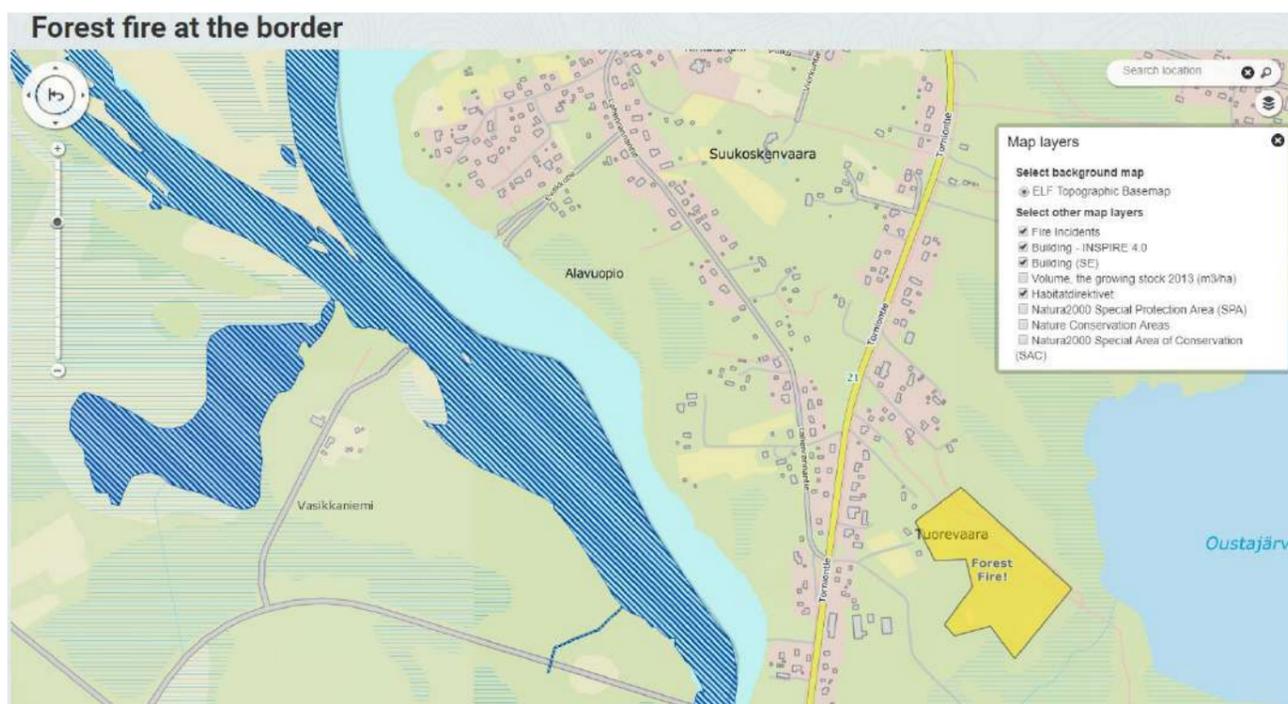
The Land Mapping Group, which focuses on topographic mapping, products and the dissemination of geodata, is chaired by Anders Sandin from The Swedish Mapping, Cadastral and Land Registration Authority. This work is complemented by the activities of the KrisGIS Group, which includes representatives from the different national civil contingences, the police organizations and the alarm centrals, is promoting developed geodata support for cross-border emergency response and is chaired by Johan Linjer from The Swedish Mapping, Cadastral and Land Registration Authority.

Collaboration between the two working groups is designed to develop a common understanding for the need for improved cross-border geodata

solutions to support all actors involved in emergency response. The project, called Harmonised Cross Border Data, was carried out during 2017/2018.

Three use cases and the important information needed to handle each crisis scenario were defined by the KrisGIS Group. These were an animal epidemic (affecting Denmark and Sweden); a forest fire (affecting Finland and Sweden); and a search and rescue operation (affecting Finland, Norway and Sweden).

The Land Mapping Group established whether the requested data was available in each country and, if so, how it could be presented in a common map service. For the map service, the Land Mapping Group prepared map clients based on the European Location Service.



Switzerland

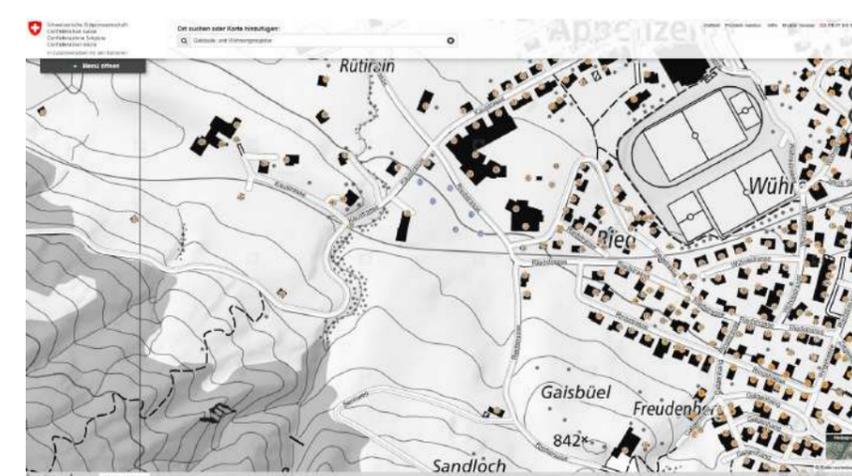
Launching Switzerland's official street and building address databases

Free, comprehensive and up-to-date official street and building address registers are being provided to the public in Switzerland by swisstopo, the Federal Office of Topography.

Implementation began in 2018 and the registers will be completed in 2019.

Previously, Switzerland, unlike the majority of European countries, did not have an official address register. A growing need for geodata, however has made such a register necessary, particularly for administrative tasks. Two federal ordinances, which came into force in July 2017, give the Confederation the responsibility to provide an official street register and an official building address register.

The data come primarily from the Federal Register of Buildings and Dwellings (RBD) of the Federal Statistical Office, which is used mainly for statistical purposes. To enable integration of street geometry and address geo-referencing, this is supplemented with cadastral surveying data provided by swisstopo. Ownership and responsibility for the information remains with the respective owners; the municipalities for RBD data and the cantons for cadastral surveying data.



The use of both directories is free and open to the public. Business and individuals can use it to build commercial address directories and to integrate it into cartographic applications or web services. Both registers are binding on the authorities.

The content of the registers is continuously updated with new information by a municipality being

incorporated into the official register within a day of entry. Full coverage of Switzerland is planned for mid-2019. The register data will be accessible via direct download as well as through web services.

Turkey

Spatial data users in Turkey benefit from new applications

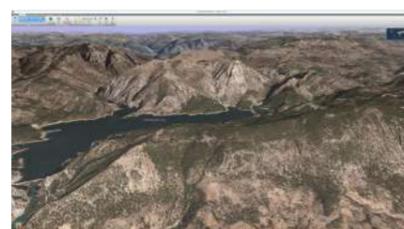
Two new applications developed by General Directorate of Mapping (GDM) are delivering a wide range of spatial data to users in Turkey.

GDM Sphere is completely free to use and represents the Earth as a three-dimensional globe to deliver geographic data over the Internet. The desktop application serves satellite imagery and aerial photos, thematic maps, vector data such as transportation network and live meteorological data. It also provides users with Geo names, Points of Interest (POIs), 3D Buildings and other geographic information.

A Windows operating system is needed to use GDM Sphere which is also available as an Android mobile application.

GDM Atlas is a 2D web map application offering aerial photographs, street maps with different themes, route planning, geocoding services and some other applications. Users are also able to view recent earthquakes and instant meteorological conditions. Future additions include historical aerial photos from 1930 to the present day.

GDM Atlas is accessed via <https://atlas.harita.gov.tr/>. It is mobile compatible and a new version with mobile application and navigation ability will be released soon.



Ukraine

Implementing initiatives for a data society in Ukraine

In Ukraine, the State Service for Geodesy, Cartography and Cadastre (StateGeoCadastre) is implementing initiatives, including National Spatial Data Infrastructure (NSDI), land valuations and Blockchain, to support a data society.

At an international conference in Kyiv in February 2018, StateGeoCadastre presented the NSDI prototype for the pilot territory as a result of a project funded by the Japan International Cooperation Agency (JICA). The geoportal is available online at www.nsdil.land.gov.ua. During the event, delegates from UN-GGIM:Europe, EuroGeographics, and representatives from 15 National Mapping, Cadastral and Land Registration Authorities worldwide discussed best practice in NSDI approaches and achievements.

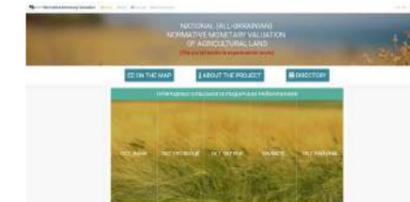
In 2018, StateGeoCadastre also completed the national valuation of 35 million hectares of agricultural land and published this information online at www.ngo.land.gov.ua. The portal contains complete georeferenced information on soils and enables users to calculate the normative value of any agricultural plot or



group of parcels, as well as to request the official extract on normative land valuation.

Electronic land auctions for state-owned agricultural lands using Blockchain are not only improving transparency but also aim to increase interest in leasing them. Realising land auctions through two online services – www.land.setam.net.ua and www.prozorro.sale – has demonstrated the significant income available to local budgets from the land tax and increases the land lease rate which is beneficial for the state. StateGeoCadastre has concluded agreements with the most popular online platforms to conduct e-auctions using Blockchain technology, so that all participants and observers can check each auction step and verify the winner.

International cooperation remains a key focus and the First Deputy Chairman of StateGeoCadastre, Liudmyla Shemelynets was elected to EuroGeographics Management Board in 2018. In addition, StateGeoCadastre continues its cooperation with Kartverket to create a 1:50 000 scale digital



base map and to develop the GNSS network. The World Bank and the EU are supporting Ukraine in implementing land reform, increasing transparency in land governance, introducing land relations monitoring and in developing an inventory of lands and remote sensing.

LIST OF MEMBERS

ALBANIA

State Authority for Geospatial Information

ALBANIA

Central Office of Immovable Property Registration

ARMENIA

Real Estate Cadastre Committee of the Republic of Armenia

AUSTRIA

Federal Office of Metrology and Surveying

AZERBAIJAN

Real Estate Cadastre and Address Registry Service under the State Committee on Property Issues, the Republic of Azerbaijan

BELARUS

State Committee on Property of the Republic of Belarus

BELGIUM

National Geographic Institute

BELGIUM

General Administration of Patrimonial Documentation

BOSNIA & HERZEGOVINA

Federal Administration for Geodetic and Real Property Affairs

BOSNIA & HERZEGOVINA REPUBLIC OF SRPSKA

Republic Authority for Geodetic and Property Affairs of Republic of Srpska

BULGARIA

Geodesy, Cartography and Cadastre Agency

CROATIA

State Geodetic Administration of the Republic of Croatia

CYPRUS

Cyprus Department of Lands and Surveys

CZECH REP

Czech Office for Surveying, Mapping and Cadastre

DENMARK

Danish Geodata Agency

DENMARK

Agency for Data Supply and Efficiency

ESTONIA

Estonian Land Board

FINLAND

National Land Survey of Finland

FRANCE

National Institute of Geographic and Forest Information

GEORGIA

National Agency of Public Registry

GERMANY

Federal Agency for Cartography and Geodesy

GERMANY

Working Committee of the Surveying Authorities of the Laender of the Federal Republic of Germany

GREAT BRITAIN

Ordnance Survey

GREAT BRITAIN

Her Majesty's Land Registry

GREAT BRITAIN

Registers of Scotland

GREECE

Hellenic Military Geographical Service

GREECE

Hellenic Cadastre

HUNGARY

Department of Geodesy, Remote Sensing and Land Offices

HUNGARY

Geoinformation Service of Hungarian Defence Forces

ICELAND

National Land Survey of Iceland

ICELAND

Registers Iceland

IRELAND

Ordnance Survey Ireland

ITALY

Italian Military Geographic Institute

ITALY

Revenue Agency

KOSOVO

Kosovo Cadastral Agency

LATVIA

The State Land Service

LATVIA

Latvian Geospatial Information Agency

LITHUANIA

National Land Service under the Ministry of Agriculture

LITHUANIA

State Enterprise Centre of Registers

LUXEMBOURG

Administration of the Cadastre and Topography

MALTA

Malta Planning Authority

MALTA

Malta Land Registry

MOLDOVA

Agency for Land Relations and Cadastre of the Republic of Moldova

MONTENEGRO

Real Estate Administration of Montenegro

NORTHERN IRELAND

Land and Property Services

NORWAY

Norwegian Mapping Authority

POLAND

Head Office of Geodesy and Cartography

PORTUGAL

Directorate General for Territory

REPUBLIC OF NORTH MACEDONIA

Agency for Real Estate Cadastre

ROMANIA

National Agency for Cadastre and Land Registration of Romania

RUSSIA

Federal Service for State Registration, Cadastre and Cartography

SERBIA

Republic Geodetic Authority

SLOVAK REPUBLIC

Geodesy, Cartography and Cadastre Authority of the Slovak Republic

SLOVENIA

Surveying and Mapping Authority of the Republic of Slovenia

SPAIN

National Geographic Institute of Spain

SPAIN

General Directorate for the Cadastre

SPAIN

Territorial Commission of the Geographic High Council

SWEDEN

The Swedish Mapping, Cadastral and Land Registration Authority

SWITZERLAND

Federal Office of Topography

THE NETHERLANDS

Cadastre, Land Registry and Mapping Agency

TURKEY

General Command of Mapping

TURKEY

General Directorate of Land Registry and Cadastre

UKRAINE

State Service of Ukraine for Geodesy, Cartography and Cadastre



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Alina Talipova

Office Manager

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Helen Kaestner

European Location Services Transition
Programme Manager

Abigail Page

Technical Product Development Manager

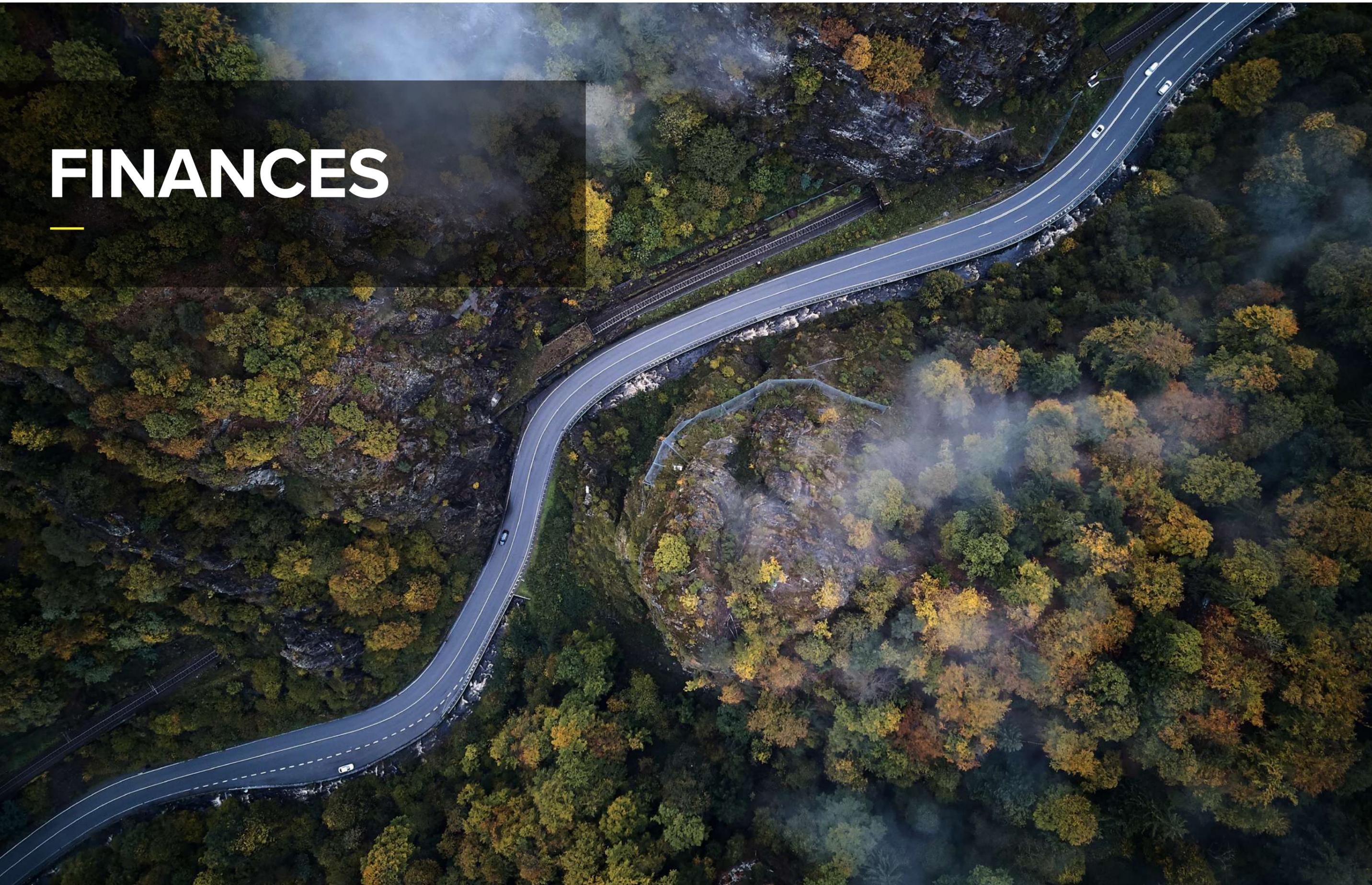
Jari Reini

Technology Manager

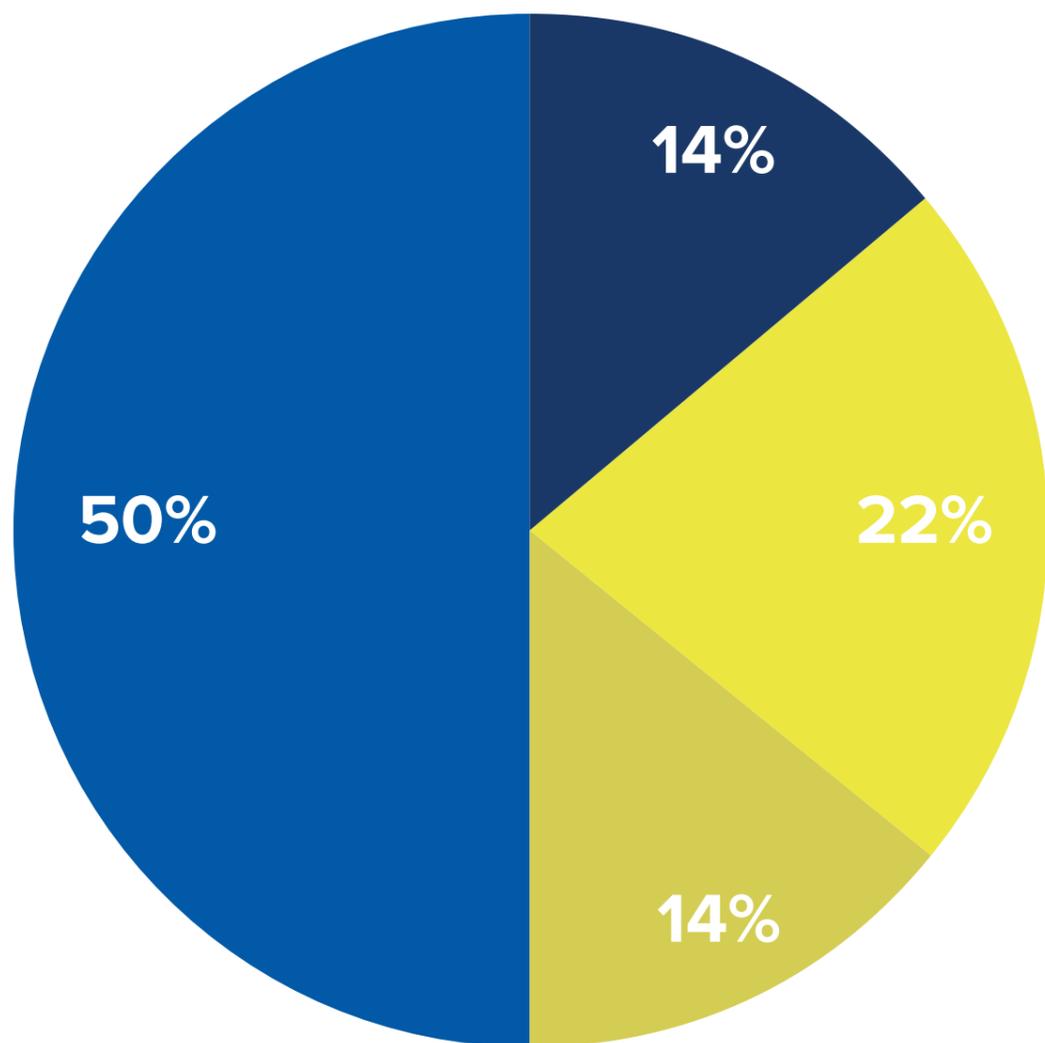
Saulius Urbanas

Services Development Consultant

FINANCES

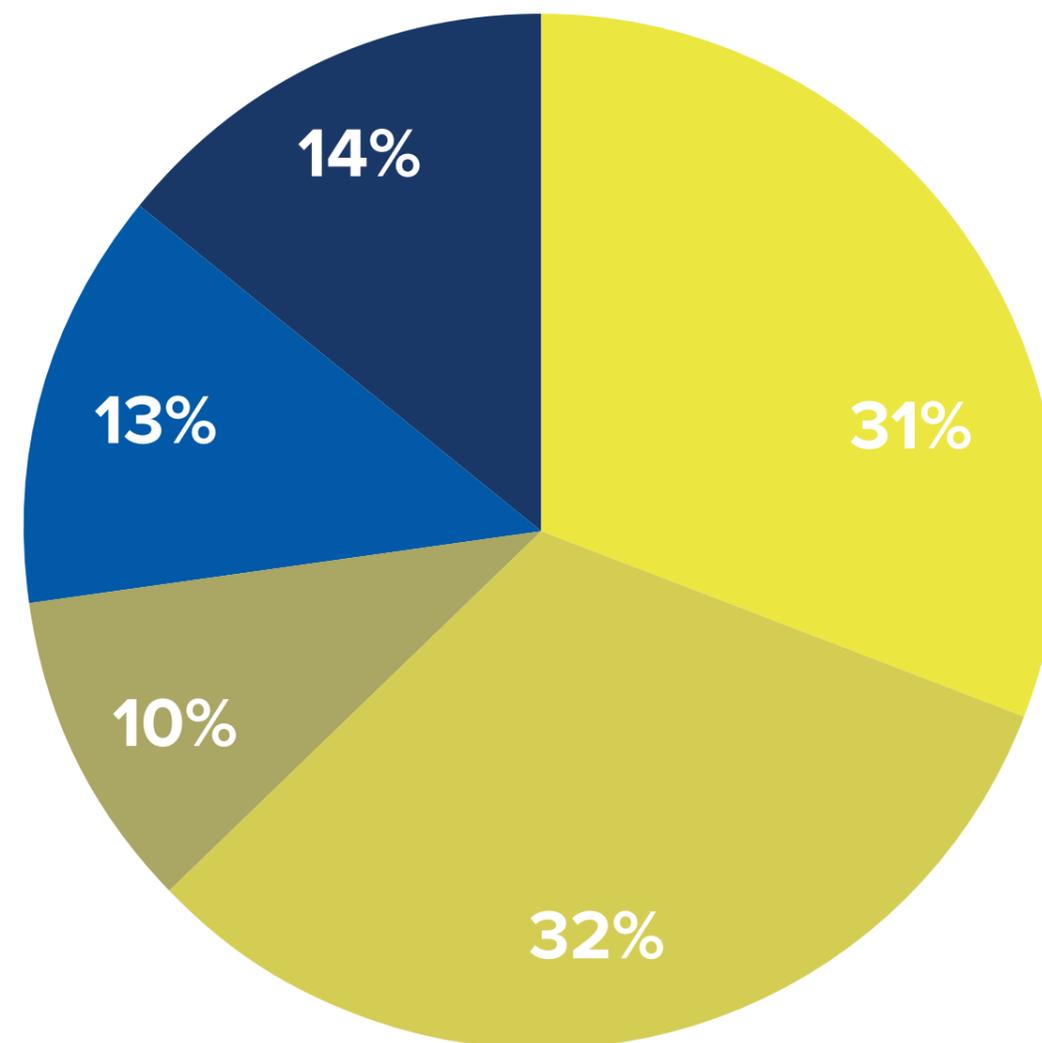


INCOME



- Eurostat
- Sales Licences
- Membership Subscriptions
- EC Grant

EXPENDITURE



Total Expenditure €2.08 million

- Project
- Labour & Taxes
- Meeting & Travel Expenses
- Other Operations Costs
- Product Costs